<div align="center">

Hod Lipson, Ph. D.
Professor of Engineering and Data Science, Columbia University, NYC
Machine Learning, Data Science, Robotics

Curriculum Vitae
(Updated April 2023)

</div>

Current Address:	Columbia University, Mudd 220
	500 W. 120th St., New York, NY 10027 USA
	+1 (607) 592-4383
E-Mail	hod.lipson@columbia.edu
Web	https://www.hodlipson.com/
Scholar	https://scholar.google.com/citations?user=F_Go4V4AAAAJ

Citations per year:

Key academic metrics

Citations	43,285
H-Factor	86
Publications:	361
Invited Talks	505
PhD Students	33
Years since PhD	24
Google Rank in Robotics	#47
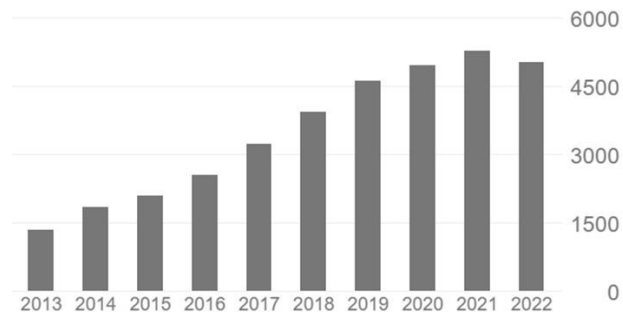
Academic Positions

July 2015-present	Full Professor (endowed), Mechanical Engineering Department and Data Science Institute, Columbia University, NY Co-Director, Columbia Makerspace
Apr 2015-June 2015	Full Professor, Mechanical & Aerospace Engineering and Computing & Information Science, Cornell University, Ithaca NY
Feb 2008-Mar 2015	Associate Professor, Mechanical & Aerospace Engineering and Computing & Information Science,, Cornell University, Ithaca NY
Jan 2010- Dec 12	Associate Director, Mechanical & Aerospace Engineering
Jul 2001- Jan 08	Assistant Professor, Mechanical & Aerospace Engineering, and Computing & Information Science, Cornell University, Ithaca NY
Nov 1998-Jul 2000	Lecturer, Mechanical Engineering Dept., Massachusetts Inst. of Technology, Cambridge MA. Advisor: Prof. Nam P. Suh
Nov 1998-Jul 2001	Postdoctoral researcher, Brandeis Univ., Computer Science Dept., Brandeis University, Waltham MA. Advisor: Prof. Jordan Pollack.

Education

Nov 94-Oct 98	Technion Israel Institute of Technology – Ph.D. Mechanical Engineering. Thesis Title: "Reconstruction of a 3D object from a single freehand sketch as means for CAD interface for conceptual design and analysis" (Advisor: Prof. M. Shpitalni). Awarded 1999
Sep 85-Jul 89	Technion Israel Institute of Technology – B.Sc. Mechanical Engineering, Cum Laude. Awarded 1989

Startup Companies Founded

2014	3DBio Inc.	Co-founder, Bioprinting (Active).
2011	Nutonian Inc.	Co-founder, Scientific Data Mining (Acquired).
2001	NetTrust Inc.	Co-founder, Certified Email Services (Inactive).
1994	Trilogical Inc.	Co-founder, GPS tracking (Acquired).

Editorial Positions

2020-presnt	Editorial Board, *Science Robotics (Impact factor 23.5)*
2018-presnt	Editorial Board, *Soft Robotics (Impact factor 8.07)*
2013-2015	Founding Editor-in-Chief, *3D Printing and Additive Manufacturing (3DP)*, Mary Ann Liebert Publishing (*Impact factor 3.5*)

Professional Positions

1989-1994	Israel Defense Force	Lt. Cmdr. (Navy) – Full time active duty
1996-1997	ASI Inc.	Software developer, created optical calibration system for interference imaging, Haifa Israel
1987-1993	Zorba Technologies	Software developer, Sheet Metal CAD/CAM Expert System, Winterweijk, Netherland

Teaching

Spring 2023	Columbia	**Digital Manufacturing** (MECE 4606, enrollment 107)
Spring 2023	Columbia	**Robotics Studio** (MECE 4611, enrollment 75)
Fall 2022	Columbia	**Evolutionary Computation** (MECS 4510, enrollment 61)
Fall 2022	Columbia	**Robotics Studio** (MECE 4611, enrollment 84)
Spring 2022	Columbia	**Digital Manufacturing** (MECE 4606, enrollment 122)
Spring 2022	Columbia	**Robotics Studio** (MECE 4611, enrollment 78)
Fall 2021	Columbia	**Evolutionary Computation** (MECS 4510, enrollment 110)
Fall 2021	Columbia	**Robotics Studio** (MECE 4611, enrollment 75)
Spring 2021	Columbia	**Digital Manufacturing** (MECE 4606, enrollment 110)
Spring 2021	Columbia	**Robotics Studio** (MECE 4611, enrollment 40)
Fall 2020	Columbia	**Evolutionary Computation** (MECS 4510, enrollment 60)
Fall 2020	Columbia	**Robotics Studio** (MECE 4611, enrollment 40)
Spring 2020	Columbia	**Digital Manufacturing** (MECE 4606, enrollment 60)

Spring 2020	Columbia	**Robotics Studio** (MECE 4611, enrollment 35)
Fall 2019	Columbia	**Evolutionary Computation** (MECS 4510, enrollment 60)
Spring 2019	Columbia	**Digital Manufacturing** (MECE 4606, enrollment 55)
Spring 2019	Columbia	**Robotics Studio** (MECE 4611, enrollment 26)
Fall 2018	Columbia	**Evolutionary Computation** (MECS 4510, enrollment 24)
Fall 2018	Columbia	**Special Topics - Robotics** (MECE 8990 enrollment 12)
Spring 2018	Columbia	**Digital Manufacturing** (MECE 4606, enrollment 55)
Fall 2017	Columbia	**Evolutionary Computation** (MECS 4510, enrollment 24)
Spring 2017	Columbia	**Digital Manufacturing** (MECE 4606, enrollment 51)
Spring 2017	Columbia	**Kinematics of Machines** (MECE 3401, enrollment 9)
Fall 2016	Columbia	**Machine Design** (MECE 3409, enrollment 70)
Spring 2016	Columbia	**Digital Manufacturing** (MECE 4606 enrollment 36**)**
Fall 2015	Columbia	Teaching leave (due to move from Cornell to Columbia)
Spring 2015	Cornell	Parental teaching leave (newborn)
Fall 2014	Cornell	**Evolutionary Computation (CS5724)**, Graduate course covering evolutionary computation and applications, enrolment ~20
Summer 2014	CAU	**3D Printing** (approx. 50 participants)
Spring 2013,14	Cornell	**Mechanical Engineering Synthesis (MAE2250)** on product design process, Required Introductory Sophomore course enrolment ~180
Fall 2012,13	Cornell	**Evolutionary Computation (CS5724)**, Graduate course covering evolutionary computation and applications, enrolment ~20
Fall 2009-11	Cornell	**Foundations of Artificial Intelligence (CS4700)**, Introduction to artificial Intelligence, enrollment ~100
Fall 2009-11	Cornell	**AI Practicum: (CS4701)**, project course in AI applications in physical robotics, enrollment 25
Fall 2007	Cornell	**AI Practicum: Robotics and embodied AI (CS473)**, project course in AI applications in physical robotics, enrollment 25
Fall 2002,4,6,8	Cornell	**Evolutionary Computation and Design Automation (CS750/ MAE650)**, Graduate course covering evolutionary computation and applications, enrolment ~25
Spring 2001-8	Cornell	**Mechanical Engineering Synthesis (MAE225)** on product design process, Required Introductory Sophomore course enrolment ~120-140
Fall 2002,3,5	Cornell	**Data structures and algorithms for Computational Science (CIS409/MAE409)**, Advanced undergraduate / Beginning graduate course in, on algorithm design for non-CS majors, enrollment ~15
Fall 2001	Cornell	**Geometric Modeling and Computer Aided Design (MAE580)**, covering mathematical models of geometry and topology
Spring 2000	Brandeis	Topics in Computer Systems / Computer Aided Design and Geometric Modeling
Fall 2000	MIT	Axiomatic Design (Co-Lecturer)
1997-1998	Technion	Computational Geometry (Teaching Assistant)

| 1996-1997 | Technion | Computer Aided Design Laboratory (Project Tutor) |
| 1995-1997 | Technion | Fluid Mechanics (Teaching Assistant) |

Graduate and Postdoc Students

Current PhD Students

1. **Jiong Lin** 2023-present, Guided Assembly, Metamodeling (Mechanical Engineering)

2. **Ani Iyer** 2022-present, TBD, (Mechanical Engineering)

3. **Judah Goldfeder** 2022-present, "Label Learning", (Computer Science)

4. **Max Segan** 2021-present, "Foundation Models", (Computer Science)

5. **Yuang Hu** 2021-present, "Facially expressive Robot", (Mechanical Engineering)

6. **Hayley McClintok** 2020-present, "Carbon Fiber Lattices", (Mechanical Engineering)

7. **Zechen Xiong** 2018-present, "Actuated Buckling", (Erath and Environmental)

8. **Philippe Wyder** 2018-present, "Robot Metabolism", (Mechanical Engineering)

9. **John Whitehead**, 2018-present, "Inverted Laser Sintering", (Mechanical Engineering).

Graduated PhD Students (Committee chair)

10. **Robert Kwiatkowski** 2018-2022, "Self-Modeling Systems", (Computer Science)

11. **Boyuan Chen-** 2018-2022, "Robot Theory of Mind", (Computer Science)

12. **Boxi Xia 2017-**2022, "Soft Robotics", (Mechanical Engineering)

13. **Jonathan Blutinger-** 2017-2022, "Laser Cooking", (Mechanical Engineering)

14. **Joni Mici,** 2015-2022, "Layered Assembly", (Mechanical Engineering).

15. **Yazmin Feliz** – 2015-2020, "3D Ultrasound", (Mechanical Engineering)

16. **Oscar Chang -** 2016-2020, "Autogenerative networks", (Computer Science).

17. **Siyuan Chen** - 2015-2019, "Data Smashing", (Mechanical Engineering).

18. **Richa Batra -** 2014-2019, "Particle Robotics", (Mechanical Engineering).

19. **Nick Cheney**, 2012-2017, "Automated Design of Embodied Machines", (Comp. Biology).

20. **Igor Labutov**, 2010-2016, "Machine Teaching", (Electrical Engineering).

21. **Jason Yosinski**, 2011-2016, "Deep learning", (Computer Science).

22. **Jeff Lipton,** 2010-2015, 3D printing, (Mechanical Engineering).

23. **Robert MacCurdy**, 2009-2015, Machine Self Reflection (Mechanical Engineering).

24. **Jonas Neubert**, 2008-2014, Programmable Matter (Mechanical Engineering).

25. **Ted Cornforth**, 2009-2014, "Reverse engineering dynamical systems", (Comp. Biology)

26. **Daniel Ly**, 2009-2013, Automated Telescience (Mechanical Engineering).

27. **John Amend**, 2008-2013, Jamming robotics: Programmable Phase Transition Materials (Mechanical Engineering).

28. **Jonathan Hiller**, 2006-2011, Digital Manufacturing (Mechanical Engineering).

29. **Michael Schmidt**, 2006-2010, Co-evolutionary System Identification (Computational Biology).

30. **Michael Tolley**, 2005-2010, Micro Self-Assembling Stochastic Robotics (Field: ME). Currently Faculty at University of California San Diego (UCSD).

31. **Daniel L. Cohen**, 2005-2010, 3D Bioprinting (Mechanical Engineering).

32. **Evan Malone**, 2002-2008; Multimaterial Solid Freeform Fabrication of Active Systems (Mechanical Engineering).

33. **Viktor Zykov**, 2003-2007, Damage Diagnosis and Repair in Robotic Systems (Mechanical Engineering).

Graduated MSc Students (Committee chair)

1. **Cheryl Perich**, 2010-2012, "Parallel assembly using Electro Osmosis", (Field: Mechanical Engineering).

2. **Charlie Richter**, 2010-2011, "Flapping flight – modeling, design, and control", (Field: Aerospace).

3. **Nicholas Estevez**, 2004-2006, Functional Representations for Design.

4. **David Hejelle**, 2007-2009, Machine Metabolism (Field: Mechanical Engineering).

5. **Aaron Leftensy**, 2008-2010, Learning Dynamics (Field: Computer Science).

Visiting Master students advised (Columbia)

1. **Drim Stokhuijzen,** 2015-2016, Food Printing (U Utrecht, Netherlands)

2. **Anastasia Markova,** 2016-2017, Deep Learning for crop identification

3. **Yorán Meijers,** 2017, Food Printing

Postdocs advised

1. **Jonathan Blutinger,** 2022-2023, Food Printing and Laser cooking

2. **Yazmin Feliz,** 2020-2021, 3D Ultrasound

3. **Li Sun,** 2018-2019, Earthquake Modeling

4. **Aslan Miriyev**, 2015-2018, Soft Actuators

5. **Jun Ogawa** (2015-2016) Evolutionary Robotics

6. **Petar Curkovic**, 2014-2015, Design Automation

7. **Shuguang Li**, 2014-2015, Morphing Robotics

8. **Navneet Bhalla**, 2014-2015, Self-Assembly

9. **Ishanu Chattopadhyay**, 2011-2014, Machine Learning.

10. **Daniel Ly** 2013-present, Automated Modeling

11. **Jonathan Platkiewicz**, 2013-2014, Haptic sensing.

12. **Sebastian Risi**, 2012-2013, Neuroevolution.

13. **Ben Finio**, 2012-2013, Manufacturing Education.

14. **Jeff Clune**, 2010-2012, Evolutionary design and modularity,

15. **David Kou,** 2010, CAD/CAM.

16. **Juan Zagal**, 2008-2010, Machine Self-reflection.

17. **Eric Schweikardt**, 2008-2009, Modular Robotics..

18. **Kyung-Joong Kim**, 2006-2009, Cognitive evolutionary robotics.

19. **Nicolas Lassabe**, 2008, Modular robotics

20. **Viktor Zykov**, 2008, Damage Diagnosis and Repair in Robotic Systems

21. **John Reiffel**, 2006-2007, Tensegrity robotics.

22. **Anupam Saxena**, 2005-2007, Inference of biological networks.

23. **Sanjeev Kumar**, 2004-2006, Algorithms for Muskuloskeletal inference.

24. **Mark Masry**, 2004-2005, Algorithms for 3D Sketch understanding.

25. **Chandana Paul**, 2004-2005, Tensegrity Robotics

26. **Josh Bongard**, 2003-2006, Co-evolutionary algorithms for system design and analysis.

Honors and Awards Received

- Laureate of the 2022 Aurel Stodola Medal (ETH Zurich)

- Columbia Engineering Alumni Association (CEAA) Distinguished Faculty Teaching Award, 2021

- Outstanding Publication of the Decade 2004-2014, International Society for Artificial Life 2019

- Second place, Robotic Art competition, 2018 (RobotArt.org)

- Student Best Paper award, Robosoft, 2018

- First place, Robotic Art competition, 2017 (RobotArt.org)

- Top 25 Book in China 2013 (out of 400,000 new books in Chinese)

- Elected Faculty to Tau Beta Pi Honor Society, 2013

- US National Academy of Engineering Annual Gilbreth Lecturer, 2012.

- Forbes "Top 7 Data scientists in the world", 2011.

- MSNBC #1 must-see science videos of 2011.

- Best paper award in Physical Biology "Highlights of 2011".

- Popular Science's one of 25 most Awesome labs in the US, 2011.

- Discover Magazine's 25 most important discoveries of 2009.

- ASME SMASIS'09 Honored Finalist Award, 2009.

- Cornell Hellenic Societies Faculty Award, 2008.

- Best paper of the year award. Rapid Prototyping Journal, 2008.

- Provost Distinguished Scholarship Award, 2008.

- Merrill Educator Award, 2008.

- ASME 2007 International Mechanical Engineering Congress and Exposition (IMECE) Best Presentation Award.

- Esquire Magazine Best & Brightest, 2007.

- Best paper Award, Genetic and Evolutionary Computation Conference (GECCO), 2007.

- Popular Mechanics Breakthrough Award, 2007.

- DARPA MTO Young Faculty Award, 2007.

- Outstanding Paper, Solid Freeform Fabrication (SFF'06).

- NSF Young Investigator CAREER award, 2006.

- ENTRY 2006 "Most important innovations in robotic technology".

- Best-in-Tech 2005, MIT Technology Review (German Edition).

- Outstanding Paper, Solid Freeform Fabrication (SFF'05).

- Gold Medal for Human Competitive Automated Invention, GECCO 2005.

- Best Paper Award, International Conference on Advanced Robotics (ICAR'05).

- National Academies "Frontiers of Engineering" speaker.

- Silver Medal for Human Competitive Automated Invention, GECCO 2004.

- TIME Magazine's "Most important events of 2000".

- Biophysical Society "New and Notable", 2001.

- Shaping The Future, EXPO'2000.

- Fischbach Postdoctoral Scholarship, 1998-1999.

- CIRP International F.W. Taylor Medal, 1997.

- Charles Clore Doctoral Fellowship, 1996.

- Miriam and Aaron Gutwirth Memorial Award, 1996.

- 1st Prize for Academic Innovation, *ITIM 9th Israeli Conference on CAD/CAM*, Tel Aviv, 1987.

Refereed Journal Publications (published or in press)

1. Blutinger, J. D., Cooper, C. C., Karthik, S., Tsai, A., Samarelli, N., Storvick, E., … Lipson H & Lipson, H. (2023). The future of software-controlled cooking. *Nature Science of Food*, 7.

2. Whitehead J, Lipson H (2022) "Multi-Process Printing Method Combining Powder and Resin Based Additive Manufacturing" *Additive Manufacturing Letters*, 2022

3. Whitehead J, Lipson H (2022) "Embedding Components During Laser Sintering" *Additive Manufacturing Letters*, 2022

4. Nelson, B. J., Dupont, P., Floreano, D., Goldberg, K., Gu, H., Jacobstein, N., … Lipson H & Lipson, H. (2022). What we look for at Science Robotics. *Science Robotics*, 7(71), eade5834.

5. Perich, C., MacCurdy, R., Macner, A., Mici, J., Steen, P., & Lipson, H. (2022). Electro-Osmotic Gripper Characterization for Layered Assembly. *3D Printing and Additive Manufacturing*, 9(4), 337-347.

6. Chen, B., Kwiatkowski, R., Vondrick, C., & Lipson, H. (2022). Fully body visual self-modeling of robot morphologies. *Science Robotics*, 7(68), eabn1944.

7. Chen, B., Huang, K., Raghupathi, S., Chandratreya, I., Du, Q., & Lipson, H. (2022). Automated discovery of fundamental variables hidden in experimental data. *Nature Computational Science*, 2(7), 433-442.

8. Sofia Di Toro Wyetzner, Salvy Cavicchio, Andrew Moshova, Hod Lipson (2022) "Regenerative Topology Optimization of Fine Lattice Structures", **Journal of 3D Printing and Additive Manufacturing**

9. Wyder, Philippe M., and Hod Lipson. "Visual design intuition: predicting dynamic properties of beams from raw cross-section images." **Journal of the Royal Society Interface 18.184** (2021): 20210571.

10. Tai, A., Chun, M., Gan, Y., Selamet, M., & Lipson, H. (2021). PARA: A one-meter reach, two-kg payload, three-DoF open source robotic arm with customizable end effector. **HardwareX**, 10.

11. Faraj, Z., Selamet, M., Morales, C., Torres, P., Hossain, M., Chen, B., & Lipson, H. (2021). Facially expressive humanoid robotic face. *HardwareX*, 9, e00117.

12. Blutinger, J. D., Tsai, A., Storvick, E., Seymour, G., Liu, E., Samarelli, N., ... & Lipson, H. (2021). Precision cooking for printed foods via multiwavelength lasers. *NPJ science of food*, 5(1), 1-9.

13. Floreano, D., & Lipson, H. (2021). From individual robots to robot societies. *Science Robotics*, 6(56), eabk2787.

14. Perich, C., MacCurdy, R., Macner, A., Mici, J., Steen, P., & Lipson, H. (2021). Electro-Osmotic Gripper Characterization for Layered Assembly. *Journal of 3D Printing and Additive Manufacturing.*

15. Chen, B., Vondrick, C., & Lipson, H. Visual behavior modelling for robotic theory of mind. *Scientific reports*, 11(1), 424.

16. Whitehead, J., & Lipson, H. (2020). Inverted multi-material laser sintering. *Additive Manufacturing*, 36, 101440.

17. Hiller, J., Mici, J., & Lipson, H. (2020). Layered assemblers for scalable parallel integration. *Journal of the Royal Society Interface*, 17(171), 20200543-20200543.

18. Xia, B., Miriyev, A., Trujillo, C., Chen, N., Cartolano, M., Vartak, S., & Lipson, H. (2020). Improving the Actuation Speed and Multi-Cyclic Actuation Characteristics of Silicone/Ethanol Soft Actuators. In *Actuators* (Vol. 9, No. 3, p. 62). MDPI AG.

19. West, J. D., Mici, J., Jaquith, J. F., & Lipson, H. (2020). Design and optimization of millimeter-scale electroadhesive grippers. *Journal of Physics D Applied Physics*, 53(43), 435302.

20. Lehman, J., Clune, J., Misevic, D., Adami, C., Altenberg, L., Beaulieu, J., ... & Yosinski, J. (2020). The Surprising Creativity of Digital Evolution: A Collection of Anecdotes From the Evolutionary Computation and Artificial Life Research Communities. *Artificial life*, 26(2), 274-306.

21. Wiesner-Hanks, T., Wu, H., Stewart, E., DeChant, C., Kaczmar, N., Lipson, H., ... & Nelson, R. J. (2019). Millimeter-level plant disease detection from aerial photographs via deep learning and crowdsourced data. *Frontiers in plant science*, 10, 1550.

22. Lipson, H. "Robots on the run (vol 4, eaau5872, 2019)." **Nature** 576.7787 (2019): 397-397.

23. Mici, J., Ko, J. W., West, J., Jaquith, J., & Lipson, H. (2019). Parallel electrostatic grippers for layered assembly. **Additive Manufacturing**, 27, 451-460

24. Wu, Harvey, et al. "Autonomous detection of plant disease symptoms directly from aerial imagery." **The Plant Phenome Journal** 2.1 (2019).

25. Blutinger, Jonathan David, Yorán Meijers, and Hod Lipson. "Selective laser broiling of Atlantic salmon." **Food research international** 120 (2019): 196-208

26. A Miriyev, B Xia, JC Joseph, H Lipson "Additive Manufacturing of Silicone Composites for Soft Actuation**", 3D Printing and Additive Manufacturing** 6 (6), 309-318

27. Kwiatkowski, R., & Lipson, H. (2019). Task-agnostic self-modeling machines. **Science Robotics**., 4, eaau9354.

28. Li, S., Batra, R., Brown, D., Chang, H. D., Ranganathan, N., Hoberman, C. Rus D, Lipson, H. (2019). Particle robotics based on statistical mechanics of loosely coupled components. **Nature**, 567(7748), 361.

29. J Mici, JW Ko, J West, J Jaquith, H Lipson (2019) "Parallel Electrostatic Grippers for Layered Assembly ", **Additive Manufacturing** (in press)

30. Lipson H., (2019) "Robots On The Run", Nature 568, 174-175 (2019)

31. Blutinger, J. D., Meijers, Y., & Lipson, H. (2019). Selective laser broiling of Atlantic salmon. **Food Research International**, 120, 196-208.

32. Cartolano, M., Xia, B., Miriyev, A., & Lipson, H. (2019, March). Conductive Fabric Heaters for Heat-Activated Soft Actuators. In **Actuators** (Vol. 8, No. 1, p. 9). Multidisciplinary Digital Publishing Institute.

33. Blutinger, J. D., Meijers, Y., Chen, P. Y., Zheng, C., Grinspun, E., & Lipson, H. (2019). Characterization of CO_2 laser browning of dough. Innovative **Food Science & Emerging Technologies**, 52, 145-157.

34. Chen, P. Y., Blutinger, J. D., Meijers, Y., Zheng, C., Grinspun, E., & Lipson, H. (2019). Visual modeling of laser-induced dough browning. **Journal of food engineering**, 243, 9-21.

35. Fabian Stute, Joni Mici, Lewis Chamberlain, Hod Lipson, (2019) "Digital Wood: 3D Internal Color Texture Mapping" **3D Printing and Additive Manufacturing** Vol 5 No 4 pp 285-291

36. Wiesner-Hanks, T., Stewart, E. L., Kaczmar, N., DeChant, C., Wu, H., Nelson, R. J., ... & Gore, M. A. (2018). Image set for deep learning: field images of maize annotated with disease symptoms. **BMC research notes**, 11(1), 440.

37. Hertafeld, E., Zhang, C., Jin, Z., Jakub, A., Russell, K., Lakehal, Y., ... & Lipson, H. (2018). Multi-material three-dimensional food printing with simultaneous infrared cooking. 3D Printing and Additive Manufacturing, 6(1), 13-19.

38. Cheney, N., Bongard, J., SunSpiral, V., & Lipson, H. Scalable Co-Optimization of Morphology and Control in Embodied Machines. **Royal Society Interface**, In review (second cycle)

39. Blutinger, J. D., Meijers, Y., Chen, P. Y., Zheng, C., Grinspun, E., & Lipson, H. (2018). Characterization of dough baked via blue laser. **Journal of Food Engineering**, 232, 56-64.

40. A Miriyev, G Caires, H Lipson, (2018) Functional properties of silicone/ethanol soft-actuator composites, **Materials & Design** 145, 232-242

41. Cellucci, D., MacCurdy, R., Lipson, H., & Risi, S. (2017). 1D Printing of Recyclable Robots. IEEE **Robotics and Automation Letters,** 2(4), 1964-1971.

42. Miriyev, A., Stack, K., & Lipson, H. (2017). Soft material for soft actuators. **Nature communications**, 8(1), 596.

43. DeChant, C., Wiesner-Hanks, T., Chen, S., Stewart, E. L., Yosinski, J., Gore, M. A., ... & Lipson, H. (2017). Automated identification of northern leaf blight-infected maize plants from field imagery using deep learning. **Phytopathology**, 107(11), 1426-1432.

44. Amend J, Lipson H (2017) "The JamHand: Dexterous Manipulation with Minimal Actuation" **Soft Robotics** 4 (1), 70-80

45. Grouchy, P., D'Eleuterio, G. M., Christiansen, M. H., & Lipson, H. (2016). "On The Evolutionary Origin of Symbolic Communication". **Scientific Reports**, 6.

46. Lipton, J. I., & Lipson, H. (2016). 3D printing variable stiffness foams using viscous thread instability. **Scientific Reports**, 6.

47. Lipton JI, Angle S, Banai RE, Peretz E, Lipson H, (2016) "Electrically Actuated Hydraulic Solids", **Advanced Engineering Materials** 18 (10), 1710-1715

48. Lipton JI, Cutler M, Nigl F, Cohen D, Lipson H (2016) Additive manufacturing for the food industry, **Trends in Food Science & Technology** 43 (1), 114-123

49. Cheney, N., & Lipson, H. (2016). Topological evolution for embodied cellular automata. **Theoretical Computer Science**, 633, 19-27.

50. TW Cornforth, H Lipson (2015) A hybrid evolutionary algorithm for the symbolic modeling of multiple-time-scale dynamical systems, **Evolutionary Intelligence** 8 (4), 149-164

51. Platkiewicz, J., Lipson, H., & Hayward, V. (2016). Haptic Edge Detection Through Shear. **Scientific reports**, 6

52. J Neubert, H Lipson Soldercubes: a self-soldering self-reconfiguring modular robot system, **Autonomous Robots** 40 (1), 139-158

53. Chattopadhyay, Ishanu, and Hod Lipson. (2014) "Data smashing: uncovering lurking order in data." **Journal of The Royal Society Interface,** Vol. 11, no. 101 (2014): 20140826.

54. Neubert, J., Rost, A., and Lipson, H. (2014) "Self-Soldering Connectors for Modular Robots". **IEEE Transactions on Robotics**. Vol. 30, no. 6, pp. 1344-1357

55. MacCurdy, R., McNicoll, A., and Lipson, H. (2014) "Bitblox: Printable digital materials for electromechanical machines". **The International Journal of Robotics Research** (IJRR). Vol. 33 no. 10, pp. 1342-1360

56. Lipson H., (2014) "Challenges and Opportunities for Design, Simulation, and Fabrication of Soft Robots" **Soft Robotics**. March 2014, 1(1): 21-27.

57. Bongard J and Lipson H, (2014) "Evolved Machines Shed Light on Robustness and Resilience", **Proceedings of the IEEE**, Vol.102, No. 5, pp. 899 - 914

58. Hiller J, Lipson H., (2014), "Dynamic Simulation of Soft Multi-Material 3D-Printed Objects", **Soft Robotics**, Soft Robotics. March 2014, 1(1): 88-101.

59. Athanasios G. Athanassiadis, Marc Z. Miskin, Paul Kaplan, Nicholas Rodenberg, Seung Hwan Lee, Jason Merritt, Eric Brown, John Amend, Hod Lipson and Heinrich M. Jaeger (2014) "Particle shape effects on the stress response of granular packings", **Soft Matter** 10, 48–59

60. Chattopadhyay, I., Kuchina, A., Suel, G. and Lipson, H. (2013) "Inverse Gillespie for inferring stochastic reaction mechanisms from intermittent samples." **PNAS**, July 22, 2013.

61. Lipton, J. and Lipson, H. (2013) "Adventures in Food Printing". **IEEE Spectrum**, May 31, 2013.

62. Ly, D.L. and Lipson, H. (2013) "Optimal Experiment Design for Coevolutionary Active Learning". **IEEE Transactions on Evolutionary Computation**. (In press)

63. Clune, J., Baptiste-Mouret, J-B., Lipson, H. (2013) "The evolutionary origins of modularity". **Proceedings of the Royal Society** B 280 (1755).

64. Nigl, F., Li, S., Blum, J. E., Lipson, H. (2013) "Autonomous Truss Reconfiguration and Manipulation", **IEEE Robotics and Automation Magazine**, accepted for publication

65. Chattopadhyay I. and Lipson H. (2013) "Abductive learning of quantized stochastic processes with probabilistic finite automata", **Phil Trans R Soc A**, 371: 20110543.

66. Hockaday, L.A., Kang, K.H., Colangelo, N.W., Cheung, P.Y.C., Duan, B., Malone, E., Wu, J., Girardi, L.N., Bonassar, L.J., Lipson, H., Chu, C.C., and Butcher, J.T. (2012) "Rapid 3D printing of anatomically accurate and mechanically heterogeneous aortic valve hydrogel scaffolds", **Biofabrication, Highlights of 2012**, 10.1088/1758-5082/4/3/035005. *Selected for the Highlights of 2012 Biofabrication *

67. Lipson H. (2012) "Thinking outside the CAD box: design in the age of 3-D printing", **Mechanical Engineering**, Oct 2012

68. Ly, D.L. and Lipson, H. (2012) "Learning Symbolic Representations of Hybrid Dynamical Systems", **Journal of Machine Learning Research**, Vol. 13, pp.3585-3618.

69. Hiller, J. and Lipson, H. (2012) "Automatic Design and Manufacture of Soft Robots" **IEEE Transactions on Robotics**, Vol. 28, No. 2, pp. 457-466.

70. Saxena, A., Lipson, H., and Valero-Cuevas, F.J. (2012) "Functional inference of complex anatomical tendinous networks at a macroscopic scale via sparse experimentation". **PLoS Computational Biology**, 8(11): p.1-17, 2012.

71. Hockaday, L.A., Kang, K.H., Colangelo, N.W., Cheung, P.Y., Duan, B., Malone, E., Wu, J., Girardi, L.N., Bonassar, L.J., Lipson, H., Chu, C.C., Butcher, J.T (2012) "Rapid 3D printing of anatomically accurate and mechanically heterogeneous aortic valve hydrogel scaffolds", **Biofabrication**, Vol. 4, 035005.

72. Kurse, M.U., Lipson, H. and Valero-Cuevas, F.J. (2012) "Extrapolatable analytical functions for tendon excursions and moment arms from sparse datasets", **IEEE Transactions on Biomedical Engineering**, Vol. 59, pp. 1572-1582.

73. Guzek, J.J., Petersen, C., Constantin, S., and Lipson, H. (2012) "Mini Twist: A Study of Long-Range Linear Drive by String Twisting", **ASME Journal of Mechanisms and Robotics**, 4, 014501 (2012).

74. Valsalam, V.K., Hiller, J., MacCurdy, R., Lipson, H., and Miikkulainen, R. (2012) "Constructing controllers for physical multilegged robots using the ENSO neuroevolution approach", **Evolutionary Intelligence**, Vol. 5, No. 1, 45-56.

75. Amend, J. R. Jr., Brown, E. M., Rodenberg, N., Jaeger, H. M., Lipson, H. (2012) "A Positive Pressure Universal Gripper Based on the Jamming of Granular Material", **IEEE Transactions on Robotics**, Vol. 28, pp. 341 – 350.

76. Lipson, H. (2012) "Frontiers in Additive Manufacturing", **The Bridge (National Academies)**, Vol. 42, No. 1, Spring 2012, pp. 5-12.

77. Schmidt, M. D., Vallabhajosyula, R. R., Jenkins, J. W., Hood, J. E., Soni, A. S., Wikswo, J. P., et al. (2011). "Automated refinement and inference of analytical models for metabolic networks", **Physical Biology**, 8(5).

78. Garcia, R.F.M., Hiller, J.D., Stoy, K., Lipson, H. (2011) "A Vacuum-Based Bonding Mechanism for Modular Robotics", **IEEE Transactions on Robotics**, 27(5): 876-890.

79. Lipson, H. (2011) "Self-Reflective Architecture", **Cornell Journal of Architecture**, Vol. 8, pp. 16-23.

80. Tolley, M. and Lipson, H. (2011) "On-line assembly planning for stochastically reconfigurable systems", **International Journal of Robotics Research**, Vol. 30 (11).

81. Hiller, J., Miller, J, Lipson, H. (2011) "Microbricks for 3D Reconfigurable Modular Microsystems", **IEEE Journal of Microelectromechanical Systems**, Vol. 20, No. 13, pp. 1566-1584.

82. Kou, X.Y., Tan, S.T., Lipson, H. (2011) "A data-driven process for estimating nonlinear material models," **Applied Mechanics and Materials**, vol. 50-51, pp. 599-604.

83. Richter, C. and Lipson, H. (2011) "Untethered Hovering Flapping Flight of a 3D-Printed Mechanical Insect", **Artificial Life**, Vol. 17, No. 2, pp. 73-86.

84. Li, S., Yuan, J., and Lipson, H. (2011) "Ambient wind energy harvesting using cross-flow fluttering", **Journal of Applied Physics**, 109, 026104.

85. Cohen, D. L., Lo, W., Tsavaris, A., Peng, D., Lipson, H., Bonassar, L.G. (2011) "Increased mixing improves hydrogel homogeneity and quality of 3D printed constructs," **Tissue Eng** (Part C Methods), 17(2):239-248.

86. Brown, E., Rodenberg, N., Amend, J., Mozeika, A., Steltz, E., Zakin, M., Lipson, H., Jaeger, H. (2010) "Universal robotic gripper based on the jamming of granular material," **Proceedings of the National Academy of Sciences (cover),** Vol. 107, no. 44, pp. 18809-18814.

87. Ballyns, J.J., Cohen, D.L., Malone, E., Maher, S.A., Potter, H.G., Wright, T., Lipson, H., Bonassar, L.J. (2010) "An Optical Method for Evaluation of Geometric Fidelity for Anatomically Shaped Tissue Engineered Constructs", **Tissue Eng Part C Methods**. 2010 Aug, 16(4):693-703.

88. Rieffel, J., Valero Cuevas, F., Lipson, H. (2010) "Morphological Communication: Exploiting Coupled Dynamics in a Complex Mechanical Structure to Achieve Locomotion", *Journal of the Royal Society Interface*, Vol. 45.

89. Kalontarov, M., Tolley, M. T., Lipson, H., Erickson, D. (2010) "Hydrodynamically Driven Docking of Blocks for 3D Fluidic Assembly", *Microfluidics and Nanofluidics*, Vol. 9, pp. 551-558.

90. Tolley, M. T., Kalontarov, M., Neubert, J., Erickson, D., Lipson, H. (2010) "Stochastic Modular Robotic Systems: A Study of Fluidic Assembly Strategies", *IEEE Transactions on Robotics*, Vol. 26, pp. 518-530.

91. Hiller, J. and Lipson, H. (2010) "Tunable digital material properties for 3D voxel printers", **Rapid Protyping Journal**, Vol. 16, No. 4, pp. 241-247.

92. Cohen, D. and Lipson, H. (2010) "Geometric feedback control of discrete-deposition SFF systems", *Rapid Prototyping Journal*, Vol. 16, No. 5, pp. 377-393.

93. Lipson, H. and Kurman, M. (2010) "Factory@Home: The Emerging Economy of Personal Fabrication", a report commissioned by the *Whitehouse Office of Science & Technology Policy*.

94. Chen, D.L., Lipton, J.I., Bonassar, L.J., Lipson, H. (2010) "Additive manufacturing for in situ repair of osteochondral defects", **Biofabrication**, Vol. 2, 035004.

95. Cornforth, T.W., Kim, K.J., Lipson, H. (2010) "Evolution of Analog Circuit Models of Ion Channels", **Lecture Notes in Computer Science**, Vol. 6274, pp. 157-168.

96. Rieffel, J., Valero-Cuevas, F., Lipson, H. (2010) "Morphological Communication: Exploiting Coupled Dynamics in a Complex Mechanical Structure to Achieve Locomotion", **Journal of the Royal Society Interface**, Vol. 45, pp. 613-621.

97. Schmidt, M.D. and Lipson, H. (2010) "Age-Fitness Pareto Optimization", **Genetic Programming Theory and Practice**, Vol. 8, pp. 129-146.

98. Schmidt, M. and Lipson, H. (2009) "Distilling Free-Form Natural Laws from Experimental Data," *Science*, Vol. 324, no. 5923, pp. 81 – 85.

99. Kim, K.J., Wong, A., Lipson, H. (2009) Automated Synthesis of Resilient and Tamper-Evident Analog Circuits without a Single Point of Failure, *Genetic Programming and Evolvable Machines* (online)*.*

100. Tian, C., Masry, M., Lipson, H. (2009) "Physical sketching: Reconstruction and analysis of 3D objects from freehand sketches", *Computer-Aided Design* Vol. 41, pp. 147-158.

101. Hiller, J., Lipson, H. (2009) "Design and analysis of digital materials for physical 3D voxel printing", *Rapid Prototyping Journal*, Vol. 15, No. 2, pp. 137-149.

102. Krishnan, M, Tolley M., Lipson, H., Erickson, D. (2009) "Hydrodynamically Tunable Affinities for Fluidic Assembly", *Langmuir*, Vol. 25, pp. 3769-3774.

103. Schmidt M. and Lipson H. (2009) "Symbolic Regression of Implicit Equations" Genetic Programming Theory and Practice, Vol. 7, Chapter 5, pp. 73-85.

104. Rieffel, J., Valero-Cuevas, F., Lipson, H. (2008) "Automated Discovery and Optimization of Large Irregular Tensegrity Structures", *Computers and Structures*, Vol. 87, pp.368-379.

105. Tolley, M., Krishnan M., Erickson, E., Lipson, H., (2008) "Deterministic Non-regular Microstructures from Regular Components", *Applied Physics Letters*, 93, 254105.

106. Adams, B., Lipson, H. (2008) "A Universal Framework for Analysis of Self-Replication Phenomena", *Entropy.*

107. Krishnan, M., Tolley, M. T., Lipson, H., Erickson, D. (2008), "Increased Robustness for Fluidic Self Assembly", *Physics of Fluids*, 20, 073304.

108. Song, H., Guimbretiere F., Hu, C., Lipson, H. (2008) "The ModelCraft Framework: Capturing Freehand Annotations and Edits to Facilitate the 3D Model Design Process Using a Digital Pen", *ACM Transactions on Computer Human Interaction*, Vol. 16, No. 3, Article 14.

109. Malone, E., Berry, M., Lipson, H. (2008) "Freeform fabrication of arbitrary geometry Zinc-Air Batteries", *Rapid Prototyping Journal*, Vol. 14, N 3, pp. 128-140.

110. Lipson, H. (2008) "Principles of Modularity, Regularity, and Hierarchy for Scalable Systems", *Journal of Biological Physics and Chemistry*, Vol. 7, pp. 125–128.

111. van Breugel, F., Regan, W., Lipson, H. (2008) "From Insects to Machines: A Passively Stable, Untethered Flapping-Hovering Micro Air Vehicle", *IEEE Robotics and Automation Magazine*, Vol. 15 No. 4, pp. 68-74.

112. Schmidt, M.D., Lipson, H. (2008) "Coevolution of Fitness Predictors", *IEEE Transactions on Evolutionary Computation*, Vol. 12, No 6, pp. 736-749.

113. Lipson, H. (2008) "Evolutionary Synthesis of Kinematic Mechanisms", *Artificial Intelligence in Design and Manufacturing*, Vol. 22, pp. 195–205.

114. Lipson, H. (2007) "Evolutionary Robotics: Emergence of Communication", *Current Biology*, Vol. 17 No 9, pp. R330-R332.

115. Bongard, J.C., Lipson, H. (2007) "Automated Reverse engineering of Nonlinear Systems", PNAS - **Proceedings of the National Academy of Sciences** . Vol. 104, no. 24, pp. 9943–9948.

116. Yim, M., Shen, W-M., Salemi, B., Rus, D., Moll M., Lipson H., Klavins E., Chirickjian G. S., (2007) "Modular Self-reconfigurable robotic systems", *IEEE Robotics and Automation Magazine*, Vol. 14 No. 1, pp. 43-52.

117. Valero-Cuevas, F., Anand, V., Lipson, H. (2007) "Beyond parameter estimation: Extending biomechanical modeling by the explicit exploration of model topology", *IEEE Transactions on Biomedical Engineering*, Vol. 54 No. 11, pp. 1951-1964.

118. Malone, E., Lipson, H. (2007) "Fab@Home: The Personal Desktop Fabricator Kit", *Rapid Prototyping Journal,* Vol. 13, No. 4, pp. 245-255.

119. Schmidt, M., Xu, Q., Lipson, M., and Lipson, H. (2007) "Overcoming Traditional Manufacturing Limitations in High Q Micro-ring Resonators Using Non-linear Effects in Silicon", in Nonlinear Optics: Materials, Fundamentals and Applications, OSA Technical Digest (CD) (Optical Society of America, 2007), paper WE22.

120. Cohen DL, Malone E, Lipson H, Bonassar LJ , (2007) "Direct freeform fabrication of seeded hydrogels in arbitrary geometries", Tissue engineering 12 (5), 1325-1335

121. Bongard, J.C., Zykov, V., Lipson, H. (2006) "Resilient Machines through Self-Modeling", *Science*, Vol. 314. no. 5802, pp. 1118 – 1121.

122. Zykov, V., Mytilinaios, E., Desnoyer, M., Lipson H. (2006) "Evolved and Designed Modular Robotics Systems Capable of Self -Reproduction", *IEEE Transactions on Robotics* Vol. 23 No. 2, pp. 308-319.

123. Valero-Cuevas, F.J., Yi1 JW, Brown D, McNamara R V, Paul C, Lipson H (2006) "The tendon network of the fingers performs anatomical computation at a macroscopic scale", *IEEE Transactions on Biomedical Engineering*, Vol. 54 No. 6, pp. 1161-1166.

124. Aquino, W., Kouchmeshky, B., Bongard, J., Lipson, H., (2007) "Co-evolutionary algorithm for structural damage identification using minimal physical testing", *Int. Journal for Numerical Methods in Engineering*, Vol. 69, Issue 5, pp. 1085-1107.

125. Cohen, D. L., Malone, E., Lipson, H., Bonassar, L., (2006) "3D direct printing of heterogeneous tissue implants", *Tissue Engineering,* Vol. 12, No. 5, pp. 1325-1335.

126. Gondarenko A., Preble S., Robinson J., Chen L., Lipson H., Lipson M., (2006) "Spontaneous emergence of periodic patterns in a biologically-inspired simulation of photonic structures", *Physical Review Letters,* Vol. 96, 143904.

127. Malone, E. and Lipson, H. (2006) "Freeform Fabrication of IPMC polymer actuators", *Rapid Prototyping*, Vol. 12, No. 5, pp.244-253.

128. Lipson, H. (2006) "A relaxation method for simulating the kinematics of compound nonlinear mechanisms", *ASME Journal of Mechanical Design*, Volume 128, Issue 4, pp. 719-728.

129. Pau,l C., Valero-Cuevas F. J., Lipson, H. (2006) "Design and Control of Tensegrity Robots", *IEEE Transactions on Robotics*, Vol. 22 No. 5 pp. 944- 957.

130. Zykov, V., Mytilinaios, E., Adams, B., Lipson, H. (2005) "Self-reproducing machines", *Nature*, Vol. 435 No. 7038, pp. 163-164.

131. Bongard, J. C, Lipson, H. (2005) ""Active Coevolutionary Learning of Deterministic Finite Automata", *Journal of Machine Learning research* (JMLR), Vol. 6 No. 10, pp. 1651-1678.

132. Masry, M., Kang, D.J., Lipson, H. (2005) "A Pen-Based Freehand Sketching Interface for Progressive Construction of 3D Objects", *Computers & Graphics*, Volume 29, 2005, pp. 563-575.

133. Preble, S., Lipson, H., Lipson, M. (2005) "Two-dimensional photonic crystals designed by evolutionary algorithms", *Applied Physics Letters*, Vol. 86, p. 6111-4 **** Gold Medal for Human Competitive Automated Invention ****

134. Lipson, H., Moon, F.C., Hai, J., Paventi, C. (2005) "3D-Printing the History of Mechanisms", *ASME Journal of Mechanical Design*, Vol. 127, pp. 1029-1033.

135. Lipson H. (2005) "Homemade: The future of Functional Rapid Prototyping", *IEEE Spectrum*, May 2005, pp. 24-31. **(Feature article)**

136. Bongard J., Lipson H. (2005) "Nonlinear system identification using coevolution of models and tests", *IEEE Transactions on Evolutionary Computation*, 9(4): 361-384.

137. Malone, E., Rasa, K., Cohen, D., Isaacson, T., Lashley, H., Lipson, H. (2004) "Freeform fabrication of 3D zinc-air batteries and functional electro-mechanical assemblies", *Rapid Prototyping Journal*, Vol. 10, No. 1, pp. 58-69.

138. Variano, E. A., McCoy, J. H., Lipson, H. (2003) "Emergence of modularity in stable dynamical networks", *Physical Review Letters,* Vol. 92, No 18.

139. Hornby G.S., Lipson H., Pollack. J.B. (2003) "Generative Encodings for the Automated Design of Modular Physical Robots", *IEEE Transactions on Robotics and Automation*, Vol. 19 No. 4, pp. 703-719.

140. Pollack, J. B., Hornby, G. S., Lipson, H., and Funes, Pablo (2003) "Computer Creativity in the Automatic Design of Robots". *Leonardo*, Journal for the International Society for Arts Sciences and Technology. Vol. 36 No. 2, pp. 115–121.

141. Lipson, H., Pollack, J.B., Suh, N.P. (2002) "On the Origin of Modular Variation", *Evolution* Vol. 56, No 8, pp. 1549-1556.

142. Pollack, J. B., Lipson, H., Funes, P., Hornby, G. (2001) "Three Generations of Coevolutionary Robotics", *Artificial Life*, Vol. 7, pp. 215-223.

143. Lipson, H. and Pollack, J. B. (2000) "Automatic design and Manufacture of Robotic Lifeforms", *Nature* 406, pp. 974-978.

144. Lipson, H. and Siegelmann, H. T. (2000) "Clustering irregular shapes using high order neurons", *Neural Computation* Vol. 12 No. 10, pp. 2331-2353.

145. Lipson, H., Shpitalni, M. (2000) "Conceptual Design and Analysis by Sketching", *Journal of AI in Design and Manufacturing*, Vol. 14, pp. 391-401.

146. Lipson, H. and Shpitalni, M. (1997) "On the Topology of Sheet Metal Parts", **Trans. Of ASME J. of Mechanical Design**, Vol. 120, No. 1, pp. 10-16.

147. Shpitalni, M. and Lipson, H. (1996) "Identification of Faces in a 2D Line Drawing Projection of a Wireframe Object," *IEEE Transactions on Pattern Analysis and Machine Intelligence*, Vol. 18, No. 10, pp. 1000-1012.

148. Lipson, H. and Shpitalni, M. (1996) "Optimization-Based Reconstruction of a 3D Object From a Single Freehand Line Drawing, *Journal of Computer Aided Design*, Vol. 28 No. 8, pp. 651-663.

149. Lipson, H. and Shpitalni, M. (1995) "A New Interface for Conceptual Design Based on Object Reconstruction from a Single Freehand Sketch", **Annals of the CIRP**, Vol. 45/1, pp.133-136.

Submitted papers (in review)

1. Benka, C., Gross, C., Gupta, R., & Lipson, H. (2023). Direct Robot Configuration Space Construction using Convolutional Encoder-Decoders. arXiv preprint arXiv:2303.05653.

2. Xiong, Z., Chen, L., Hao, W., Yang, P., Wang, S., Wilkinson, S. L., ... & Lipson, H. (2022). In-plane prestressed hair clip mechanism for the fastest untethered compliant fish robot. arXiv preprint arXiv:2207.08348.

3. Hu, Y., Chen, B., & Lipson, H. (2022). Egocentric Visual Self-Modeling for Legged Robot Locomotion. arXiv preprint arXiv:2207.03386.

4. Kwiatkowski, R., Hu, Y., Chen, B., & Lipson, H. (2022). On the Origins of Self-Modeling. arXiv preprint arXiv:2209.02010.

5. Xiong, Z., Guo, Z., Yuan, L., Su, Y., Liu, Y., & Lipson, H. (2023). Rapid grasping of fabric using bionic soft grippers with elastic instability.

Refereed Conference Proceedings

6. Chen, B., Hu, Y., Li, L., Cummings, S., & Lipson, H. (2021, May). Smile Like You Mean It: Driving Animatronic Robotic Face with Learned Models. In 2021 **IEEE International Conference on Robotics and Automation (ICRA)** (pp. 2739-2746). IEEE.

7. Chen, B., Hu, Y., Kwiatkowski, R., Song, S., & Lipson, H. (2021, May). Visual Perspective Taking for Opponent Behavior Modeling. In 2021 **IEEE International Conference on Robotics and Automation (ICRA)** (pp. 13678-13685). IEEE.

8. Chen, B., Chiquier, M., Lipson, H., & Vondrick, C. (2021). The Boombox: Visual reconstruction from acoustic vibrations. **Conference on Robot Learning (CoRL) 2021** arXiv:2105.08052.

9. O Chang, L Flokas, H Lipson, M Spranger "Assessing SATNet's Ability to Solve the Symbol Grounding Problem, Advances in **Neural Information Processing Systems** (**NeurIPS**), 2020

10. Chen, B., Li, Y., Raghupathi, S., & Lipson, H. (2021). Beyond Categorical Label Representations for Image Classification. International Confgerence on Learning Representations, **ICLR** 2021 *arXiv preprint arXiv:2104.02226*.

11. Xia, B., Fu, J., Zhu, H., Song, Z., Jiang, Y., & Lipson, H. (2021, May). A legged soft robot platform for dynamic locomotion. In 2021 **IEEE International Conference on Robotics and Automation (ICRA)** (pp. 11812-11819). IEEE.

12. Austin, J., Corrales-Fatou, R., Wyetzner, S., & Lipson, H. (2020, May). Titan: A parallel asynchronous library for multi-agent and soft-body robotics using Nvidia CUDA. In 2020 IEEE International Conference on Robotics and Automation (**ICRA**) (pp. 7754-7760). IEEE.

13. Feliz Y, P Jethani, P Jastrzebska-Perfect, H Lipson "The Case for a Portable Open-Source 3D Ultrasound: Issues, Benefits, and Challenges, 2019 IEEE International Ultrasonics Symposium (IUS), 506-520

14. Kwiatkowski, Robert, and Hod Lipson. "Zero Shot Learning on Simulated Robots." arXiv preprint arXiv:1910.01994 (2019).

15. Bullock, Delia, et al. "Automated Weed Detection in Aerial Imagery with Context." arXiv preprint arXiv:1910.00652 (2019).

16. Chang, Oscar, Lampros Flokas, and Hod Lipson. "Principled Weight Initialization for Hypernetworks." International Conference on Learning Representations. 2019

17. Chang, Oscar, et al. "Ensemble Model Patching: A Parameter-Efficient Variational Bayesian Neural Network." arXiv preprint arXiv:1905.09453 (2019)

18. DeChant, Chad, Seungwook Han, and Hod Lipson. "Predicting the accuracy of neural networks from final and intermediate layer outputs." ICML 2019 Workshop Deep Phenomena (2019)

19. Chang, Oscar, et al. "Agent Embeddings: A Latent Representation for Pole-Balancing Networks." Proceedings of the 18th International Conference on Autonomous Agents and MultiAgent Systems. International Foundation for Autonomous Agents and Multiagent Systems, 2019

20. R. Adam Bilodeau, Aslan Miriyev, Hod Lipson, Rebecca Kramer-Bottiglio, "All-Soft Material System for Strong Soft Actuators", IEEE International Conference on Soft Robotics 2018 (Livorno, Italy), 2018

21. Chang, O., Kwiatkowski, R., Chen, S., & Lipson, H. (2018). Agent Embeddings: A Latent Representation for Pole-Balancing Networks. arXiv preprint arXiv:1811.04516.

22. Chang, O., & Lipson, H. (2018, October). Balanced and Deterministic Weight-Sharing Helps Network Performance. In International Conference on Artificial Neural Networks (pp. 41-50). Springer, Cham.

23. Miriyev, A., Trujillo, C., Caires, G., & Lipson, H. (2018). Rejuvenation of soft material–actuator. **MRS Communications**, 1-6.

24. Chang, O., & Lipson, H. (2018). Neural Network Quine. **Artificial Life** 2018 (in review), (Trended #1 on Arxiv Sanity)

25. Chen, B., Wu, H., Mo, W., Chattopadhyay, I., & Lipson, H. (2018). Autostacker: A Compositional Evolutionary Learning System. **Genetic and Evolutionary Computation Conference (GECCO)** 2018, *accepted*.

26. Corucci, F., Cheney, N., Lipson, H., Laschi, C., & Bongard, J. (2016). Material properties affect evolution's ability to exploit morphological computation in growing soft-bodied creatures. In ALIFE XV, The Fifteenth International Conference on the Synthesis and Simulation of Living Systems, Late Breaking Proceedings (pp. 234-241).

27. Cheney, N., Bongard, J., SunSpiral, V., & Lipson, H. (2016). On the Difficulty of Co-Optimizing Morphology and Control in Evolved Virtual Creatures. In Proc. Artif. Life Conf (pp. 226-234).

28. Corucci, F., Cheney, N., Lipson, H., Laschi, C., & Bongard, J. (2016). Evolving swimming soft-bodied creatures. In ALIFE XV, The Fifteenth International Conference on the Synthesis and Simulation of Living Systems, Late Breaking Proceedings (p. 6).

29. I Labutov, K Luu, H Lipson, C Studer, Optimally Discriminative Choice Sets in Discrete Choice Models: Application to Data-Driven Test Design, Proceedings of the Third (2016) ACM Conference on Learning@ Scale, 149-152

30. Li, Y., Yosinski, J., Clune, J., Lipson, H., & Hopcroft, J. (2016). Convergent Learning: Do different neural networks learn the same representations?. In Proceedings of International Conference on Learning Representation (ICLR).

31. Cheney, N., Bongard, J., & Lipson, H. (2015, July). Evolving soft robots in tight spaces. In Proceedings of the 2015 annual conference on Genetic and Evolutionary Computation (pp. 935-942). ACM.

32. Understanding neural networks through deep visualization, J Yosinski, J Clune, A Nguyen, T Fuchs, H Lipson, arXiv preprint arXiv:1506.06579

33. Yosinski Jason, Clune Jeff, Bengio Yoshua, and Lipson Hod. (2014), "Quantifying the transferability of features in deep neural networks", in Advances in Neural Information Processing Systems (NIPS), Montreal, Quebec, Canada, December 8–11, 2014 (oral)

34. Lubatov I., Lipson H., "Crowdsourced Question Generation for Peer Assessment", ASESS 2014 (KDD)

35. Cheney, N., Clune, J., Lipson, H. (2014) "Evolved Electrophysiological Soft Robots". Proceedings of Artifical Life 14: The Fourteenth International Conference on the Simulation and Synthesis of Living Systems (ALife14). MIT Press

36. Cheney, N., Ritz, E., Lipson, H. (2014) "Automated Vibrational Design and Natural Frequency Tuning of Multi-Material Structures". Proceedings of the Genetic and Evolutionary Computation Conference (GECCO-2014). ACM.

37. Lee, S., Yosinski, J., Glette, K., Lipson, H., Clune, J. (2013) "Evolving Gaits for Physical Robots with the HyperNEAT Generative Encoding: The Benefits of Simulation Applications of Evolutionary Computing". pp 540 – 549. Proceedings of Evo*, Springer.

38. Lipton, J., MacCurdy, R., Boban, M., Chartrain, N., Withers III, L., Gangjee, N., Nagai, A., Cohen, J., Sobhani, K., Liu, J., Qudsi, H., Kaufman, J., Mitra, S., Garcia, A., McNicoll, A., Lipson, H. (2012) FAB@HOME Model 3: A More Robust, Cost Effective And Accessible Open Hardware Fabrication Platform. Proceedings of the Twenty Third Annual International Solid Freeform Fabrication Symposium – An Additive Manufacturing Conference, August 6-8, 2012, Austin, Texas, USA.

39. Lohmann, S., Yosinki, J., Gold E., Blum J., Lipson, H. (2012) "Arcana: An Open-Source Quadruped Platform for Evolutionary Robotics", Proceedings of the Artificial Life Conference, pp. 387-392.

40. Grouchy, P. and Lipson, H. (2012) "Evolution of Self-Replicating Cube Conglomerations in a Simulated 3D Environment", Proceedings of the 13th International Conference on the Simulation & Synthesis of Living Systems (ALife '13), pp. 59-66.

41. Cornforth, T.W. and Lipson, H. (2012) "Symbolic regression of multiple-time-scale dynamical systems", Genetic and Evolutionary Computation Conference (GECCO '12), pp. 735-742. *Best paper nominee*

42. Kurse, M.U., Lipson, H., and Valero-Cuevas, F.J. (2012) "Inference of compact analytical functions describing tendon routing in the fingers", Canadian Society of Biomechanics / Societe Canadienne de Biomechanique Conference (CSB/SBC), to appear.

43. Jiang, Y., Amend, J.R., Jr., Lipson, H., and Saxena, A. (2012) "Learning hardware agnostic grasps for a universal jamming gripper," IEEE International Conference on Robotics and Automation (ICRA), St. Paul, MN, May14-18.

44. Ly, D, L., Saxena, A. and Lipson, H. (2012) "Co-evolutionary Predictors for Kinematic Pose Inference from RGBD Images", ACM Genetic and Evolutionary Computation Conference (GECCO'12), pp. 967-974

45. Moriguchi, H. and Lipson, H. (2011) "Learning Symbolic Forward Models for Robotic Motion Planning and Control", European Conference on Artificial Life (ECAL'11), pp. 558-564.

46. Schmidt, M. D. and Lipson, H. (2011) "Automated Modeling of Stochastic Reactions with Large Measurement Time-Gaps", Proceedings of the Genetic and Evolutionary Computation Conference (GECCO '11), pp. 307-314.

47. Clune, J. and Lipson, H. (2011) "Evolving three-dimensional objects with a generative encoding inspired by developmental biology," Proceedings of the European Conference on Artificial Life.

48. Yosinski, J., Clune, J., Hidalgo, D., Nguyen, S., Cristobal-Zagal, J., Lipson, H. (2011) "Evolving Robot Gaits in Hardware: the HyperNEAT Generative Encoding Vs. Parameter Optimization," Proceedings of the European Conference on Artificial Life.

49. Amend, J.R., Jr. and Lipson, H. (2011) "freeLoader: An open source universal testing machine for high-throughput experimentation," ASME IDECT/CIE Conference, Washington, DC.

50. Yosinki, J., Clune, J., Hidalgo, D., Nguyen, S., Cristobal-Zagal, J., Lipson, H. (2011) "Generating Gaits for Physical Quadruped Robots: Evolved Neural Networks Vs. Local Parameterized Search", Genectic and Evolutionary Computation Conference (GECCO '11), poster presentation, pp. 31-32.

51. Cornforth, T.W., Torreson, J., Lipson, H. (2011) "Ion Channel Modeling with Analog Circuit Evolution," Genetic and Evolutionary Computation Conference (GECCO '11), poster presentation, pp. 33-34.

52. Tolley, M. T. and Lipson, H. (2011) "Programmable 3D stochastic fluidic assembly of cm-scale modules", IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2011), September 2011.

53. Ly, D, L. and Lipson, H. (2011) "Trainer Selection Strategies for Coevolving Rank Predictors", IEEE Congress on Evolutionary Computation (CEC'11), pp. 2392-2399.

54. Ly, D, L., Saxena, A. and Lipson, H. (2011) "Pose Estimation from a Single Depth Image for Arbitrary Kinematic Skeletons", RGB-D workshop in Robotics: Science and Systems (RSS'11), pp 37-38.

55. Neubert, J., Cantwell, A., Constantin, S., Kalontarov, M., Erickson, D., Lipson, H. (2010) "A Robotic Module for Stochastic Fluidic Assembly of 3D Self-Reconfiguring Structures", Proc. Int. Conf. on Robotics and Automation (ICRA), Anchorage AK, May 2010.

56. Garcia, R.F.M., Hiller, J.D., Lipson, H. (2010) "A vacuum-based bonding mechanism for modular robotics", Proc. Of the ICRA Workshop on Modular Robots, State of the Art, Anchorage, AK, May 2010, pp. 57-62.

57. Tolley, M. T., Lipson, H. (2010) "Fluidic Manipulation for Scalable Stochastic 3D Assembly of Modular Robots", Proc. Int. Conf. on Robotics and Automation (ICRA), Anchorage, AK, May.

58. Kurse, M.U., Schmidt, M., Lipson, H. and Valero-Cuevas, F.J. (2010) "Extracting Appropriate Mathematical Expressions Defining Moment Arm Relationships Using Symbolic Expression", Proceedings of the ASME 2010 Summer Bioengineering Conference (SBC 2010).

59. Neubert, J., Stockton, J., Blechman, B., Lipson, H. (2010) "Tetrabot: Resonance Based Locomotion for Harsh Environments", Int. Conf. on Intelligent Robots and Systems (IROS '10), Tapei, Rep. of China (Taiwan), October 2010, pp. 2431-2436.

60. Hiller, J and Lipson, H. (2010) "Evolving Amorphous Robots", 12th Int. Conference on Artificial Life (ALIFE XII), Odense, Denmark, August 2010, pp.797-802.

61. Richter, C. and Lipson, H. (2010) "Unethered Hovering Flapping Flight of a 3D Printed Mechanical Insect", 12th Int. Conference on Artificial Life (ALIFE XII), Odense, Denmark, August 2010, pp. 797-803.

62. Li, S., Yuan, J., Nigl, F., Lipson, H. (2010) "A Cuboctahedron Module for a Reconfigurable Robot", Int. Conf. on intelligent Robots and Systems (IROS '10), Taipei, Rep. of China (Taiwan), October 2010, pp. 535-541. ***Finalist for the IROS2010***

63. Lipton, J.I., Arnold, D. Nigl, F., Lopez, N., Cohen, D.L., Noren, N., Lipson, H. (2010) "Multi-Material Food Printing with Complex Internal Structure Suitable for Conventional Post-Processing", 21st Solid Freeform Fabrication Symposium (SFF '10), Austin, TX.

64. Tolley, M.T., Lipson, H. (2010) "Three Dimensional Stochastic Fluidic Assembly of Minimalistic Modules", McGill Center for Intelligent Machines Symposium on Brain, Body and Machine, Montreal, Canada, November.

65. Schmidt, M.D. and Lipson, H. (2010) "Predicting Solution Rank to Improve Performance", Genetic and Evolutionary Computation Conference (GECCO '10), pp. 949-956.

66. Schmidt, M.D. and Lipson, H. (2010) "Age-Fitness Pareto Optimization", Genetic and Evolutionary Computation Conference (GECCO '10), pp.543-544.

67. Lipton, J. Cohen, D., Lipson, H. (2009) "Brick Printing: Freeform Fabrication of Modular Architectual Elements with Embedded Systems" Solid Freeform Fabrication Symposium (SFF'09), Aug 3-5 2009, Austin, TX, USA.

68. Cohen D.L., Lipton, J., Cutler, M., Coulter, D., Vesco, A., Lipson, H. (2009) "Hydrocolloid Printing: A Novel Platform for Customized Food Production" Solid Freeform Fabrication Symposium (SFF'09), Aug 3-5 2009, Austin, TX, USA.

69. Mookerjee, A., Cohen, D.L., Peng, D.H., Bonassar, L.J., Lipson, H. (2009) "A Study of Variable Stiffness Alginate Printing for Medical Applications" Solid Freeform Fabrication Symposium (SFF'09), Aug 3-5 2009, Austin, TX, USA.

70. Lipton, J. Cohen,D., Heinz,M., Lobovsky, M., Parad,W., Bernstien, G., Li,T., Quartiere,J., Washington,K., Umaru,A., Masanoff,R., Granstein, J., Whitney,J., Lipson,H., (2009) "Fab@Home Model 2: Towards Ubiquitous Personal Fabrication Devices" Solid Freeform Fabrication Symposium (SFF'09), Aug 3-5 2009, Austin, TX, USA.

71. Zagal, J.C., Lipson, H. (2009) "Resilient Behavior through Controller Self-Diagnosis, Adaptation and Recovery", Performance Metrics for Intelligent Systems Workshop (PerMIS'09), Sept 21-23 2009, National Institute of Standards and Technology, Gaithersburg, Maryland USA.

72. Kim K. J., Lipson, H. (2009) "A robotic theory of mind in simulation", Performance Metrics for Intelligent Systems Workshop (PerMIS'09), Sept 21-23 2009, National Institute of Standards and Technology, Gaithersburg, Maryland USA.

73. Tolley, M. T., Hiller, J., Lipson, H. (2009) "Evolutionary Design and Assembly Planning for Stochastic Modular Robots ", Proc. IEEE/RSJ Int. Conf. Intelligent Robots and Systems (IROS), Exploring New Horizons in Evolutionary Design of Robots Workshop, Oct. 11-15 2009, St. Louis, MO, USA, pp. 73-78.

74. Hiller, J. and Lipson, H. (2009) "Fully Recyclable Multi-Material Printing", Solid Freeform Fabrication Symposium (SFF'09), Aug 3-5 2009, Austin, TX, USA.

75. Hiller, J. and Lipson, H. (2009) "Design Automation for Multi-Material Printing" Solid Freeform Fabrication Symposium (SFF'09), Aug 3-5 2009, Austin, TX, USA.

76. Hiller, J. and Lipson, H. (2009) "STL 2.0: A Proposal for a Universal Multi-Material Additive Manufacturing File Format" Solid Freeform Fabrication Symposium (SFF'09), Aug 3-5 2009, Austin, TX, USA.

77. Grossman, J., Parad, W., Lipson, H. (2009) "Design and Construction of a 6-DoF Fabrication Platform" Solid Freeform Fabrication Symposium (SFF'09), Aug 3-5 2009, Austin, TX, USA.

78. Alonso M.P., Malone E., Moon F.C., Lipson H. (2009) "Reprinting the Telegraph: Replicating the Vail Register using Multi-materials 3D Printing" Solid Freeform Fabrication Symposium (SFF'09), Aug 3-5 2009, Austin, TX, USA.

79. Amend, J.R., Jr. and Lipson, H. (2009) "Shape-Shifting Materials for Programmable Structures", Proceedings of the 11th International Conference on Ubiquitous Computing: Workshop on Architectural Robotics (Ubicomp Archibots 2009), Sept. 30 - Oct 3, Orlando, FL, USA.

80. Zagal J.C. and Lipson, H. (2009) "Towards Self-Reflecting Machines: Two-Minds in One Robot", Proceedings of the 10th European Conference on Artificial Life, ECAL 2009.

81. Hiller, J. and Lipson, H. (2009) "Rapid Manufacturing of Digital Materials", Rapid Manufacturing Conference, July 8-9, 2009, Loughborough, UK.

82. Li, S. and Lipson, H. (2009) "Vertical-Stalk Flapping-Leaf Generator For Parallel Wind Energy", Proceedings of the ASME/AIAA 2009 Conference on Smart Materials, Adaptive Structures and Intelligent Systems, SMASIS2009, "**Best Student Paper Award**" in "Bio-inspired Smart Materials and Structures" symposium and "**Honored Finalist Award**" on overall.

83. Kim, K.J. and Lipson, H. (2009) "Towards a Theory of Mind in Simulated Robots", Genetic and Evolutionary Computation Conference (GECCO'09), Montreal Canada, Late Breaking Paper.

84. Zagal, J. and Lipson, H. (2009) "Self-Reflection in Evolutionary Robotics: Resilient Adaptation with a Minimum of Physical Exploration", Genetic and Evolutionary Computation Conference (GECCO'09), Montreal Canada, Late Breaking Paper.

85. Schmidt, M.D. and Lipson, H. (2009) "Solving Iterated Functions Using Genetic Programming", Genetic and Evolutionary Computation Conference (GECCO'09), Montreal Canada, Late Breaking Paper.

86. Schmidt, M.D. and Lipson H. (2009) "Incorporating Expert Knowledge in Evolutionary Search: A Study of Seeding Methods", Genetic and Evolutionary Computation Conference (GECCO'09), Montreal Canada.

87. Schmidt, M.D. and Lipson, H. (2009) "Discovering a Domain Alphabet", Genetic and Evolutionary Computation Conference (GECCO'09), Montreal Canada.

88. Schmidt, M.D. and Lipson, H. (2009) "Symbolic Regression of Implicit Equations", Genetic Programming Theory and Practice (GPTP'09), Ann Arbor, MI.

89. Hiller, J. and Lipson, H. (2009) "Multi Material Topological Optimization of Structures and Mechanism", Genetic and Evolutionary Computation Conference (GECCO'09)

90. Zaga,l J.C. and Lipson, H. (2009) "Self-Reflection in Evolutionary Robotics: Resilient Adaptation with a Minimum of Physical Exploration", Proceedings of the Genetic and Evolutionary Computation Conference, Late Breaking Paper, (GECCO '09).

91. Lobo, D., Hjelle, D. A., Lipson, H. (2009) "Reconfiguration Algorithms for Robotically Manipulatable Structures," In Proceedings of ASME/IFToMM International Conference on Reconfigurable Mechanisms and Robots (ReMAR 2009), June 2009

92. Hjelle, D. A., Lipson, H. (2009) "A Robotically Reconfigurable Truss," In Proceedings of ASME/IFToMM International Conference on Reconfigurable Mechanisms and Robots (ReMAR 2009), June 2009.

93. Yee, B., Ning, Y., Lipson, H. (2009) "Augmented Reality In-Situ 3D Sketching of Physical Objects," In Hammond T., Eoff B., Corey P. (Eds.) Proceedings of Intelligent User Interfaces (IUI'09) Workshop on Sketch Recognition, Sanibel Island, FL, Feb 2009.

94. Aguilar, C. and Lipson, H. (2008) "A robotic system for interpreting images into painted artwork", Proceedings of the 11th Generative Art Conference (GA2008), Politecnico di Milano University, Milan, Italy, December 2008.

95. Tolley, M. T., Krishnan, M., Lipson, H., Erickson, D. (2008), "Advances Towards Programmable Matter", Proceedings of the 12th International Conference on Miniaturized Systems for Chemistry and Life Sciences (MicroTAS), San Diego CA, Oct. 2006, pp. 653-655.

96. Kriesel, D. M. M., Cheung, E., Sitti, M. and Lipson, H. (2008), "Beanbag Robotics: Robotic Swarms with 1-DoF Units", ANTS Conference 2008. pp. 267-274.

97. Lobovsky, M., Lobovsky, A., Behi, M., Lipson, H. (2008), "Solid Freeform Fabrication of Stainless Steel Using Fab@Home", Proceedings of the 19th Annual Solid Freeform Fabrication Symposium, Austin TX, Aug 2008.

98. Knapp, M., Wolf,f R., Lipson, H. (2008), "Developing printable content: A repository for printable teaching models", Proceedings of the 19th Annual Solid Freeform Fabrication Symposium, Austin TX, Aug 2008.

99. Cohen, D.L., Tsavaris, A., Lo W., Bonassa,r LJ, Lipson, H. (2008), "Improved Quality of 3D-Printed Constructs Through Enhanced Mixing of Alginate Hydrogels", Proceedings of the 19th Annual Solid Freeform Fabrication Symposium, Austin TX, Aug 2008.

100. Zykov, V., William, P., Lassabe, N., Lipson, H. (2008) "Molecubes Extended: Diversifying Capabilities of Open-Source Modular Robotics", IROS-2008 Self-Reconfigurable Robotics Workshop, 22-26.

101. Aguilar, C. and Lipson, H. (2008) "A robotic system for interpreting images into painted artwork," Proceedings of the 11th Generative Art Conference (GA 2008), Politecnico di Milano University, Milan, Italy, December 2008. (Movie)

102. Krishnan, M., Tolley, M.T., Lipson, H., Erickson, D. (2008), "Advances Towards Programmable Matter", Proceedings of the 12th International Conference on Miniaturized Systems for Chemistry and Life Sciences (Micro TAS), San Diego, CA, Oct. 2008, pp.635-655.

103. Tolley, M.T., Baisch, A., Krishnan, M., Erickson, D., Lipson, H. (2008) "Interfacing Methods for Fluidically-Assembled Microcomponents", Proceedings of IEEE International Conference on Micro Electro Mechanical Systems, Tuscon, AZ, January 2001, pp. 1073-1076.

104. Hiller, J. and Lipson, H., (2007) "Tunable Digital Material Properties for 3D Voxel Printers", Proceedings of the 19th Solid Freeform Fabrication Symposium, Austin TX, Aug 2008.

105. Chung, M., Malone, E., Tolley, M. T., Chepaitis, A. J., Lipson, H. (2008) "Object Augmentation for the Visually Impaired Using RP", Proceedings of the 19th Solid Freeform Fabrication Symposium, Austin TX, Aug 2008.

106. Schmidt, M. and Lipson, H. (2008) "Data-mining Dynamical Systems: Automated Symbolic System Identification for Exploratory Analysis", Proceedings of the 9th Biennial ASMA Conference on Engineering Systems Design and Analysis (ESDA08), Haifa, Israel, July 7-9, 2008.

107. Malone E. and Lipson H. (2008) "Multi-material Freeform Fabrication of Active Systems", Proceedings of the 9th Biennial ASMA Conference on Engineering Systems Design and Analysis (ESDA08), Haifa, Israel, July 7-9, 2008.

108. Vilbrandt, T., Malone, E., Lipson, H., Pasko, A. (2008) "Universal Desktop Fabrication", in Heterogeneous Objects Modelling and Applications, pp. 259-284.

109. Schmidt M. and Lipson H. (2007), "Learning Noise", Genetic and Evolutionary Computation Conference (GECCO'07), pp. 1680-1685. **** Best Paper Award ****

110. Krishnan, M., Tolley, M. T., Lipson, H., Erickson, D., (2007) "Directed Hierarchical Self Assembly - Active Fluid Mechanics at the Micro and Nanoscales", Proceedings of ASME International Mechanical Engineering Congress and Exposition (IMECE), Seattle WA, Nov. 2007, 41784. **** Best Presentation Award ****

111. Rieffel, J., Stuk, R., Valero-Cuevas, F., Lipson, H. (2007) "Locomotion of a Tensegrity Robot via Dynamically Coupled Modules". Proceedings of the International Conference on Morphological Computation, Venice Italy, March 2007.

112. Havener, R., Boyea, J., Malone, E., Bernards, D., DeFranco, J., Malliaras, G., Lipson, H. (2007) "Freeform Fabrication of Organic Electrochemical Transistors", Proceedings of the 18th Solid Freeform Fabrication Symposium, Austin TX, Aug 2007, pp.60-73.

113. Malone, E. and Lipson, H. (2007) "Freeform Fabrication of a Complete Electromechanical Relay", Proceedings of the 18th Solid Freeform Fabrication Symposium, Austin TX, Aug 2007, pp.513-526.

114. Periard, D., Malone, E., Lipson, H., (2007) "Printing Embedded Circuits", Proceedings of the 18th Solid Freeform Fabrication Symposium, Austin TX, Aug 2007, pp.503-512.

115. Periard, D., Schaal, N., Schaal, M., Malone, E., Lipson, H., (2007) "Printing Food", Proceedings of the 18th Solid Freeform Fabrication Symposium, Austin TX, Aug 2007, pp.564-574.

116. Zykov, V., Chan, A., Lipson, H. (2007) "Molecubes: An Open-Source Modular Robotics Kit", IROS-2007 Self-Reconfigurable Robotics Workshop, 3-6

117. Zykov, V. and Lipson, H. (2007) "Experiment Design for Stochastic Three-Dimensional Reconfiguration of Modular Robots", IROS-2007 Self-Reconfigurable Robotics Workshop, accepted.

118. Schmidt, M. and Lipson, H. (2007) "Comparison of Tree and Graph Encodings as Function of Problem Complexity", Genetic and Evolutionary Computation Conference (GECCO'07), pp. 1674-1679.

119. Estévez, N., Lipson, H. (2007) "Dynamical Blueprints: Exploiting Levels of System-Environment Interaction", Genetic and Evolutionary Computation Conference (GECCO'07), pp. 238-244.

120. Havener, R., Boyea, J., Malone, E., Bernards, D., DeFranco, J., Malliaras, G., Lipson, H. (2007) "Freeform Fabrication of Organic Electrochemical Transistors", Proceedings of the 18th Solid Freeform Fabrication Symposium, Austin TX, Aug 2007.

121. Malone, E. and Lipson H. (2007) "Freeform Fabrication of a Complete Electromechanical Relay", Proceedings of the 18th Solid Freeform Fabrication Symposium, Austin TX, Aug 2007.

122. Malone, E. and Lipson, H. (2007) "The Factory in your Kitchen", Proceedings of Mass Customization and Personalization (MCPC) 2007, Cambridge, MA, October 2007.

123. Lipson, H. (2007) "Printable 3D Models for Customized Hands-on Education", Proceddings of Mass Customization and Personalization (MCPC) 2007, Cambridge, MA, October 2007.

124. Tolley, M., Lipson, H., Erickson D. (2006) "Directed Fluidic Self-Assembly of Microscale Tiles", 10th International Conference on Miniaturized Systems for Chemistry and Life Sciences (MicroTAS '06), accepted.

125. Malone, E. and Lipson, H. (2006) "Fab@Home: The Personal Desktop Fabricator Kit", Proceedings of the 17th Solid Freeform Fabrication Symposium SFF'06, Austin TX, Aug 2006. **SFF Outstanding paper**

126. Schmidt, M.D. and Lipson, H. (2006) "Actively Probing and Modeling Users in Interactive co-Evolution", GECCO 2006, pp.385-386.

127. Studer, G and Lipson, H. (2006) "Analysis of Spontaneously emerging Self-Replicating Structures in Molecube Automata", Artificial Life 10, Bloomington, Indiana, USA June 3-7, 2006, pp.227-233.

128. Song, H., Guimbretière, F., Hu, C., Lipson, H. (2006) "ModelCraft: capturing freehand annotations and edits on physical 3D models", Proceedings of the 19th annual ACM symposium on User interface software and technology (UIST '06), Montreux, Switzerland, pp. 13 – 22.

129. Bongard, J., Zykov, V., Lipson, H. (2006) " Automated Synthesis of Body Schema Through Active Exploration", Artificial Life 10, Bloomington, Indiana, USA June 3-7, 2006, pp.220-226.

130. van Breugel, F., Regan, W., Lipson, H. (2006) "Evolving Hovering Flight on a Physical Ornithopter", Artificial Life 10, Bloomington, Indiana, USA June 3-7, 2006, pp.241-247.

131. Cohen, D. L., Malone, E., Lipson, H., Bonassar, L., (2005) "Direct Freeform Fabrication Of Pre-Seeded Alginate Hydrogel Constructs", Proceedings of ASME International Mechanical Engineering Congress and Exposition (IMECE '05), November 2005, Orlando, FL, USA.

132. Bongard, J., Lipson, H. (2005) "Automatic Synthesis of Multiple Internal Models Through Active Exploration", AAAI Fall Symposium: From Reactive to Anticipatory Cognitive Embodied Systems, November 2005.

133. Masry, M., Lipson, H. (2005) "A Sketch-Based Interface for Iterative Design and Analysis of 3D Objects", Proceedings of Eurographics workshop on Sketch-Based Interfaces, Dublin, Ireland, Aug 2005, pp. 109-118.

134. Berry, M., Malone, E., Lipson, H. (2005) "Freeform Fabrication of Zinc-Air Batteries with Tailored Geometry and Performance", Proceedings of the 16th Solid Freeform Fabrication Symposium, Austin TX, Aug 2005.

135. Paul, C. Lipson, H. Valero-Cuevas, F.J. (2005)"Redundancy in the Control of Robots with Highly Coupled Mechanical Structures", Int. Conf. on Intelligent Robots and Systems, Edmonton, Canada, August 2005, pp. 802-808.

136. Malone E., Lipson H., (2005) "Freeform Fabrication of Ionomeric Polymer-Metal Composite Actuators", Proceedings of the 16th Solid Freeform Fabrication Symposium SFF'05, Austin TX, Aug 2005. **Outstanding Paper Selection**

137. Paul C., Lipson H., Valero-Cuevas F. J. (2005) "Design of Tensegrity Robots for Fault Tolerant Locomotion" Proceedings of 12th International Conference on Advanced Robotics (ICAR), Seattle, Washington, USA, July 18th-20th. **Best Paper Award**

138. Paul C., Lipson H., Valero-Cuevas F. J. (2005) "Evolutionary Form-Finding of Tensegrity Structures" Proceedings of the 2005 Genetic and Evolutionary Computation Conference, June 2005, Washington D.C., U.S.A, pp. 3-10.

139. Bongard J., Lipson H., (2005) `Managed Challenge' Alleviates Disengagement in Co-evolutionary System Identification, Proceedings of the 2005 Genetic and Evolutionary Computation Conference, June 2005, Washington D.C., USA., pp. 531 – 538.

140. White, P., Zykov, V., Bongard, J., Lipson, H. (2005) "Three Dimensional Stochastic Reconfiguration of Modular Robots", Proceedings of Robotics Science and Systems, MIT, Cambridge MA, June 8-10, 2005.

141. Zykov, V., Bongard, J., Lipson, H. (2005) "Co-evolutionary Variance Can Guide Physical Testing in Evolutionary System Identification", Proceedings of the 2005 NASA/DoD Conference on Evolvable Hardware, June 2005, Washington D.C., USA.

142. Berenson, D., Esteves, N., Lipson, H. (2005) "Hardware Evolution of Analog Circuits for In-situ Robotic Fault-Recovery", Proceedings of the 2005 NASA/DoD Conference on Evolvable Hardware, June 2005, Washington D.C., USA.

143. Sullivan, J., Campbell M., Lipson, H. (2005) "Particle Filters as Exploration Tools for Autonomous Rovers," AIAA Guidance, Navigation and Control Conference, 2005.

144. Lipson, H., Bongard, J., Zykov, V. (2005) "Co-Evolutionary Methods in System Design and Analysis", 15th International CIRP Design Seminar, Shanghai, China.

145. Bongard, J. and Lipson, H. (2004) "Integrated Design, Deployment and Inference for Robot Ecologies", Proceedings of Robosphere (2004) November 2004, NASA Ames Research Center, CA USA.

146. Malone, E. and Lipson, H. (2004) "Solid Freeform Fabrication for Autonomous Manufacturing of Complete Robots", Proceedings of Robosphere 2004, November 2004, NASA Ames Research Center, CA USA.

147. Preble, S.F., Lipson, H., Lipson, M. (2004) "Novel two-dimensional photonic crystals designed by evolutionary algorithms", Proceedings of SPIE Volume: 5597, pp. 118-128.

148. Valero-Cuevas, F. J. and Lipson, H. (2004) "A computational environment to simulate complex tendinous topologies". In Proceedings of the 26th Annual International Conference of the IEEE EMBS, San Francisco, CA.

149. Masry, M., Kang, D. J., Susilo, I. and Lipson, H. (2004) "A Natural Freehand Sketching Interface for Progressive Construction of 3D Objects", AAAI Fall Symposium on Making Pen-Based Interaction Intelligent and Natural, pp. 98-105, October 2004.

150. Kang, D. J., Masry, M. and Lipson, H. (2004) "Reconstruction of a 3D Object From a Main Axis System", AAAI Fall Symposium on Making Pen-Based Interaction Intelligent and Natural, pp. 63-69, October 2004.

151. Zykov, V., Bongard, J., Lipson, H. (2004) "Evolving Dynamic Gaits on a Physical Robot", *Proceedings of Genetic and Evolutionary Computation Conference*, Late Breaking Paper, GECCO'04.

152. Malone, E., Lipson, H. (2004) "Freeform Fabrication of Electroactive Polymer Actuators in Electromechanical Devices", Proceedings of the 15th conference on Solid Freeform Fabrication, Austin TX, Aug 2003, pp. 697-708. **SFF Outstanding Paper**

153. Cohen. D.L., Malone. E., Lipson. H., Bonassar. L.J. (2004) "Multi-Tissue Direct Freeform Fabrication of Spatially Heterogeneous Biological Implants", Proceedings of the 15th conference on Solid Freeform Fabrication, Austin TX, Aug 2003, pp.720-731.

154. Bongard, J., Lipson, H. (2004), "Automated Damage Diagnosis and Recovery for Remote Robotics", IEEE International Conference on Robotics and Automation (ICRA04), pp. 3545-3550.

155. White, P. J., Kopansk,i K., Lipson, H. (2004) "Stochastic Self-Reconfigurable Cellular Robotics", IEEE International Conference on Robotics and Automation (ICRA04), pp. 2888-2893.

156. Bongard, J. C. and Lipson, H. (2004) "Automating Genetic Network Inference Using a Very Low Sampling Estimation-Verification Evolutionary Algorithm", Genetic and Evolutionary Computation Conference, (GECCO '04), pp. 333-345.

157. Mytilinaios, E., Marcus, D., Desnoyer, D, Lipson, H. (2004) "Designed and Evolved Blueprints for Physical Self-Replicating Machines", Ninth Int. Conference on Artificial Life (ALIFE IX), pp.15-20.

158. Lipson, H., Bongard, J., (2004) "An Exploration-estimation algorithm for synthesis and analysis of engineering systems using minimal physical testing", ASME Design Automation Conference (DAC04).

159. Bongard, J., Lipson, H. (2004) "Once More Unto the Breach: Automated Tuning of Robot Simulation using an Inverse Evolutionary Algorithm", Ninth Int. Conference on Artificial Life (ALIFE IX), pp.57-62.

160. Malone, E. and Lipson, H. (2004) "Functional Freeform Fabrication for Physical Artificial Life", Ninth Int. Conference on Artificial Life (ALIFE IX), pp.100-105.

161. Bongard, J.C., Lipson, H. (2004) "Automated Robot Function Recovery after Unanticipated Failure or Environmental Change using a Minimum of Hardware Trials", NASA/DoD conference on Evolutionary Hardware 2004, pp. 169-176

162. Malone, E., Rasa, K., Cohen, D., Isaacson, T., Lashley, H., Lipson, H. (2003) "Freeform fabrication of 3D zinc-air batteries and functional electro-mechanical assemblies", Proceedings of the 14th conference on Solid Freeform Fabrication, Austin TX, Aug 2003., pp.363-374.

163. Adams, B. and Lipson, H. (2003) "A universal framework for self-replication", European Conference on Artificial Life, ECAL'03, September 2003, Dortmund Germany, pp. 1-9.

164. Wyatt, D and Lipson H. (2003) "Finding Building Blocks Through Eigenstructure Adaptation", Genetic and Evolutionary Computation Conference (GECCO '03).

165. Malone, E. and Lipson, H. (2002) "Solid Free-Form Fabrication For Self-Sustained Robot Ecologies", Proceedings of Robosphere", 2002, pp. 93-98, Moffet Field, CA USA.

166. Lipson, H. and Shpitalni, M. (2002) "Correlation-based reconstruction of a 3D object from a single freehand sketch", 2002 AAAI Spring Symposium on Sketch Understanding, pp. 99-104, AAAI Press, Melno Park, CA.

167. Pollack, J. B., Lipson, H., Funes, P., Hornby, G. (2001) "Three Generations of Coevoluationary Robotics", Proceedings of Evolutionary Robotics ER'01.

168. Lipson, H., Pollack, J. B., Suh, N. P. (2001) "Promoting Modularity In Evolutionary Design", Proceedings of DETC'01 2001 ASME Design Engineering Technical Conferences, September 9-12, 2001, Pittsburgh, Pennsylvania, USA.

169. Hornby, G., Lipson, H., Pollack, J.B. (2001) Generative Evolutionary Design of Hierarchically Modular Physical Robots, *IEEE Conf. On robotics and Automation* ICRA 2001. Vol. 4, pp. 4146-51 (IEEE; Piscataway, NJ, USA).

170. Lipson, H. and Pollack, J. B. (2000) "Towards Continuously Reconfigurable Self-Designing Robotics", *IEEE conference on Robotics and Automation (ICRA2000),* Vol. 2, pp. 1761-6.

171. Lipson, H. and Pollack, J. B. (2000) "Evolving Physical Creatures", in *Proceedings of Artificial Life VII* (ALIFE7), (Eds.) M. A. Bedau, J. S. McCaskill, N. H. Packard, S. Rasmussen, Portland, OR, pp. 282-287.

172. Lipson, H. and Pollack, J. B. (2000) "Evolution of physical machines", *Proceedings of 6th International Conference on Artificial Intelligence in Design, AID'00,* pp. 269-285, 26-29 June 2000, Worcester Polytechnic Institute, Worcester, Massachusetts, USA.

173. Lipson, H. and Pollack J. B. (2000) "Towards fully automated design and manufacturing", *Proceedings of International CIRP Design Seminar* (DN2000), Haifa, Israel.

174. Pollack, J. B. and Lipson H. (2000) "The GOLEM Project: Evolving Hardware Bodies and Brains", The *Second NASA/DoD Workshop on Evolvable Hardware*, July 13-15, 2000, Palo Alto, California, USA.

175. Lipson, H. and Suh, N.P (2000) "A distributed design-component architecture for design search", *Proceedings of First International Conference on Axiomatic Design,* Boston MA.

176. Pollack, J.B., Lipson, H., Ficici, S., Funes, P., Hornby, G., Watson, R.A. (2000) "Evolutionary Techniques in Physical Robotics", *Third International Conference on Evolvable Systems: From Biology to Hardware (ICES2000).*

177. Pollack, J.B., Lipson, H., Funes, P., Ficici, S. G., and Hornby, G. (1999) "Coevolutionary Robotics", *The First NASA/DoD Workshop on Evolvable Hardware (EH'99).* John R. Koza, Adrian Stoica, Didier Keymeulen, Jason Lohn, eds., IEEE Press.

178. Shpitalni, M. and Lipson, H. (1998) "User interfaces for geometric modeling", in Kimura F. (Ed.) Geometric Modeling. Theoretical and Computational Basis towards Advanced CAD Applications. IFIP TC5/WG5.2 Sixth International Workshop on Geometric Modeling p. xi+372, 98-113.

179. Lipson, H., Shpitalni, M., Kimura, F., Goncharenko, I. (1998) "On-line Product Maintenance by Web-Based Augmented Reality", *New Tools and Workflows for Product Development*, pp. 131-143, Berlin, May 1998.

180. Shpitalni , M., Kimura , F. Goncharenko, I., Kato, S., Lipson, H. (1998) "Total Maintenance: Scope and Tools", *New Tools and Workflows for Product Development*, pp. 81-92, Berlin, May 1998.

181. Lipson, H. and Shpitalni, M. (1997) "Conceptual Design of Sheet Metal Products by Sketching", *Proc. of the Int. Conf. on Sheet Metal SheMet'98*, pp. 171-180, Enschede, Holland, April 7-9, 1998.

182. Kimura, F., Lipson, H., Shpitalni, M. (1997) "Engineering Environments in the Information Age - Research Challenges and Opportunities", *Annals of the CIRP,* Vol. 47/1, pp. 87-90.

183. Shpitalni, M. and Lipson, H. (1997) "Automatic reasoning for design under geometric constraints," *Annals of the CIRP*, Vol. 46/1, pp. 85-89.

184. Lipson, H., Hod, Y., Siegelmann, H.T (1997) "High-Order Clustering Metrics for Competitive Learning Neural Networks", Proceedings of the Israel-Korea Bi-National Conference on New Themes in Computer Aided Geometric Modeling, Tel-Aviv, Israel, Feb. 18-19, pp. 181-188.

185. Lipson, H. and Shpitalni, M. (1996) "An Interface for 3D Conceptual Design Based on Freehand Sketching," *Proceedings of the Israel-Germany Bi-National Conference on Computer Integrated Extended Manufacturing Enterprise*, pp. 141-150.

186. Lipson, H. and Shpitalni, M. (1996) "An Interface for 3D Conceptual Design Based on Freehand Sketching", *IFIP WG5.2 Workshop on Geometric Modeling in Computer-Aided Design*, pp. 139-148. (Results presented in extenso in Ref. 2 above.)

187. Lipson, H. and Shpitalni, M. (1996) "Decomposition of a 2D polygon into a minimal set of disjoint primitives", *CSG96 Conference on Set-Theoretic Solid Modeling*, Winchester, UK, April 1996, pp. 65-82.

188. Lipson, H. and Shpitalni, M. (1995) "A New Interface for Conceptual Design Based on Object Reconstruction from a Single Freehand Sketch," *Annals of the CIRP*, Vol. 45/1, pp. 133-136. **CIRP FW Taylor Medal**

Other conference papers

189. Studer G. and Lipson H. (2005) "Spontaneous emergence of self-replicating, competing cube species in physical cube automata", GECCO Late Breaking Paper.

190. Schmidt M. and Lipson H. (2005) "Co-evolution of Fitness Maximizers and Fitness Predictors", GECCO Late Breaking Paper.

191. Bongard J.B., Lipson H., (2005) "Reinventing the Wheel: Experiments in Evolutionary Geometry", GECCO Late Breaking Paper.

192. Anand, V., Lipson, H., Valero-Cuevas, F.J. (2005) "Blind Inference of Nonlinear Cable Network Topology from Sparse Data", GECCO Late Breaking Paper.

193. Lipson, H. (2004) "How to Draw a Straight Line Using a GP: Benchmarking Evolutionary Design Against 19th Century Kinematic Synthesis", GECCO Late Breaking Paper, GECCO 2004. **Silver Medal for Human Competitive Automated Invention**

194. Timm, R. W., Lipson, H. (2004) "Periodicity Emerges from Evolved Energy-Efficient and Long-Range Brachiation", *Proceedings of Genetic and Evolutionary Computation Conference*, Late Breaking Paper, GECCO'04.

195. Lipson, H. (2004) "Principles of Modularity, Regularity, and Hierarchy for Scalable Systems", *Genetic and Evolutionary Computation Conference* (GECCO'04) Workshop on Modularity, Regularity and Hierarchy.

Theses

196. Lipson, H. (1998) *An Interface For 3D Conceptual Design Based On Freehand Sketching*. *Ph.D. Thesis*, Mechanical Engineering Department, Technion – Israel Institute of Technology.

Books

Trade books and monographs

197. Lipson, H. and Kurman M. (2016) "Driverless: Intelligent cars and the road ahead", MIT Press

198. Lipson, H. and Kurman M. (2013) "Fabricated: The new world of 3D printing", Wiley Press.

199. Lipson, H. and Kurman M. (2010) "Factory@Home: The Emerging Economy of Personal Fabrication" Report Commissioned by the Whitehouse Office of Science & Technology Policy.

Edited Conference Proceedings

200. Hiroki Sayama, John Rieffel, Sebastian Risi, René Doursat and Hod Lipson (Eds.) *Artificial Life 14*, Proceedings of the Fourteenth International Conference on the Synthesis and Simulation of Living Systems (2014)

201. Lipson, H. and Thierens, D., et al., (Eds.): Genetic and Evolutionary Computation Conference, GECCO 2007, Proceedings, London, England, UK, July 7-11, 2007. ACM 2007, ISBN 978-1-59593-697-4.

202. Beyer, H.-G., O'Reilly, U.-M., Lipson, H., Blum, C., Dasgupta, D., Foster, J.A., Banzhaf, W., De Jong, E., Pelikan, M., Raidl, G., Deb, K., Zitzle,r E., Arnold, E., Tyrrel,l A., Cantu-Paz, E., Soule, T., Llora, X., Watson, J.-P., Bonabeau, E., Mancoridis, S. (Eds.): Genetic and Evolutionary Computation Conference, GECCO 2005, Proceedings, Washington DC, USA, June 25-29, 2005. ACM 2005, ISBN 1-59593-010-8.

203. Lipson, H, Antonsson, E.K., Koza, J.R. (Eds.) Computational Synthesis: From basic building blocks to high level functionality, Papers from 2003 AAAI Symposium, March 24-26, 2003, Stanford CA, AAAI Press, ISBN 1-57735-179-7.

Book Chapters

204. Lipson, H. (2008) "The Inevitable Magic of Artificial Life," in Pfeifer R., (Ed.) *The Rediscovery of Intelligence,* pp. 114-115.

205. Van Breugal, F., Teoh, Z.E., Lipson H. (2007) "A Passively Stable Hovering Flapping Micro Air Vehicle", in D. Floreano et al. (eds.), **Flying Insects and Robots**, pp. 171-184, Springer.

206. Lipson, H. (2007) "Curious and Creative Machines," in Pfeifer R., Bongard J.B., Lungarella (Eds.) *50 Years of AI*, Festschrift, LNAI 4850, pp. 316-320.

207. Lipson, H. (2005) "Evolutionary Design and Evolutionary Robotics", *Biomimetics*, CRC Press (Bar Cohen, Ed.), pp. 129-155.

208. Lipson, H. (2002) "Towards Synthetic Evolution of Nanostructures", in Chakraborty T., (Ed.) *Nano-Physics & Bio-Electronics - A new Odyssey,* pp. 341-352.

209. Pollack, J. B., Lipson, H., Ficici, S. G., Funes, P., Hornby, G., Watson, R.A. (2001). "Evolutionary Techniques in Physical Robots," in *Creative Evolutionary Systems*, Peter J. Bently and David W. Corne (eds). Morgan-Kaufmann, 2001, pp. 511-520.

210. Lipson, H. and Siegelmann, H.T. (2000), "High Order Eigentensors as Symbolic Rules in Competitive Learning", in S. Wermter, R. Sun (Eds.) *Hybrid Neural Systems*, Springer, LNCS 1778, pp. 286-297.

211. Shpitalni, M., Lipson, H., (1998), "Product Development and CAD/CAM", in F.L.Krause, Ed., *Product Modeling*, Verlag, Berlin.

Book reviews

212. Lipson, H. (2001) "Uncontrolled Engineering: A review of *Evolutionary Robotics*", *Artificial Life* 7/4, pp. 419-424, book review.

Issued Patents

1. 7,625,198 12/1/2009   Modular Fabrication Systems and Methods
2. 7,939,003 5/10/2011   Modular Fabrication Systems and Methods
3. 8,636,938 1/28/2014   Modular Fabrication Systems and Methods
4. 8,877,112 11/4/2014   Modular Fabrication Systems and Methods
5. 9,242,031 1/26/2016   Modular Fabrication Systems and Methods
6. ZL200980137301.6   Apparatus and Methods for Digital Manufacturing
7. 8,996,155 3/31/2015   Apparatus and Methods for Digital Manufacturing

8. 8,884,496 11/11/2014   Fluid Current Energy Capture Apparatus and Method
9. 9,556,947 1/31/2017   Bidirectional Gear, Method, and Applications
10. ZL 2011 8 0022498.6   9/16/2015   Bidirectional Gear, Method, and Applications
11. 9,079,337 7/14/2015   Systems and Methods for Freeform Fabrication of Foamed Structures
12. 8,882,165 11/11/2014   Gripping and Releasing Apparatus and Methods
13. 9,120,230 9/1/2015   Gripping and Releasing Apparatus and Methods
14. 9,723,866 8/8/2017   A System and Method for Solid Freeform Fabrication of Edible Food
15. 8,992,183 3/31/2015   System and Methods for Moving Objects Individually and in Parallel
16. 9,098,913 8/4/2015   Prediction of Successful Grasps by End of Arm Tooling
17. 9,487,387 11/8/2016   System and Methods for Actuation Using Electro-Osmosis
18. 9,579,219 2/28/2017   Robotic Apparatus, Method, and Applications

Invited Talks, Keynotes, and Colloquia

1. Invited Speaker, "The Next AI", CEO Annual Summit, Fort Lauderdale, April 1, 2023

2. Colloquium Speaker, "Self-Aware Machines", ME/CS Department, University of Illinois at Urbana Champaign, Champaign IL, March 30, 2023

3. Invited Speaker, "The Next AI", Singtel Executive Briefing, Singapore, March 22, 2023

4. Invited Speaker, "Artificial Intelligence and Robotics", YPO Executive Briefing, New York NY, March 14, 2023

5. Invited Lecture, "Automating Discovery", ETH Zurich, Zurich Switzerland, Dec 22, 2022

6. Keynote, "Artificial Intelligence and Robotics", Entrepreneurial Organization (EO) Delhi Chapter, New Delhi, India, Dec 16, 2022

7. Invited Speaker, "Artificial Intelligence and Robotics", Kentucky Fried Chicken (KFC) executive Briefing, San Francisco CA, Dec 1, 2022

8. Invited Speaker, "Artificial Intelligence and Robotics", HSM Summit, São Paulo, Brazil, Nov 23, 2022

9. Keynote, "The Next AI", Harman Automotive, Querétaro, Mexico, Oct 25, 2022

10. Invited Speaker, "Artificial Intelligence and Robotics", HSM Executive Briefing, São Paulo, Brazil, Oct 24, 2022

11. Keynote, "AI and Mobility", Novus Glass Summit 2022, Dallas Fort Worth, TX, October 20, 2022

12. Invited Speaker, "The Next AI", Singularity University Executive Program, San Francisco, CA, October 3, 2022

13. Keynote, "AI and Mobility", Fix Network Summit 2022, Quebec City, Canada Sep 29, 2022

14. Seminar, "The Next AI", U.N. Delegation on education, New York NY September 19, 2022

15. Invited Speaker, "The Next AI", Visa Corporation, Campos do Jordão, Brazil, June 28, 2022

16. Invited Speaker, "Artificial Intelligence and Robotics", Visa Corporation, São Paulo, Brazil, June 24, 2022

17. Invited Speaker, "The Next AI", Ventu Cotton, San Francisco, CA, June 17, 2022

18. Keynote, "Consciousness: The dawn of Machine awareness", European Commission Science Summit 2022, (online), May 11, 2022, June 14, 2022

19. Keynote, "The Six Waves of Artificial Intelligence", from Creative Collaborations Conference, Ben Gurion University, May 11, 2022, Be'er Sheva, Israel

20. Seminar Speaker, "Automating Discovery – From Cognitive Robotics to Systems Biology", ABC Robotics, Ben Gurion University, May 9, 2022, Be'er Sheva, Israel

21. Invited Speaker, "AI and Robotics", Kazakhstan YPO, Menlo Park CA, May 3, 2021

22. Invited Speaker, "Self-Aware Machines", Machine Learning, AI, Robotics and Space (MARS), Mar 29, 2022 Ojai Valley, CA

23. Keynote, "The Six Waves of Artificial Intelligence", Money Management Institute Annual Summit, Palm Beach FL, March 24, 2022

24. Invited Speaker, "Robotics and AI", NextEra executive retreat, March 23, 2022 (online)

25. Keynote, "Automating Discovery – From Cognitive Robotics to Systems Biology", NSF AI Institute on Dynamical Systems Launch, University of Washington, Mat 16, 2022, Seattle WA

26. Invited Speaker, "AI and Robotics", Singularity University Executive Program, Menlo Park CA, March 7, 2022

27. Invited Speaker, "Automating Discovery – From Cognitive Robotics to Particle Physics", Distinguished Lectures Seminar Series, University of Southern California, Feb 22, 2022 (online)

28. Invited Speaker, "The Six Waves of Artificial Intelligence", Money Management Institute Board of Directors, January 20, 2022 (online)

29. Invited Speaker, "Trends in AI and Robotics"", RFF Future of Space Operations, Online, January 12, 2022

30. Invited Speaker, "The Six Waves of Artificial Intelligence", SEAS Employee Engagement Speaker, New York NY, Dec 9, 2021

31. Invited Speaker, "The Six Waves of Artificial Intelligence", Alsea Board Meeting, Dec 9, 2021 (online)

32. Invited Speaker, "AI and Robotics", Singularity University Executive Program, Menlo Park CA, Nov 7, 2021

33. Invited Talk, "AI and CAD", Autodesk Advisory Board, Boston MA, Dec 2, 2021

34. Invited Speaker, "AI and Robotics", Singularity University Executive Program, Menlo Park CA, Nov 7, 2021

35. Invited Speaker, "Robotics and AI", Sony executive retreat, October 19, 2021 (online)

36. Invited Speaker, "Self-Modeling Systems", ICCV Simulation Technology for Embodied AI workshop, Oct 16, 2021 (online)

37. Keynote, "The four phases of Additive Manufacturing", NANO IL, Online, Oct 6, 2021

38. Invited Speaker, "Trends in AI and Robotics", University of Notre Dame Emerging Tech, Oct 1, 2021 (online)

39. Invited Speaker, Innovation Salon, Columbia Business School, "Trends in AI and Robotics", Sep 23, New York, NY

40. Invited Speaker, "Future of Mobility", Ernst & Young Disruptive Tech Series, Online, Sep 14, 2021

41. Invited Speaker, "The Next AI", Tiger 21 Board meeting, July 7, 2021

42. Invited Speaker, "Future of Mobility", Ernst & Young Disruptive Tech Series, Online, June 9, 2021

43. Invited Speaker and panelist, "Trends in AI and Robotics"", RFF Future of Space Operations, Online, April 27, 2021

44. Keynote, "Soft Actuators for Soft Robotics", Robosoft 2021, Online, April 16, 2021

45. Invited Speaker and panelist, "Self-Aware Machines", International Workshop on Embodied Intelligence, March 24, 2021

46. Keynote, "Trends in AI and robotics", New York Academy of Dentistry, Online, March 11, 2021

47. Keynote, "3D Printing: The Next 25 Years", CEO Webcast, Online, March 6, 2021

48. Keynote, "Future of AI and Robotics", ARPA-E Annual Fission Meeting, Online, Feb 23, 2021

49. Keynote, "Future of AI and Robotics", Arrow EMEA Leadership, Online, Feb 16, 2021

50. Invited Speaker, "Future of Mobility", Ernst & Young Disruptive Tech Series, Online, Feb 9, 2021

51. Keynote, "Artificial Intelligence: The Next 25 Years", Aditya Birla Group BizlabsNXT Digital AI Conclave, Online, Jan 28, 2021

52. Keynote, "Automating Discovery", Design Computing and Cognition (DCC) 2020, Online, Dec 14, 2020

53. Keynote, "Artificial Intelligence: The Next 25 Years", CEO Webcast, Online, Nov 30, 2020

54. Invited Speaker, "Future of Mobility", Ernst & Young Disruptive Tech Series, Online, Oct 26, 2020

55. Keynote, "Big Data in Manufacturing", Michigan Manufacturing Leadership Series, Online, Oct 8, 2020

56. Keynote, "Deep Learning in Computer Aided Design", Altair Global ATC, Online, Oct 6, 2020

57. Invited Speaker and panelist, "Future50: Leadership & Strategy in the age of AI", RFF, Online, Aug 26, 2020

58. Invited Speaker, "Can We Learn To Stop Worrying and Love AI?", American Society of Composers, Authors and Publishers (ASCAP) Lab Speaker Series, Online, Aug 25, 2020

59. Invited Speaker, "Automating Discovery"", Food and Drug Administration (FDA), Online, August 7, 2020

60. Invited Speaker, "Automating Discovery"", IEEE World Congress on Computational Intelligence (WCCI), Online, July 20, 2020

61. Invited Speaker, "Trends in Robotics and AI", Citibank Unstoppable Trends, July 29, 2020

62. Invited Speaker, "Trends in Robotics and AI", Procter & Gamble| Cincinnati, OH, Feb 25, 2020

63. Invited Speaker, Soft Robotics 2020, "Soft Actuators for Soft Robotics", Haifa Israel, Feb 5, 2020

64. Keynote, A360, "Autonomous Vehicles", Los Angeles, CA, Jan 20, 2020

65. Invited Speaker, CVC Annual Retreat, "Trends in Robotics and AI", Palm Beach FL, Jan 9, 2020

66. Keynote, Edge Connex Annual Retreat, "Trends in Artificial Intelligence", Washington DC, Dec 12, 2019

67. Invited Speaker, Envision 2020, "AI Ethics", Princeton NJ, Nov 22, 2019

68. Invited Speaker, Citibank Singapore, "Trends in Robotics and AI", Singapore, Nov 14, 2019

69. Keynote, 3D Printing and Beyond, "The four waves of Additive Manufacturing", Jerusalem Israel, Nov 7, 2019

70. Invited Speaker, Citibank Singapore, "Trends in Robotics and AI", Singapore, Nov 3, 2019

71. Keynote, WE Summit, "Self Aware Machines", Beijing, Nov 2, 2019

72. Keynote, Columbia Dental School, "Artificial Intelligence in Dentistry", New York NY, Sep 29, 2019

73. Invited Speaker, Citibank, "Trends in Robotics and AI", Santa Clara CA, Oct 22, 2019

74. Invited Speaker, Citibank Singapore, "Trends in Robotics and AI", Singapore, Sep 25, 2019

75. Keynote, Teacher's College, "AI in Education", New York NY, Sep 20, 2019

76. Keynote, Goldman Sachs investor retreat, "Trends in Artificial Intelligence", New York NY, Sep 19, 2019

77. Keynote, AkzoNobel Annual Summit, "Autonomous Vehicles", New Orleans, LA, Sep 18, 2019

78. Invited Speaker, LG, "Trends in 5G", Santa Clara CA, Sep 17, 2019

79. Invited Speaker, YPO Long Island, "Trends in Artificial Intelligence", Long Island NY, Sep 13, 2019

80. Keynote, Goldman Sachs investor retreat, "Trends in Artificial Intelligence", New York NY, Sep 12, 2019

81. Invited Speaker, Moody, "Trends in Artificial Intelligence", New York NY, Sep 10, 2019

82. Invited Speaker, Citibank Singapore, "Trends in Robotics and AI", Singapore, Aug 26, 2019

83. Keynote, Epigenetic Robotics, EPIROB 2019, "Cognitive Robotics", Oslo, Norway, Aug 20, 2019

84. Invited Speaker, Exxon Mobil, "Trends in Robotics and AI", Luanda, Angola, Aug 16, 2019

85. Keynote, tech HR, "Artificial Intelligence", Delhi, Aug 1, 2019

86. Invited Speaker, US DDI, "Trends in Robotics and AI", Washington DC, July 30, 2019

87. Invited Speaker, DDI, "Trends in Robotics and AI", Washington DC, July 30, 2019

88. Keynote, SAP Summit, "Artificial Intelligence", Philadelphia PA, July 24, 2019

89. Invited Speaker, Singularity University EIP, "Trends in Robotics and AI", Mountain View CA, July 22, 2019

90. Keynote, CARSTAR Annual Summit, "Autonomous Vehicles", Chicago IL, July 10, 2019

91. Keynote, BBVA Annual Retreat, "Machine Learning and Big Data", Madrid, Spain, June 26, 2019

92. Keynote, Cargill Annual Retreat, "Machine Learning and Big Data", Wichita KS, June 24, 2019

93. Invited Speaker, Italy Singularity Summit, "Machine Learning and Big Data", Rome, Italy, June 18, 2019

94. Keynote, IBIS Automotive Summit, "Artificial Intelligence and the automotive industry", Milan Italy, June 10, 2019

95. Invited Speaker, BWI GmbH, "Machine Learning and Big Data", Berlin Germany, June 4, 2019

96. Invited Speaker, Singularity University EIP, "Trends in Robotics and AI", Mountain View CA, May 20, 2019

97. Keynote, World Retail; Congress, "The Six Waves of AI", Amsterdam, Netherlands, May 15, 2019

98. Keynote, Canadian Assoc of Pharmacy, "The Six Waves of AI", Carlsbad, CA, May 7, 2019

99. Invited Speaker, Singularity University WE Family Event, "Trends in Robotics and AI", Mountain View CA, May 4, 2019

100. Invited Speaker, COBPEA, "Trends in Robotics and AI", Mountain View CA, April 29, 2019

101. Keynote, EO Global Leaders' Summit GLC, "The Six Waves of AI", Maccau, China, April 14, 2019

102. Invited Speaker, Booz Allen, "Trends in Robotics and AI", Washington DC, March 26, 2019

103. Invited Speaker, Temaseak, "Smart Cities", Singapore, March 20, 2019

104. Invited Speaker, Citibank Wealth Management, "Trends in Robotics and AI", Mountain View CA, March 13, 2019

105. Keynote, Lockheed Martin Retreat, "Trends in Robotics and AI", Dallas/Fort Worth, TX, March 6, 2019

106. Invited Speaker, Finish Posti, "Machine Learning and Big Data", Helsinki Finland, Feb 28, 2019

107. Keynote, AAWC, "AI in retail", The World Congress of the International Advertising Association, Kochi, India, Feb 22, 2019

108. Colloquium, Duke University Pearsall Lecture, "Automating Discovery", Durham NC, Feb 13, 2019

109. Invited Speaker, Elior Group, "Machine Learning and Big Data", Mountain View CA, Feb 6, 2019

110. Invited Speaker, DoD, "Machine Learning and Big Data", Mountain View CA, Jan 29, 2019

111. Keynote, Verifacts , "Driverless Cars and the Road ahead", Toronto Canada, Jan 23, 2019

112. Colloquium, Washington University, "Automating Discovery", Seattle WA, Jan 17, 2019

113. Invited Speaker, Quantonomics / Goldman Sachs, "The Six Waves of Artificial Intelligence", New York NY, Jan 10, 2019

114. Invited Speaker, YPO Gold , "The Six Waves of Artificial Intelligence", Zurich Switzerland, Dec 13, 2018

115. Invited Speaker, Schindler Exec Retreat, "The Six Waves of Artificial Intelligence", Lucerne Switzerland, Dec 12, 2018

116. Invited Speaker, Cargill, "Machine Learning and Big Data", Mountain View CA, Nov 9, 2018

117. Keynote, the Growth Faculty, "The Six Waves of Artificial Intelligence", Sydney Australia, Nov 15, 2018

118. Invited Speaker, Pactual Asset Management, "Machine Learning and Big Data", Mountain View CA, Nov 9, 2018

119. Keynote, Mexico Singularity Summit, "Machine Creativity", Puerto Valencia, Mexico, Nov 7, 2018

120. Invited Speaker, The Entrepreneur Network, "Machine Learning and Big Data", Mountain View CA, Nov 6, 2018

121. Colloquium, University of Connecticut, "Automating Discovery", UConn, Nov 5, 2018

122. Invited Speaker, Citibank 10x Strategy, "Artificial Intelligence in Finance", New York NY, Nov 1, 2018

123. Keynote, Entrepreneur Organization, "Machine Creativity", San Francisco CA, Oct 18, 2018

124. Keynote, Altair Summit, "Machine Creativity", Paris, France, Oct 17, 2018

125. Keynote, Deloitte Mexico, "AI in retail", Mexico City, Mexico, Oct 10, 2018

126. Invited Speaker, Jasonville Energy Authority, "Machine Learning and Big Data", Jacksonville FL, Oct 5, 2018

127. Invited Speaker, Equity Residential, "Machine Learning and Big Data", Mountain View CA, Oct 3, 2018

128. Keynote, Italy Summit, "Machine Creativity", Milan, Italy, Oct 2, 2018

129. Keynote, Agora Summit, "The Six Waves of Artificial Intelligence", Tucson Arizona, Sep 28, 2018

130. Invited Speaker, Exxon Mobil, "Machine Learning and AI", Houston TX, Sep 27, 2018

131. Invited Speaker, Raymond India, "Big Data", Mumbai India, Sep 26, 2018

132. Keynote, Deloitte Ireland, "The Six Waves of Artificial Intelligence", Dublin, Ireland, Sep 11, 2018

133. Invited Speaker, UPM, "Big Data", Mountain View CA, Aug 27, 2018

134. Keynote, Asia Pacific Global Impact Challenge, "The Six Waves of AI", Taiwan, Aug 10, 2018

135. Invited Speaker, A360, "Trends in Machine Learning and AI", Mountain View CA, July 30, 2018

136. Invited Speaker, Singularity University, Executive Program, "Trends in Robotics and AI", Mountain View CA, July 22, 2018

137. Invited Speaker, CASVI, "Trends in Machine Learning and AI", Mountain View CA, July 18, 2018

138. Keynote, FAB14, "Food Printing", Toulouse, France, July 16, 2018

139. Invited Speaker, Google/Australia, "Trends in Machine Learning and AI", Mountain View CA, July 12, 2018

140. Invited Speaker, Singularity University, Exponential Innovation Program, "Trends in Robotics and AI", Mountain View CA, July 9, 2018

141. Invited Speaker, LG Academy, "5G", Mountain View CA, June 11, 2018

142. Keynote, Positive Impact, "The Six Waves of Artificial Intelligence", Milan, Italy, June 20, 2018

143. Keynote, Accenture, "The Six Waves of Artificial Intelligence", Frankfurt Germany , June 13, 2018

144. Invited Speaker, Peoplefund, "Trends in Machine Learning and AI", Mountain View CA, June 11, 2018

145. Invited Speaker, Google/Singapore, "Machine Learning and AI", Mountain View CA, June 7, 2018

146. Invited Speaker, Exxon Mobil, "Machine Learning and Digital Twins", Houston TX, June 6, 2018

147. Keynote, STEP Miami, "Artificial Intelligence", Miami FL, May 31, 2018

148. Guest Speaker, Unilever, "The Six Waves of Artificial Intelligence", Palo Alto CA, May 29, 2018

149. Keynote, 21 Foundation, "Artificial Intelligence and Robotics", Tokyo Japan, May 24, 2018

150. Invited Speaker, Barclays Bank, "The Six Waves of Artificial Intelligence", London UK, May 18, 2018

151. Keynote, Inter-American Development Bank (IDB), "Autonomous Vehicles and the road ahead", Washington DC, May 17, 2018

152. Keynote, Young Professional Organization (YPO), Dallas Chapter, "Artificial Intelligence", Dallas, TX, May 10, 2018

153. Guest Speaker, Singularity Executive training program, "Artificial Intelligence and Robotics", Moffet Field CA, May 6, 2018

154. Keynote, Executive Program Toronto, "AI and Robotics", Toronto ON, May 1, 2018

155. Keynote, Young Professional Organization (YPO) of Switzerland, "Artificial Intelligence", Geneva, Switzerland, April 26, 2018

156. Guest Speaker, Legal & General Investment Management America, Inc. (LGIMA), "Trends in Data Science", Chicago IL, April 17, 2018

157. Guest Speaker, Singularity Executive training program, "Artificial Intelligence and Robotics", Moffet Field CA, March 25, 2018

158. Guest Speaker, Grupo Salinas Executive retreat, "Artificial Intelligence", Mexico City, Mexico, March 22, 2018

159. Keynote, Singularity University Czech Summit, "Curious and Creative Machines", Prague, Czech Republic, March 6, 2018

160. Keynote, Latham & Watkins Annual Summit, "Trends in Artificial Intelligence", New York NY, March 2, 2018

161. Invited Talk, Grupo Bal Retreat, "Trends in Artificial Intelligence and Robotics", San Francisco CA, Feb 28, 2018

162. Guest Speaker, Citibank Private Bank, "Artificial Intelligence", Mexico City, Mexico, Feb 22, 2018

163. Colloquium, Iowa State University Food Science Department, "Food Printing", Des Moines IA, Feb 14, 2018

164. Invited Talk, Exxon Mobile Executive training, "Trends in Artificial Intelligence and Robotics", Houston TX, Feb 20, 2018

165. Colloquium, Columbia University Astrophysics Department annual Radical Hypothesis Lecture, "Robot Scientists", New York NY, Feb 14, 2018

166. Invited Talk, Google/Scandinavia "The four exponentials of Artificial Intelligence", Mountain View CA, Feb 13, 2018

167. Keynote, Syracuse Research Corporation (SRC) "The six waves of Artificial Intelligence", Syracuse NY, Feb 9, 2018

168. Keynote, Barclays Bank Summit, "The Compounding Exponentials of AI", London, UK, Feb 8, 2018

169. Guest Speaker, The Executive Network (TEN), "Artificial Intelligence and Robotics", Mountain View CA, Feb 6, 2018

170. Guest Speaker, Singularity Executive training program, "Artificial Intelligence and Robotics", Moffet Field CA, Jan 30, 2018

171. Guest Speaker, Citibank Private Bank, "Artificial Intelligence", New York NY, Jan 24, 2018

172. Invited Talk, Singularity University Summit, "Artificial Intelligence", Brussels, Belgium, Jan 23, 2018

173. Keynote, Deloitte Future of Retail Summit, "AI and retail", New York NY, Jan 16, 2018

174. Invited Talk, SEAS Alumni Event, "the Six Waves of Artificial Intelligence", New York NY, Jan 16, 2018

175. Invited Talk, Jardine Matheson, "Artificial Intelligence and Robotics", Mountain View, CA, Jan 10, 2018

176. Keynote, Stuyvesant High School Annual Splash, "Artificial Intelligence and Robotics", New York NY, Dec 16, 2017

177. Invited Talk, Deloitte Partner meeting "Artificial Intelligence and Robotics", Dallas, TX, Dec 7, 2017

178. Invited Talk, Raizen "Trends in Artificial Intelligence and Robotics", Mountain View, CA, Nov 16, 2017

179. Keynote, NY Annual conference on Manufacturing an Innovation, NEXT 17, "The six waves of Artificial Intelligence", Syracuse NY, Nov 17, 2017

180. Invited Talk, Citibank Financial, "Trends in Artificial Intelligence and Fintech", Mountain View, CA, Nov 16, 2017

181. Keynote, Tencent Annual Summit, "AI, Creativity, and Free Will", Chengdu, China, Nov 8, 2017

182. Invited Talk, Bridge 37, "Trends in Artificial Intelligence and Robotics", Mountain View, CA, Nov 1, 2017

183. Keynote, Citibank private bank summit, "Trends in Artificial Intelligence and Robotics", Shanghai, China, Oct 19, 2017

184. Invited Talk World Knowledge Fair (WKF 2017), "How 3D Printing will change our Future", Seoul, Korea, Oct 18, 2017

185. Invited Talk World Knowledge Fair (WKF 2017), "The Fourth Industrial Revolution and the future of Manufacturing", Seoul, Korea, Oct 17, 2017

186. Keynote, AI and Society, "The Six Waves of Artificial Intelligence", Tokyo, Japan, Oct 10, 2017

187. Invited Talk, Exxon Mobile Executive training, "Trends in Artificial Intelligence and Robotics", Houston TX, Oct 3, 2017

188. Invited Talk, "Stanley Black & Decker, The four exponentials of Artificial Intelligence", Mountain View CA, Sep 28, 2017

189. Keynote, PricewaterhouseCoopers (PWC) partner annual summit, "Trends in Artificial Intelligence", Banff, Canada, Sep 27, 2017

190. Invited Talk, Banco Bilbao Vizcaya Argentaria, BBVA "Artificial Intelligence in fintech", , Mountain View CA, Sep 20, 2017

191. Invited Presentation, Worlds Fair Nano Main Stage: "The Future of Robots", Brooklyn NY, Sep 16, 2017

192. Keynote, Canadian Autobody Conference, "Will driverless cars need collision repair?", St John's, Newfoundland, Canada, Sep 15, 2017

193. Keynote, Altair User Summit, "Curious and Creative Machines", Los Angeles CA, Sep 13, 2017

194. Keynote, Bosch Future of Urban Mobility, "The future of Mobility", London UK, Sep 8, 2017

195. Invited Talk, Google Norway, "The four exponentials of Artificial Intelligence", Mountain View CA, Aug 30, 2017

196. Invited Talk, "Trends in Artificial Intelligence", NEC AgTech, Mountain View CA, Aug 29, 2017

197. Invited Talk, "Trends in Artificial Intelligence", Inter-American Development Bank, Mountain View CA, Aug 25, 2017

198. Invited Talk, "The future of Mobility", NBC, Rosewood Sand Hill, CA, Aug 24, 2017

199. Invited Talk, "Driverless cars and the road ahead", Bosch China, Shanghai China, Aug 7, 2017

200. Keynote, "Curious and Creative Machines", GEEK PARK Rebuild 2017 Summit, Beijing China, Aug 5, 2017

201. Invited Talk, "Driverless cars and the road ahead", GEEK PARK Rebuild 2017 Summit, Beijing China, Aug 5, 2017

202. Invited Talk, "Artificial Intelligence in retail", AB InBev, New York NY, Aug 1, 2017

203. Keynote, ACM/Eurographics Symposium on Computer Animation (SCA) '17, "Self Simulating Systems", Los Angeles, CA, July 28, 2017

204. Keynote, Genetic and Evolutionary Computation Conference, "Adversarial Coevolution", Berlin, Germany, July 19, 2017

205. Invited Talk, "This Six Waves of AI", Comfama, Mofffet Field CA, June 22, 2017

206. Invited Talk, "This Six Waves of AI", Oracle, Mountain View CA, June 20, 2017

207. Invited Talk, "Trends in Artificial Intelligence and Robotics", Vix, Key Largo, FL, June 13, 2017

208. Invited Talk, "Trends in Artificial Intelligence and Robotics", Googleplex, Mountain View CA, June 12, 2017

209. Keynote, GE Global Research, "Trends in Additive Manufacturing", Niskayuna, NY, June 6 2017

210. Keynote, Earnest Young Compliance & Technology Forum, "Robotics, cognitive computing and machine learning — the fad or the future?", New York NY, May 17, 2017

211. Invited Talk, Dyson, "Trends in Artificial Intelligence", Pa   lo Alto, CA, May 16, 2017

212. Invited Presentation, Guild 21, "Autonomous Vehicles: Will we need body shops?", (online), May 11, 2017

213. Invited Talk, Thales, "Trends in Artificial Intelligence", Palo Alto, CA, May 4, 2017

214. Keynote, Deming Forum, "The Six Waves of Artificial Intelligence", Columbia Business School, New York NY, May 2, 2017

215. Invited Talk, Inter Dev Bank (IDB), "Trends in Artificial Intelligence", Boston MA, April 22, 2017

216. Keynote, Automotive Dealer Council Meeting, "Driverless Cars and the road ahead", Miami FL, April 21, 2017

217. Invited Talk, Singularity University IPP, "Convergence: Driverless Cars and AI", Dan Francisco, CA March 30, 2017

218. Keynote, The Rubin Museum of Art, "AIs and Avatars", New York, NY, March 29, 2017

219. Invited Talk, Singularity University Executive Program, "Driverless Cars and the future of the city", Palo Alto, CA March 23, 2017

220. Invited Talk, Singularity University Executive Program, "Digital Manufacturing", Palo Alto, CA March 21, 2017

221. Invited Talk, APS meeting, "The Robotic Scientist", New Orleans LA, March 17, 2017

222. Keynote, Tate & Lyle Texturant, "Print and Eat – The story behind food printing", Chicago IL, March 8, 2017

223. Invited Talk, Deutsche Telekom, "Artificial Intelligence", Bonn, Germany, March 3, 2017

224. Keynote, Cultiv8, "Print and Eat – The story behind food printing", Monterey, CA, March 1, 2017

225. Invited Talk, Next Era, "Trends in Artificial Intelligence", Palm Beach FL, Feb 2, 2017

226. Invited Talk, Steelcase, "Trends in Artificial Intelligence", Palo Alto CA, Jan 18, 2017

227. Keynote, Deloitte Executive Training, "The compounding exponentials of Artificial Intelligence", New York NY, Jan 17, 2017

228. Keynote, Inside 3D Printing, "Additive Manufacturing – The next 25 years", San Diego, CA, Dec 14, 2016

229. Keynote, Turkey Innovation Week, "The compounding exponentials of Artificial Intelligence", Istanbul, Turkey, Dec 10, 2016

230. Keynote, Credit Swiss Bank, "The compounding exponentials of Artificial Intelligence", Zurich, Switzerland, Dec 5, 2016

231. Colloquium, "Driverless cars and the road ahead", Villanova University, Villanova, PA, Dec 2, 2016

232. Keynote, Israel Aerospace Industries, "Additive Manufacturing – The next 25 years", Tel Aviv, Israel, Nov 24, 2016

233. Keynote, ASME ICME, "Automating Discovery in Mechanical Engineering", Haifa, Israel, Nov 21, 2016

234. Keynote, CTO Forum Rethink Disruption, "The compounding exponentials of Artificial Intelligence", Half Moon Bay, CA, Nov 4, 2016

235. Invited panelist, Citibank autumn dialogs, "Artificial Intelligence", San Francisco CA, Nov 2, 2016

236. Invited Briefing, Deutsche Telekom Board of directors, "Robotics and AI", (via skype) Oct 28, 2016

237. Keynote, Holmes Global PR Summit, "The compounding exponentials of Artificial Intelligence", Miami, FL, Oct 26, 2016

238. Invited Talk, Leadership organization of chief executives (YPO), "Exponential Trends in Robotics", Palo Alto, CA, Oct 24, 2016

239. Invited Presentation, The Rubin Museum of Art, "'Chasing Consciousness", New York, NY, Oct 21, 2016

240. Invited Talk, Global Commercial Real Estate Association (SIOR), "Driverless cars and real estate", New York, NY, Oct 21, 2016

241. Colloquium, Purdue University, Mechanical Engineering, "Automating Discovery", West Lafayette, IN, October 20,   2016

242. Keynote, Kroger Inc. Strategic retreat, "Trends in Artificial Intelligence", Cincinnati OH, October 5, 2016

243. Keynote, Eli Lilly Strategic retreat, "Trends in Artificial Intelligence", Mexico City, Mexico, September 28, 2016

244. Colloquium, NYU Tandon School of Engineering, "Automating Discovery", Brooklyn NY, September 27, 2016

245. Keynote, Harman International Strategic Management, "Robotics and Artificial Intelligence", Montreal, Canada, September 20, 2016

246. Invited Talk, Singularity Summit, "Robotics and Artificial Intelligence", Amsterdam, Netherlands, September 12, 2016

247. Invited Talk, RWE, "Robotics and Artificial Intelligence", Essen, Germany, August 22, 2016

248. Invited Talk, Weber Shandwick, "Trends in AI", New York NY, August 2, 2016

249. Invited Talk, Google NY, "Automatic Scientific Discovery", New York NY, August 1 2016

250. Panel, Northeast ME Chairs meeting, "Makerspaces in ME Education", University of Pennsylvania Mechanical Engineering Dept., Philadelphia, PA, July 29, 2016

251. Invited Talk, "Exponential trends in Robotics", Hershey, PA, June 28 2016

252. Invited Talk, "Exponential trends in Artificial Intelligence", AXA, New York NY, June 14 2016

253. Invited Talk, "Can a robot turn a canvas into a masterpiece?", Google Conference on Computer Generated Art, San Francisco CA, June 1, 2016

254. Invited Talk, "Trends in Additive Manufacturing", US Air Force Research Lab (AFRL), Dayton OH, May 26 2016

255. Panel, "Self-awareness", NY Academy of Sciences, New York NY May 23, 2016

256. Colloquium, "Trends in Additive Manufacturing", ETH Zurich, Zurich Switzerland, May 17, 2016

257. Keynote, "Robotics in Manufacturing", Singularity University Exponential Manufacturing, Boston MA, May 10, 2016

258. Colloquium, "Automating Discovery: The robot Scientist", Stanford University Biomedical Engineering Department, Palo Alto CA, May 9, 2016

259. Colloquium, "Automating Discovery: The robot Scientist", TCNJ, College of Engineering, April 20, 2016

260. Plenary, "Can a robot turn a canvas into a masterpiece?", MIT Conference on Computational Fabrication, Boston MA, April 19, 2016

261. Invited Talk, "Robotics and AI", NexGen, Hong Kong, China April 13, 2016

262. Keynote, "Trends in 3D Printing", Stratasys event, Denver CO, April 1, 2016

263. Invited Talk, "Trends in Robotics", Dutch Royal Airforce retreat, Rotterdam Netherlands, March 31, 2016

264. Colloquium, "Automating Discovery: The robot Scientist", University of Texas Southwestern Medical Center, Dallas TX, March 18, 2016

265. Invited Talk, "Exponential Trends in AI", Procter & Gamble, Cincinnati OH, March 2, 2016

266. Invited Talk, "Exponential Trends in Robotics", Walmart Corp, March 1, 2016

267. Keynote, "Trends in Artificial Intelligence", Tec De Monterrey, Mexico City, Mexico, December 3, 2015

268. Invited Talk, "Exponential Trends in Robotics", Singularity University, Johannesburg, South Africa, Nov 17, 2015

269. Plenary, "Creative Machines", MIT Technology Review Annual Conference, Boston MA, November 3, 2015

270. Keynote, "Food Printing", Food Vision USA, Chicago IL, October 29, 2015

271. Invited Talk, "The future of 3D Printing", Makerbot Industries, Brooklyn NY, Oct 27, 2015

272. Invited Talk, "Robotics and AI", Singularity University, Moffet Field CA, Oct 19, 2015

273. Colloquium, "Automating Discovery", University of Rochester, Computer Science Department, Rochester NY, October 14, 2015

274. Keynote, "Additive Manufacturing for Long Term Care", OnLok Sustainable Long Term Care Conference, UCSF, October 8, 2015

275. Invited Seminar, "AI And Robotics", Naspers Media Retreat, San Francisco, CA, Septermber 3, 2015

276. Keynote, "3D Printing - The next 25 Years", Stratasys User Forum, Seoul, Korea, Aug 28, 2015

277. Keynote, "3D Printing - The next 25 Years", Stratasys User Forum, Tokyo Japan, Aug 27, 2015

278. Keynote, "3D Printing - The next 25 Years", Stratasys User Forum, Shanghai China, Aug 25, 2015

279. Invited Talk, "3D Printing - The next 25 Years", USG/CENTRA, Washington DC, Aug 19, 2015

280. Keynote, "3D Printing - The next 25 Years", ASME AM3D, Boston MA, Aug 3, 2015

281. Invited Talk, "Print and Eat - Challenges and Opportunities in Food Printing", Florida Academy of Nutrition and Dietetics, Orlando FL, July 15, 2015

282. Keynote, "3D Printing - The next 25 Years", Select Bio, Boston MA, June 8, 2015

283. Keynote, "3D Printing - The next 25 Years", Potter County School District, June 17, 2015

284. Keynote, "3D Printing - The next 25 Years", Nikkei Global ICT Summit, Tokyo Japan, June 9, 2015

285. Invited Talk, "Self-Aware Systems", Northrop Grumman, Los Angeles, June 3, 2015

286. Invited Talk, "The Future of Robotics and AI", Barclays Bank retreat, Johannesburg, May 27, 2015

287. Keynote Speaker, "Automated Modeling of Dynamical Systems", SIAM Conference on Applications of Dynamical Systems, Snowbird, UT, May 21, 2015

288. Invited Talk, "The Future of Robotics and AI", Caterpillar Retreat, Peoria IL, May 20, 2015

289. Keynote, "3D Printing - The next 25 Years", BBC Executive Forum, New York, NY May 7, 2015

290. Invited Talk, "Print and Eat - Challenges and Opportunities in Food Printing", General Mills Inc., Minneapolis, MN, May 5, 2015

291. Keynote, "3D Printing- The next 25 Years", Materialse Annual User Forum, Brussels, Belgium, April 23, 2015

292. Keynote, "3D Printing- The next 25 Years", Shenzhen Innovation Fair, Shenzhen, China, April 19, 2015

293. Invited Talk, "3D Printing- The next 25 Years", The DOW Chemical Company, Houston Tx,, April 7, 2015

294. Colloquium Speaker, "Sentient Robotics", Georgia Tech Robotics Institute, Atlanta GA, March 4, 2015

295. Keynote Speaker, "The Next 25 Years of 3D Printing", Tissue Engineering & Bioprinting: Research to Commercialization Conference, Boston, MA, Feb 9-10, 2015,

296. Colloquium Speaker, "The Next 25 Years of 3D Printing", Clarkson University, Mechanical Engineering Sept, Potsdam NY, Feb 6, 2015

297. Invited Speaker, "Sentient Robotics", Baidu BIG Talk, San Francisco CA, Jan 30, 2015

298. Keynote Speaker, "3D printing materials", Welding, Joining and Additive Manufacturing International Conference (WJAM), Tel Aviv, Israel, January 18-20, 2015

299. Invited Speaker, "Print and Eat: The future of Food printing", Food Systems Global Summit, Cornell University, Dec 8, 2014

300. Invited Speaker, "The Future of 3D Printing", 3M, St. Paul MN, Nov 7 2014

301. Keynote Speaker, "3D printing materials", New Horizons in 3D Printing and Digital and Additive Manufacturing, Stony Brook, Long Island, NY, Sep 30, 2014

302. Invited Speaker "The Robot Scientist", Annual meeting of the NAE, Mechanical Engineering Section, Washington DC, September 29, 2014

303. Colloquium Speaker, "Automated discovery", Princeton University ME Dept, Princeton NJ, Sep 19, 2014

304. Keynote Speaker, "The Future of 3D Printing", DoD workshop on Multifunctional Materials, Arlington VA, Aug 18, 2014

305. Keynote Speaker, "The next 225 Years of 3D Printing", Solid Freeform fabrication (SFF) 14, Austin TX, Aug 5, 2014

306. Invited Plenary Speaker, "The Robotic Scientist", Unconventional Computation & Natural Computation (UCNC) 2014, London ON, Canada, July 15, 2014

307. Invited Speaker, "3D printing materials", Wyss Symposium: Adaptive Bioinspired Materials, Boston MA, June 27, 2014

308. Plenary Beacon Lecturer, "Food Printing", Institute of Food Technologists (IFT) Annual Meeting, New Orleans, LA June 23, 2014

309. Invited speaker, "Printing electronics", Futurapolis, May 17, Toulouse France

310. Invited Speaker, "The Future of 3D Printing", Science and Engineering Festival, Washington DC, April 24, 2014

311. Invited Speaker, "3D Printing: The promise and Peril", James Madison University, Harrisonburg VA, April 24, 2014

312. Invited Speaker, "3D printing in Nanotechnology", Nano 2014, Tel Aviv, Israel, March 25, 2014

313. Colloquium Speaker, "Food printing", Hebrew University, Food Science Dept, Israel, March 23, 2014

314. Keynote Speaker, "The future of 3D printing in Education", Society for Information Technology and Teacher Education (SITE), Jacksonville, FL March 18, 2014

315. Annual Winegard Visiting Lecturer, "The future of 3D printing: Principles and technologies", University of Guelph, March 13, 2014, Guelph ON, Canada

316. Invited Speaker, "Additive Manufacturing as a Transformative Manufacturing Technology", 2014 AAAS Annual Meeting, Chicago IL, Feb 13-17, 2014

317. Colloquium Speaker, "Additive Manufacturing as a Transformative Manufacturing Technology", Carnegie Mellon University Robotics Institute, Pittsburg PA, Nov 22, 2013

318. Congress Wide Plenary, "The future of 3D printing", ASME 2013 Mechanical Engineering Congress & Exposition, San Diego, California, November 15-21, 2013

319. Keynote Speaker, "Thinking outside the CAD box: Geometric design in the age of 3D printing", SIAM Conference on Geometric and Physical Modeling (GD/SPM 13), Denver, Colorado, November 11 – 14, 2013.

320. Keynote, "The future of 3D printing: Principles and technologies", Juniata College, Nov 6, 2013, Huntingdon, PA

321. Invited Speaker, "The future of 3D printing: Principles and technologies", BP Headquarters, Oct 30, 2013, Houston TX

322. Invited Speaker, "What do robots dream of? What we can learn from how machines view themselves", Industry Leader forum, Oct 29, 2013, New York NY

323. Keynote Speaker, "Automating Scientific Discovery: Distilling Natural Laws from Experimental Data, from particle physics to computational biology", Volen Center for Complex Systems retreat, Woods Hole, MA, Oct 18, 2013

324. Keynote Speaker, "The future of 3D printing: The promise and peril of a machine that cam make (almost) anything", Toulouse, France, Oct 12, 2013

325. Invited Speaker, "Automating Scientific Discovery: Distilling Natural Laws from Experimental Data, from Robotics to Material Science", AIRBUS, Toulouse, France, Oct 11, 2013

326. Colloquium speaker, "The future of 3D Printing", Columbia School of Architecture and Design, September 27, 2013.

327. Colloquium speaker, "Automating Discovery", Columbia Mechanical Engineering Department, September 27, 2013.

328. Keynote, "The future of 3D printing", Maker Faire, Toronto ON, Canada, Sep 21, 2013

329. Colloquium, "The future of 3D Printing", Mechanical Engineering Department, Northwestern Polytechnical University, Xi'an, China, June 28, 2013

330. Invited Speaker, "The future of 3D Printing", 2013 International Forum on New Industry Revolution & Additive Manufacturing, Chinese Mechanical Engineering Society, Beijing, China, June 26, 2013

331. Invited Speaker, "The future of 3D Printing", American Chamber of Commerce-China, Beijing, June 25, 2013

332. Keynote Speaker, "Digital Fashion", 1st International Conference on Digital Fashion, London College of Fashion, London, UK, May 16 – 17, 2013.

333. Invited Speaker, National Academy of Sciences' Committee on Science, Technology, and Law (CSTL), Washington, DC, May 13, 2013.

334. Invited Colloquium, "Scientific Data Mining", Complex Systems, University of Alaska Anchorage, Feb 15, 2013

335. Invited Colloquium, "Scientific Data Mining", Complex Systems, SUNY Binghamton, Binghamton NY, Feb 11, 2013

336. Invited Colloquium, "Accelerating Discovery", Electrical Engineering Department, Technion - Israel Institute of Technology, Haifa, Israel, Dec 12, 2012

337. Invited Review Lecturer, Israel Physical Society Conference, "Accelerating Discovery", Hebrew University, Jerusalem, Israel, Dec 9, 2012

338. Invited Speaker, "Jamming Matter for robotics applications", US-Israel Emerging Technology Discussions, Boson MA, Nov 28, 2012

339. Invited Speaker, "Matter Compilers", DMC 2012, Orlando FL, Nov 26, 2012

340. Invited Speaker, "The Future of 3D Printing", NEXT: The Event for Technology, Manufacturing & Innovation, Syracuse, November 8, 2012.

341. Invited Speaker, "Citizen Science ", AAAI Fall meeting, Washington DC, Nov 2, 2012

342. Invited Speaker, "Jamming Robotics ", U of Chicago, Oct 28, 2012

343. Invited Colloquium, "Scientific Data Mining", Stockholm University, Sweden, Oct 9, 2012

344. Invited Colloquium, "Scientific Data Mining", EPFL, Lausanne Switzerland, Oct 8, 2012

345. Invited Speaker, "The Robotic Scientist", Northwestern, Chicago IL. Oct 1, 2012

346. Plenary Gilberth Speaker, "Programmable Matter—The Shape of Things to Come", National Academy of Engineering, Washington DC, Sep 30, 2012

347. keynote Speaker, "Digital Matter", Betascape 2012, Sep 22, 2012

348. Invited Colloquium, "Scientific Data Mining", Harvard University Applied Physics Dept, Boston MA, Sep 21, 2012

349. Invited Colloquium, "Scientific Data Mining", Harvard University Systems Biology Dept, Boston MA, Sep 20, 2012

350. Invited Speaker, "Self Reflecting Robotics", Annual Academy of Management meeting, Boston MA, Aug 4, 2012

351. Invited Speaker, "Evolutionary Robotics", Institute for Advanced Studies summer school in Theoretical Physics, Princeton NJ, July 19, 2012

352. Invited Speaker, "Digital Matter", Singularity University 2012, San Jose CA, Jun 26, 2012

353. Invited Speaker, "The new world of 3D printing", IdeaCity 2012, Toronto ON, Jun 13, 2012

354. Invited Speaker, "The Robotic Scientist", Stanford SLAC, Palo Alto CA. June 4, 2012

355. Invited Speaker, "Design in the age of 3D printing", Architectural Design Symposiyum, London UK, May 11, 2012

356. Invited Speaker, "Biologically Inspired Robotics", USA Science & Engineering Festival (USASEF), Washington DC, April 27, 2012

357. Invited Speaker, "Design in the age of 3D printing", Design for Manufacturing Forum, Brooklyn NY, April 26, 2012

358. Invited Speaker, "Eureqa!", Microsoft Think Next, Tel Aviv, Israel, April 22, 2012

359. Invited Speaker, "Matter Compilers – Design in the age of 3D printing", Congress on the future of Engineering Software (COFES), Scottsdale AZ, April 13, 2012

360. Invited Symposium X Speaker, "Programmable Matter—The Shape of Things to Come", MRS Annual meeting, San Francisco CA, April 12, 2012

361. Seminar Speaker, "The Robotic Scientist", Caltech Astronomy Dept, Pasadena CA. April 11, 2012

362. Colloquium Speaker, "Automating Scientific Discovery", Brandeis University CS Dept, Waltham MA, April 5, 2012

363. Invited Speaker, "Automating Scientific Discovery", Signal processing and inference for the physical sciences, Royal Society, London UK, March 26, 2012

364. Invited Speaker, "Symbolic Data Mining", NECSI, Cambridge MA, Feb 17, 2012

365. Invited Speaker, "Bioinspired Robotics", Forum Informatik, Aachen, Germany, Jan 23, 2012

366. Invited Speaker, "My Robot is Smarter Than Yours: Cognitive Robotics and AI", Swissnex, San Francisco CA, January 19, 2012

367. Colloquium Speaker, "Programmable Matter", Rochester Inst. Of Technology, Rochester NY, Oct 26, 2011

368. Colloquium Speaker, "Machine Science", Princeton Plasma Physics Laboratory, Princeton NJ, Oct 25, 2011

369. Invited Speaker, "Data mining biological Systems", New Frontiers in Systems Biology, Rehovoth, Israel, Oct 3, 2011

370. Invited Speaker, "Frontiers in Additive Manufacturing", NAE US Frontiers of Engineering, Palo Alto, CA, September 19, 2011

371. Invited Speaker, "Programmable Matter", Perimeter Institute, Hawking wing opening ceremony, Waterloo ON, September 18, 2011

372. Invited Speaker, "Fab@Home", Maker Fair, Queens, NY, September 17, 2011

373. Colloquium Speaker, "Machine Science", Vanderbilt University, Nashville TN, Sep 8, 2011

374. Invited Speaker, "Machine Science", Acceleration Discovery: Human Computer Symbiosis 50 Years On, Park City, UT, July 25, 2011

375. Invited Speaker, "Reverse Engineering Stochastic Systems", Uncertainty in Artificial Intelligence (UAI11), Barcelona, Spain, July 16, 2011

376. Invited Plenary, "Reverse Engineering Dynamical Systems", International Conference on Complex Systems (ICCS 2011), Cambridge MA, June 27, 2011

377. Keynote Speaker, "Analysis by Synthesis", 2011 IEEE Congress on Evolutionary Computation (CEC 2011), New Orleans, LA, June 9, 2011

378. Invited Speaker, "Bioinspired Robotics", World Science Fest (WSF11), New York NY, June 4, 2011

379. Invited Plenary, "Soft Robotics", European Commission Future and Emerging Technologies (FET11), Budapest Hungary, May 5, 2011

380. Invited Panelist, "3D Printing Technologies", 3D/DC, Washington DC, April 28, 2011

381. Colloquium Speaker, "The Robotic Scientist", Union College CS Dept., Schenectady NY, April 21, 2011

382. Colloquium Speaker, "Reverse Engineering Dynamical Systems", University of Chicago Computation Institute, Chicago IL, March 7, 2011

383. Keynote Speaker, "Self Reflective Systems", Int. Workshop on Self Organizing Systems, Karlsruhe, Germany, February 24, 2011

384. Invited Speaker, "Bioprinting", American Association for the Advancement of Science (AAAS11), February 21, 2011

385. Invited Speaker, "Self Reflective Robotics", American Association for the Advancement of Science (AAAS11), February 19, 2011

386. Invited Speaker, "The Limits of Science", Science on Saturday Lecture Series, Princeton Plasma Physics Laboratory, January 29, 2011

387. Colloquium Speaker, "Self Reflective Machines", Psychology Dept., Indiana University, Bloomington IN, January 24, 2011

388. Colloquium Speaker, "Distilling Natural Laws from Experimental Data", Physics Dept., Weizmann Inst, of Science, Rehovoth, Israel, Dec 30, 2010

389. Colloquium Speaker, "Digital Materials", Pixel Club, Computer Science Dept., Technion - Israel Inst. of Technology, Haifa Israel, Dec 28, 2010

390. Invited Seminar, "Reverse Engineering Dynamical Systems", Los Alamos National Labs, Albuquerque NM, Dec 8, 2010

391. Keynote Speaker, "Mining Dynamical Systems - From Cognitive Robotics to Computational Biology", European Conference on Machine Learning (ECML 2010), Barcelona, Spain, September 22, 2010

392. Invited Speaker, "Automating Science", Philosophical Society of Washington, Washington DC, September 10, 2010.

393. Colloquium Speaker, "Analysis by Synthesis", Computer Science Dept, École Polytechnique Fédérale de Lausanne (EPFL) , Lausanne, Switzerland, September 5, 2010

394. Keynote Speaker, "Analysis by Synthesis", 9th International Conference on Evolvable Systems (ICES 2010), York, UK, September 6, 2010

395. Plenary Speaker, "Soft Evolutionary Robotics", 12th International Conference on the Synthesis and Simulation of Living Systems (ALIFE XII), Odense, Denmark, August 20, 2010

396. Invited Speaker, "Rapid Assemblers", Fab6, Amsterdam, Netherland, August 18, 2010

397. Invited speaker, "Automating Scientific Discovery", Princeton Institute for Advanced Studies, Princeton NJ, 15 April 2010

398. Invited speaker and panelist, "Self Reflective Architecture", Columbia Graduate School of Architecture, New York NY, 12 April 2010

399. Invited Speaker, "3D Printing for biological applications," in Biofabrication: Biomedical Application of Rapid Prototyping, University of South Carolina, Charleston SC, March 19, 2010

400. Keynote Speaker, "The Robotic Scientist" IEEE Aerospace Conference, Big Sky MT, March 8, 2010

401. Colloquium Speaker, "A factory in your classroom", University of Virginia School of Education "Tea and Technology" seminar Series, Charlottesville VA, March 4, 2010

402. Invited Plenary Speaker, "The Robotic Scientist", Simposium Internacional de Sistemas Computacionales y Tecnologías de Información (SISCTI '10), Monterrey, Mexico, February 26, 2010

403. Invited Speaker, "The robotic Scientist", The Perimeter Institute, Waterloo ON, Canada, February 3, 2010

404. Invited Plenary Speaker, "Automated Design and Control of experiments", 16th Lab Automation Conf., Palm Springs CA, January 25, 2010

405. Invited Speaker, "The robotic Scientist", Foresight Institute, Palo Alto, CA, January 16, 2010

406. Invited keynote speaker, "A factory in your classroom", National Tech Leadership Summit, Punahou School, Honolulu HI, January 7-8, 2010

407. Colloquium Speaker, "Self-reflective Systems", Harvard Graduate School of Architecture, Cambridge MA, November 12, 2009

408. Invited Speaker, "Robot Evolution", Quantum to Cosmos Festival, The Perimeter Institute, Waterloo ON, Canada, October 22, 2009

409. Invited Keynote Speaker, "Reverse Engineering Dynamical Systems", Fourteenth Portuguese Conference on Artificial Intelligence, EPIA 2009, Aveiro, Portugal, October 12, 2009

410. Invited Keynote Speaker, "From Analog to Digital 3D printing", Fourth International Conference on Advanced research in Virtual and Rapid Prototyping, VRAP 2009, Leiria, Portugal, October 10, 2009

411. Invited Colloquium, "Self-reflective and self-fabricating robotic systems", Robotics Institute, Tufts University, Boston MA, September 24, 2009

412. Invited Keynote Speaker, "Self-reflective Systems", EuropeanConferebce on Artificial Life (ECAL 2009), Budapest, Hungary, September 14, 2009

413. Invited talk, "Self-reflective machines", Idea City '09, Toronto, Canada, June 18, 2009

414. Invited talk, "Bioinspired Robotics", Emerging Technologies Pavilion, International Robots, Vision & Motion Control exhibition, June 10, Chicago IL, 2009

415. Invited speaker, UPE Cool Math & Computing Seminar, "Mining Experimental Data from Dynamical invariants – From Cognitive Robotics to Computational Biology", Department of Computer Science, SUNY Binghamton, Binghamton, NY, May 8, 2009

416. Invited Seminar, "3D Printing for Tissue Engineering Applications", South Carolina bioengineering symposium, Columbia SC, April 14, 2009

417. Invited speaker, The Goldstein Lecture Series, "Self-Reflection and Self-Fabrication in robotic systems", Technion, Israel Institute of Technology, Haifa, Israel, March 25, 2009

418. Invited Seminar, "Self-Reflection and Self-Fabrication in robotic systems", Ben Gurion University, Be'er Sheva, Israel, March 24, 2009

419. Invited Seminar, "Robotic self-reflection and self-assembly", Robotics Institute, Carnegie Mellon University, Pittsburg PA, February 6, 2009

420. Invited Beckman Series Speaker, "Mining experimental data for dynamical invariants, from cognitive robotics to computational biology", Caltech, Pasadena CA, Nov 20, 2008

421. Invited Colloquium, "Mining experimental data for dynamical invariants, from cognitive robotics to computational biology" Department of Computer Science, Austin TX, Nov 7, 2008

422. Invited Colloquium, "Evolutionary Robotics" Computer Science Dept, Wells College, Aurora NY, October 31, 2008

423. Keynote presentation, "A Factory in Your Kitchen: On multi-material 3D-printing and the future of personal fabrication" International Workshop on Microfactories, Northwestern University, Evanston Illinois, October 6, 2008

424. Invited Colloquium, "Mining freeform naturals laws in dynamical data" Department of Biological Statistics and Computational Biology, Cornell University, October 1, 2008

425. Invited Colloquium, "Mining freeform naturals laws in dynamical data" Department of Biological Statistics and Computational Biology, Cornell University, October 1, 2008

426. Invited SHARP Seminar Speaker, "What do robots dream of? On cognitive machines and other self-modeling systems", NYU, NY, Sep 24, 2008

427. Invited CS/BME Colloquium Speaker, "Mining experimental data for dynamical invariants – from robotics to biomechanics and computational biology", USC, Los Angeles CA, Sep 8, 2008

428. Invited talk, Foundation of Nanoscience 2008, "Dynamically reprogrammable self-assembly at macro and micro scales", Snowbird, Utah, April 2008

429. Invited Colloquium, Santa Fe Institute, "Mining experimental data for physical laws", Santa Fe, NM, March 2008

430. Invited talk, "The future of personal fabrication", University of Pennsylvania Wharton School of management, Philadelphia PA, January 2008

431. Invited talk, NSF Engineering Research and Innovation Annual Meeting, Top advances and Emerging Areas, "Resilient machines", January 2008, Knoxville TN

432. Invited talk and panel, NSF Engineering Research and Innovation Annual Meeting, "Working with the Media", January 2008, Knoxville TN

433. Invited presentation, Light in Winter 2008, "What do robots Dream of", January 2008, Ithaca NY

434. Colloquium Speaker, Chicago University, Physics Dept, "Cognitive Robotics and other self-modeling systems", December 2007

435. Colloquium Speaker, Delaware University Biomechanics Dept Colloquium, "Biologically inspired robotics", November 2007

436. Invited Plenary Address, "Emergent Self Models in Machines", Epigenetic Robotics 2007, November 2007, Rutgers NJ

437. Colloquium Speaker, Cornell University Cognitive Science Colloquium., "Biologically inspired robotics", October 2007

438. Invited seminar, "Biologically inspired robotics", Free University of Brussels CS Dept., Brussels, Belgium, Sep 2007

439. Invited seminar, "Emergent Self Models in Machines", University of Malaga CS Dept., Malaga, Spain, Sep 2007

440. I Invited Speaker, "Multimaterial Freeform Fabrication", Symposium on Digital Fabrication, MIT, Cambridge MA, May 2007

441. Invited Plenary Address, "Emergent Self Models in Machines", Annual meeting of The Human Behavior and Evolution Society, May 2007, Williamsburg, Virginia

442. Colloquium Speaker, Carnegie Mellon University, Mechanical Engineering Dept., "Biologically inspired robotics", February 2007

443. Invited 4-lecture series, "Evolutionary Robotics", Spring school on cognitive science and artificial intelligence, Günne at Lake Möhne, Germany, March 2007

444. Invited plenary speaker, "Robotics Innovations", TED / Technology & Design, Monterey, CA, March 2007

445. Invited Speaker, "Machine Minds", International Symposium on Creating Brain-Like Intelligence, Honda Research Institute Europe, Hohenstein, Germany, February 2007

446. Invited talk, "Reverse engineering biological networks", Computational & Theoretical Biology Symposium, Rice University, December 2006

447. Colloquium, "Biologically Inspired Robotics", Computer Science Dept, Harvard University, November 2006

448. Invited speaker, "Biologically Inspired Robotics", Evolving Life Life Evolving, Namur, Belgium, December 2006

449. Colloquium Speaker, "Biologically Inspired Robotics", Mechanical & Aerospace Engineering Dept, Vanderbilt University, October 2006

450. Invited Colloquium Speaker, "Emergent Self-models in Machine Minds", Sage Center, University of California at Santa Barbara, October 2006

451. Invited Keynote Speaker, "Evolutionary Robotics", Dana-Farber Cancer Institute Annual retreat, Boston, October 2006.

452. Invited Speaker, "Multimaterial Freeform Fabrication", Symposium on Digital Fabrication, Pretoria, South Africa, June 2006

453. Invited Speaker, "Evolutionary Robotics and Evolutionary Design ", 50th Anniversary Summit of Artificial Intelligence, Monte Verita, Switzerland, July 2006

454. Invited Keynote Speaker, "Biologically Inspired Robotics", Robocup 2006, Bremen, Germany, June 2006

455. Invited Keynote Speaker, "Co-evolutionary Learning in Embodied Cognitive Agents", Artificial Life X, Bloomington, Indiana, USA June 2006

456. Invited Keynote Speaker, "Co-evolutionary embedded systems", The 9th International Conference on Intelligent Autonomous Systems (IAS-9), Tokyo Japan, March 2006

457. Invited Speaker and Panelist, "Automating Discovery", W.M.Keck Institute Roundtable on future directions in science, Los Angeles CA, May 2006

458. Colloquium Speaker, "Biologically Inspired Robotics: From evolving to Self-Replicating Machines", College of Engineering, University of Vermont, April 2006

459. Colloquium Speaker, "Automating Discovery", Department of Pharmacology, University of Texas, Feb 2006

460. Special Seminar Speaker, "Biologically Inspired Robotics: From evolving to Self-Replicating Machines", Mechanical Engineering Department, Indian Institute of Technology (IIT) Kanpur, January 2006

461. Invited Presenter and Panelist, "Science & Technology Revolutions", Renaissance Weekend, Charleston SC, Dec 2005

462. Invited Plenary Keynote Speaker, "Print Anything: The future of rapid prototyping", Annual retreat, Lexmark Inc., Lexington, KY, Nov 2005

463. Invited Colloquium, "Co-evolutionary Methods in System Design and Analysis", Exxon-Mobile Upstream Research Company, Huston TX, Nov 2005

464. Invited Colloquium, "Evolving Engineering Systems", Rockefeller University, New York NY, Nov 2005

465. Invited Speaker, "3D Printing Functional Systems", Symposium on Digital Fabrication, Tromso, Norway, August, 2005

466. Invited Plenary Speaker, "Evolving Engineering Systems", Int. Conference of Systems Biology, Boston MA, October 2005

467. Invited Plenary Speaker, "Biologically Inspired Robotics", Robotics festival and exhibition, Venice, Italy, July 2005

468. Invited Speaker, DARPA/ISAT workshop "Beyond Video", Institute for Defense Analyses, Alexandria VA, June 2005

469. Invited speaker, Microsoft Faculty Summit, "3D Tablet Application", Redmond WA, June 2005

470. Invited Speaker, "Coevolutionary methods in Locomotion", Locomotion Workshop, Robotics Science and Systems, MIT, June 2005

471. Invited Speaker, "Stochastically reconfiguring systems", Modular robotics Workshop, Robotics Science and Systems, MIT, June 2005

472. Invited Colloquium Speaker, "Biology and Machines", Physics Dept, Technion – Israel Institute of Technology, December, 2004

473. Invited Lecturer, "Computational Evolution" (Three lectures series), Winter school in theoretical physics, Hebrew University of Jerusalem, December, 2004

474. Invited colloquium speaker, "Evolved Engineering Systems", Dept. of Ecology and Evolutionary Biology, Michigan State University, October, 2004

475. Invited Seminar, "Co-evolution for model inference", Seminar Series in Bioinformatics, Weisman Inst of Science, October, 2004

476. Invited Speaker, DARPA-sponsored workshop on Parallel Assembly, Lansdowne, VA, June 2004

477. Invited speaker, "Innovation in evolutionary processes", In Search of Innovation – A Complex Adaptive Systems Perspective, Stanta Fe, NM, June, 2004

478. Invited Colloquium Speaker, "Modularity, Regularity and Hierarchy in Evolved Systems", Dept. of Ecology and Evolutionary Biology, Cornell University, March 29, 2004

479. Invited speaker, Founders workshop, "Innovation in evolutionary processes", Santa Fe Institute for Complex Systems, StantaFe, NM, USA, Jan 15 2004

480. Invited plenary speaker, Meeting of the National Academies, "Modularity, Regularity and Hierarchy in Evolved Engineering Systems", Irvine, CA, USA, Nov 15 2003

481. Invited speaker, Microsoft Faculty Summit, "3D Ink", Redmond WA, June 28, 2003

482. Invited speaker, "Design Automation for Complex Systems", Advanced Systems Office of the NASA Office of Space Flight, NASA JPL, Jan 14, 2003

483. Invited speaker, Mechanical Engineering Colloquium series, California Institute of Technology, May 7, 2002

484. Invited plenary speaker, NASA Workshop on Revolutionary Aerospace Systems Concepts For Human/Robotic Exploration Of The Solar System, Hampton VA, November 2001

485. Invited speaker, Workshop on Nanophysics and Bio-Electronics, Dresden, Aug 20-24, 2001

486. Invited speaker, "Evolutionary Design", Boston University, May 2001

487. Invited speaker, "Evolutionary Design", Cornell University, May 2001

488. Invited speaker, "Evolutionary Design", University of Illinois at Urbana Champain, Apr 2001

489. Invited speaker, "Evolutionary Design", University of Washington, Apr 2001

490. Invited speaker, "Evolutionary Design", Stanford University, Apr 2001

491. Invited speaker, "Evolutionary Design", UC Berkeley, Berkeley, CA, March 2001

492. Invited speaker, "Evolutionary Design", MIT, Cambridge, MA, Feb 2001

493. Invited speaker, "Evolutionary Design", Harvard University, Cambridge, MA, Feb 2001

494. Invited speaker, "Evolutionary Design", Rice University, Austin, TX, Jan 2001

495. Invited speaker, "Evolutionary Design", Tufts University, Medford, MA, Jan 2001

496. Invited speaker, "Evolutionary Design", Northwestern University, Chicago IL, Jan 2001

497. Invited Colloquium, "Evolutionary Design", Dartmouth College - Hanover, NH, Jan 2001

498. Invited plenary speaker, ("New and Notable") Annual Biophysical Society meeting, February 20, 2001, Boston, MA, USA

499. Invited Talk, "Evolutionary Robotics", IEEE Robotics and Automation, Boston Chapter, 2001

500. Invited Speaker, International Firefighting robot competition, Trinity College, Hartford, CT, 2001

501. Plenary speaker, Volen Center for Complex Systems Annual Retreat, February 21, 2001, Woods Hole, MA, USA

502. Colloquium Speaker, "Automated Design and Fabrication of Robotic Lifeforms", Mechanical Engineering Department, Technion, Israel, Jan 2001

503. Invited talk, "Evolutionary Design", EXPO'2000 Shaping the future, Hannover, Germany, Aug 1-3, 2000

504. Plenary talk, "Automated Design Concepts, Methods, and Algorithms", CIRP Design Seminar, Haifa Israel, May 16, 2000

505. Invited talk, "High order Neurons", Workshop on Hybrid Neural Systems, NIPS 98, Brekenridge, CO, December 4-5, 1998

Professional Activities

Membership

ASME (American Association of Mechanical Engineering), Member, since 2000

IEEE (Institute of Electrical and Electronic Engineers), Member, since 1998

AAAI (American Association of Artificial Intelligence), Member, Since 2002

ACM (Association of Computing Machinery), Member, since 2005

Conference Organization

1. **General Chair**, Inside 3D printing Conference and Expo, New York NY, April 11-12, 2016 (5000 participants)

2. **General Chair**, Inside 3D printing Conference and Expo, Santa Clara, Oct 20-21, 2015 (1000 participants)

3. **General Chair**, Inside 3D printing Conference and Expo, New York NY, April 15-17, 2015 (4000 participants)

4. **General Chair**, Inside 3D printing Conference and Expo, Santa Clara CA, Oct 21-23, 2014 (Approx. 1900 participants)

5. **General Chair**, Artificial Life 2014, NYC, July 2014 (Approx. 250 participants)

6. **General Chair**, Inside 3D printing Conference and Expo, NYC, April 22-23. 2014 (Approx. 5000 participants)

7. **General Chair**, Inside 3D printing Conference and Expo, San Jose CA, Sep 17-18, 2013 (Approx. 1500 participants)

8. **General Chair**, Inside 3D printing Conference and Expo, Chicago, July 10-11, 2013 (Approx. 1000 participants)

9. **General Chair**, Inside 3D printing Conference and Expo, NYC, April 22-23. 2013 (Approx. 3000 participants)

10. **Co-organizer**, Workshop on Soft Robotics, Monte Veritas, Switzerland, July 2013 (Approx. 80 participants)

11. **Co-organizer**, Workshop on Modular Robotics, IROS, August 2008

12. **General Chair**, ACM Genetic and Evolutionary Computation Conference (GECCO) 2007, (600 participants) Largest annual conference on evolutionary computation.

13. **Co-organizer**, Workshop on Self Replication, Indiana University, June 2006

14. **Co-organizer**, Workshop on Modular Robotics, U. of Pennsylvania, June 2006

15. **Area Chair**, Robotics Science and Systems '06, U. of Pennsylvania, June 2006 (300 participants)

16. **Track Chair,** Genetic and Evolutionary Computation Conference, Seattle WA, June 2006 (expected 600 participants)

17. **Track Chair,** Genetic and Evolutionary Computation Conference, Washington DC, June 2005 (600 participants)

18. **Co-Chair,** Workshop on Modularity, Regularity and Hierarchy in Evolutionary Computation, June 2004, Seattle, WA (55 Participants).

19. **Co-Chair,** AAAI Symposium on Computational Synthesis, March 242-26, 2003, Stanford CA (60 Participants).

20. **Co-organizer**, ALife VII Workshop on Co-evolution of Bodies and Brains, Aug 3, 2000 Reed College, Portland Oregon

Reviewer, Program and Editorial Committees

1. **Editorial Board,** *Science Robotics* (**2020-**)

2. **Editor-in-Chief (2013-2015):** 3D Printing and Additive Manufacturing (3DP), Mary Ann Liebert Publishing

3. **Program Committees**: Artificial Intelligence in Design (AID), Artificial Life (ALIFE), Genetic and Evolutionary Computation (GECCO), Solid Modeling (SM), Frontiers in Evolutionary Algorithms (FEA)

4. **Reviewer**: Nature, Science, PNAS, Computer Aided Design, ASME Journal of Computing and Information Science (AJCIS), ASME Journal of Mechanical Design (AJMD), IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI), IEEE Transaction on Evolutionary

Computation, Artificial Life, Journal of Computer Integrated Manufacturing, International Journal of Computer Vision (IJCV), Computer Vision and Image Understanding (CVIU), Computer Graphics, Others…

Grants and awards

(First name listed is PI, following (if any) are Co-PIs)

1. Lipson H., Billinge S, "Deep Generative Crystallography", $160K, DSI/SIRS, 3/2023-2/2024
2. Kutz N, Brunton S, Lipson H., Na L, Manohar K, "NSF Institute for Artificial intelligence on Dynamical Systems", NSF, $20M, 1/2022-12/2027
3. Lipson H., (PI) "Modeling 3D Printed Meat surrogates", Redefine Meat Inc, $115,000, 1/2022-12/2022
4. Lipson H., (PI) "3D Food Printing", Journey Foods, $115,000, 1/2022-12/2022
5. Lipson H., (PI) "Self-Modeling Systems", DARPA, $470K, 4/2021-6/2022
6. Lipson H., (PI) "Multifunctional, Robotically Reconfigurable System for Structural Support", NASA NSTRF, $144K
7. Lipson H., (PI) " I-Corps: A hand-held device that generates 2D and 3D ultrasound sonograms", NSF I-Corps, $50K, 3/2021-9/2021
8. Lipson H. (PI) "Open Source Ultrasound – Phase II", Eric Schmidt Foundation, $350K, 6/19-6/21
9. Vondrick C, Lipson H., (co-PI) "Learning Visual Dynamics from Interaction", NSF, $750K, 10/19-9/22
10. Lipson H. (PI) "Open Source Ultrasound – Phase I", Eric Schmidt Foundation, $106K, 6/18-6/19
11. Lipson H. (PI) "Soft Actuators for Soft Robotics", IMOD, 2016-2019, $370,000
12. Lipson H., (PI) "Auto-generative Networks", DARPA, 1/2018-12/2019, $816K
13. Chattopadhyay, I (PI) , Lipson H. (co-PI), "ZeD: Zero information modeling", DARPA, 3/2017-2/2021, $400K, Lipson portion $125K
14. Lipson H. (PI), "Simultaneous Optimization and Simulation", DARPA, 1/2017-12/2020, $989K
15. Lipson H., Grinspun E "Food Printing", SEAS SIRS, 2017-2018, $160,000, Lipson Portion $80K
16. Lipson H., "Voxel Advanced Digital-manufacturing for Earth and Regolith in Space ", NASA, 4/2016-7/2016, $18K

17. Lipson H. (2016) "Self-Aware machines", Northrop Grumman Corporation 2016-2017, $85,000

18. Lipson H., Gore M., Nelson R. (2015) " Deep Learning UASs for High-Throughput Agricultural Disease Phenotyping", National Science Foundation, 5/2015-4/2018, $1.2M

19. Lipson H., (2015) "Text To Food: Exploration In 3D Food Printing", University of Chicago, 5/2014-4/2015, $10,000

20. Lipson H., Labutov I. (2014) "Automatic curriculum generation from prerequisite concept networks", Metaknowledge Network, 2014-2015, $108,882

21. Lipson H. (2013) "Simulator 3D printing electrometrical systems", IMOD, 2015-2016, $125,000

22. Lipson H. (2014) "Matter Compilers", DARPA Open Manufacturing, 2014-2015, $100,000

23. James K. Min, Lipson H., R Shepherd (2014) " Fabrication of 3D Printing Models of Patient-Specific Geometric Models of Human Coronary Arteries for Non-invasive Calculation of Coronary Artery Pressure and Flow", Cornell Medical School, 2014-2015, $47,491

24. Lipson H. (2013) "3D printing electrometrical systems", IMOD, 2013-2014, $150,000

25. Lipson H. (2012) "Inverse Gillespie Algorithm", ARO, 2012-2014, $300,000

26. Lipson H. (2012) "Matter Compilers", DARPA Open Manufacturing, 2012-2014, $400,000

27. Lipson H. (2011) "Rapid Assemblers", DARPA M3 2011-2014, $430,000

28. Bull G., French J., Berry R., Lipson H. (2010) "The FabLab classroom: Preparing Students for the Next Industrial Revolution", NSF 2010-2013, $250,000

29. Bull G., Berry R., Lipson H. (2010) "Fab@School – A Digital Fabrication Laboratory for the Classroom", Motorola Foundation Innovation Generation, $250,000, 2010-2011

30. Bull G., Berry R., Lipson H. (2010) "Fab@School – A Digital Fabrication Laboratory for the Classroom", MacArthur Reimagining Learning Competition, $185,000, 2010-2011

31. McLean J., Wkiswo J., Lipson H., (2009) "Elucidation of Leukocyte and Macrophage Biomarker Signature from Drugs of Abuse", NIH, $2,700,000, 2009-2011

32. Lipson H., Suel G., (2009) "Distilling natural laws from experimental data", NSF, $600,000, 2009-2012

33. Wikswo J., Lipson H., Jenkins J.W., (2009) "Automated Characterization of the Interaction Dynamics between Toxic Chemicals and Biological Agents", DTRA, $2,499,762, 2009-2013

34. Moon F.C, Lipson H., Sachse W., Williams C.H. Garcia E.G, Pratt K. (2008), "Vibro-Wind Technology: Alternative Wind Energy Systems for Buildings", Cornell CCSF, $100,000, 2008-2009.

35. Lipson H., Erickson D., Jaeger H., (2008), "Hierarchical programmable self-assembly", DARPA MTO, $2,500,000, 2008-2011.

36. Hornby G., Lipson H., Pollack J.B., (2008), "Co-evolution of designers and critics", NSF Creative IT, $800,000, 2008-2011.

37. Rus D., Lipson H., Yim M., Klavins E., (2007), "The reconfigurable Factory", NSF EFRI, $2,000,000, 2007-2011.

38. Bonassar L., Butcher J, Lipson H (2007) "Multidisciplinary Approach for Engineered Heart Valves Using Novel Biomaterials," Morgan Tissue Engineering, $96,000 2007-2008

39. Bonassar L, Garcia E, Lipson H (2007) "Engineering Biological Interfaces Towards Enhanced Prosthetic Integration," AFOSR, $205,469, 2006-2008

40. Lipson H. (2007) "A Modular Reconfigurable Robotic Platform for Research in Machine Resiliency and Adaptation", Microsoft Gift, $105,000 2007-2008

41. Lipson H. (2007) "A Modular Reconfigurable Platform for Robotics Education", Festo AG & Co. KG, $89,000 2007-2008

42. Lipson H. (2007) "A 1-MegaVoxel 3D Digital Printer for Multi-material Desktop Microfabrication", DARPA MTO Young Faculty Award, $150,000 2007-2008

43. Bongard J., Lipson H. (2006) "Automatic Probing and Modeling of Nonlinear Biological Networks: Toward Automated Systems Biology", Microsoft Corp., $178,000 2006-2007

44. Lipson H., Erickson D. (2006) "SGER: Hierarchical Microfabrication: Actively Programmable Multi-level Fluidic Self-Assembly", NSF, $130,000 2006-2007

45. Campbell M., Garcia E., Lipson H., Psiaki M., Huttonlocker D., Selman B. (2007) "Team Cornell: Autonomous Vehicle for Operations in Urban Environments", DARPA, 2006-2007, $1,000,000

46. Lipson H. (2006) "CAREER: Algorithms For Design Of Active Fault-Tolerant Systems", NSF, $400,000 2006-2011

47. Lipson H. (2005) "ITR: Sketching for Conceptual Visualization, Simulation, and Learning", NSF, $365,000 2005-2007

48. Valero Cuevas F.C., Lipson H. (2004) "Structure & function of the fingers' tendinous apparatus", NIH, $1,100,000 2004-2008

49. Lipson H., Hornby G. (2004) "Evolutionary algorithms for recovery of physical robot functionality in unanticipated conditions", NASA, $474,394 2004-2006

50. Lipson H., (2004) "In-Situ Self-Repair and Adaptation for Autonomous Vehicles", NASA GSRP 2-Year Graduate Research Fellowship, 2004-2005

51. Saylor J. M., Lipson H., Moon F. (2004) "A Digital Library of Printable Machines", The Institute for Museum and Library Services (IMLS), $499,710, 2004-2006

52. Lipson H., Alon U., (2004) "Computational Methods for Automatic Inference of Biological Networks", The National Academies, $75,000, 2004-2005

53. Lipson H., (2003) "Embedded Systems for Evolutionary Robotics", Microsoft unrestricted gift, $25,000, 2003-2004

54. Lipson H, Valero Cuevas F, Garcia E. (2003-2007) "Biologically Inspired Hexapod Platform With Decentralized Neurocontrol And Adaptive Morphology", $200,000, U.S. Department of Defense

55. Lipson H., (2002) "3D Digital Sketching", Microsoft unrestricted gift, $116,000, 2002-2004

56. Saylor J.M., David Henderson, Hod Lipson, Francis Moon, (2002) "Kinematic Models for Design Digital Library", National Science Foundation, $725,000 2002-2004.

57. Lipson H, (2002) "Autonomous Self-Extending Machines for Accelerating Space Exploration", NASA Institute for Advanced Concept (NIAC), $75,000, 2002-2003.

58. Lipson H., (2002) "Electronic Workflow in Engineering Synthesis Courses", Cornell CIT, $20,000 2002-2003

59. Pollack J.B., Lipson H. (2001) "Complexity in automatically designed robotics", DOE – U.S. Department of Energy, $526,000   2002-2004

60. Pollack J.B., Lipson H., (1999) "Fully automated design and construction of throwaway robots", DARPA – U.S. Defense Advanced Research Projects Administration, $952,000 1999-2002.