

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

Curriculum Vitae
(Updated April 2020)

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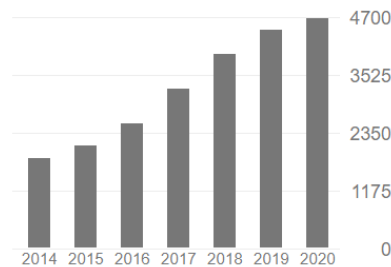
Web <https://www.hodlipson.com/>

Scholar https://scholar.google.com/citations?user=F_Go4V4AAAAJ

Key academic metrics

Citations	31,945
H-Factor	78
Publications:	329
Invited Talks	445
PhD Students	25
Years since PhD	21

Citations per year:



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	NefTrust Inc.	Co-founder, Certified Email Services (Inactive).
1994	Trilogical Inc.	Co-founder, GPS tracking (Acquired).

Editorial Positions

2020-presnt	Associate Editor, <i>Science Robotics</i> (New Journal, Impact factor TBD)
2013-2015	Founding Editor-in-Chief, <i>3D Printing and Additive Manufacturing</i> (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 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 Instructor)
1996-1997	Technion	Computer Aided Design Laboratory (Project Tutor)
1995-1997	Technion	Fluid Mechanics (Teaching Instructor)

Graduate and Postdoc Students

Current PhD Students

1. **Abigail Herschman** 2019-present, “Personal care robotics”, (Mechanical Engineering)
2. **Hayley McClintock** 2019-present, “Assembler Robots”, (Mechanical Engineering)
3. **Khawla El Hamdan** 2018-present, “Through-wall RF vision”, (Mechanical Engineering)
4. **Boxi Xia** 2018-present, “Soft Robotics”, (Mechanical Engineering)
5. **Robert Kwiatkowski** 2018-present, “Self-Modeling Systems”, (Computer Science)
6. **Boyuan Chen**- 2018-present, “Robot Theory of Mind”, (Computer Science)

7. **Jonathan Blutinger**- 2017-present, “Laser Cooking”, (Mechanical Engineering)
8. **Oscar Chang** - 2016-present, “Autogenerative networks”, (Computer Science).
9. **Yazmin Feliz** – 2015-present, “3D Ultrasound”, (Mechanical Engineering)
10. **Joni Mici**, 2015-present, “Layered Assembly”, (Mechanical Engineering).

Graduated PhD Students (Committee chair)

1. **Siyan Chen** - 2015-2019, “Data Smashing”, (Mechanical Engineering).
2. **Richa Batra** - 2014-2019, “Particle Robotics”, (Mechanical Engineering).
1. **Nick Cheney**, 2012-2017, “Automated Design of Embodied Machines”, (Comp. Biology).
2. **Igor Labutov**, 2010-2016, “Machine Teaching”, (Electrical Engineering).
3. **Jason Yosinski**, 2011-2016, “Deep learning”, (Computer Science).
4. **Jeff Lipton**, 2010-2015, 3D printing, (Field: Mechanical Engineering).
5. **Robert MacCurdy**, 2009-2015, Machine Self Reflection (Field: Mechanical Engineering).
6. **Jonas Neubert**, 2008-2014, Programmable Matter (Field: Mechanical Engineering). Currently at Zoho.com
7. **Ted Cornforth**, 2009-2014, “Reverse engineering dynamical systems”, (Field: Computational Biology)
8. **Daniel Ly**, 2009-2013, Automated Telescience (Field: Mechanical Engineering). Currently postdoc at Stanford U.
9. **John Amend**, 2008-2013, Jamming robotics: Programmable Phase Transition Materials (Field: Mechanical Engineering). Currently: Founder and CTO of Empire Robotics, Inc.
10. **Jonathan Hiller**, 2006-2011, Digital Manufacturing (Field: Mechanical Engineering). Currently Director of Engineering at Modular Robotics Inc.
11. **Michael Schmidt**, 2006-2010, Co-evolutionary System Identification (Field: Computational Biology). Currently Founder and CEO of Nutonian, Inc.
12. **Michael Tolley**, 2005-2010, Micro Self-Assembling Stochastic Robotics (Field: ME). Currently Faculty at University of California San Diego (UCSD).
13. **Daniel L. Cohen**, 2005-2010, 3D Bioprinting (Field: Mechanical Engineering). Currently Founder and CEO of 3DBio Inc.
14. **Evan Malone**, 2002-2008; Multimaterial Solid Freeform Fabrication of Active Systems (Field: MAE). Currently Founder and CEO of NextFab, Inc.
15. **Viktor Zykov**, 2003-2007, Damage Diagnosis and Repair in Robotic Systems (Field: MAE).

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. **Li Sun**, 2018-2019, Earthquake Modeling
2. **Aslan Miriyev**, 2015-2018, Soft Actuators
3. **Jun Ogawa** (2015-2016) Evolutionary Robotics
4. **Petar Curkovic**, 2014-2015, Design Automation
5. **Shuguang Li**, 2014-2015, Morphing Robotics
6. **Navneet Bhalla**, 2014-2015, Self-Assembly
7. **Ishanu Chattopadhyay**, 2011-2014, Machine Learning.
8. **Daniel Ly** 2013-present, Automated Modeling
9. **Jonathan Platkiewicz**, 2013-2014, Haptic sensing.
10. **Sebastian Risi**, 2012-2013, Neuroevolution.
11. **Ben Finio**, 2012-2013, Manufacturing Education.
12. **Jeff Clune**, 2010-2012, Evolutionary design and modularity,
13. **David Kou**, 2010, CAD/CAM.
14. **Juan Zagal**, 2008-2010, Machine Self-reflection.
15. **Eric Schweikardt**, 2008-2009, Modular Robotics..
16. **Kyung-Joong Kim**, 2006-2009, Cognitive evolutionary robotics.
17. **Nicolas Lassabe**, 2008, Modular robotics
18. **Viktor Zykov**, 2008, Damage Diagnosis and Repair in Robotic Systems
19. **John Reiffel**, 2006-2007, Tensegrity robotics.

20. **Anupam Saxena**, 2005-2007, Inference of biological networks.
21. **Sanjeev Kumar**, 2004-2006, Algorithms for Musculoskeletal inference.
22. **Mark Masry**, 2004-2005, Algorithms for 3D Sketch understanding.
23. **Chandana Paul**, 2004-2005, Tensegrity Robotics
24. **Josh Bongard**, 2003-2006, Co-evolutionary algorithms for system design and analysis.

Honors and Awards Received

- 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. Lipson, H. "Robots on the run (vol 4, eaau5872, 2019)." **Nature** 576.7787 (2019): 397-397.
2. Mici, J., Ko, J. W., West, J., Jaquith, J., & Lipson, H. (2019). Parallel electrostatic grippers for layered assembly. **Additive Manufacturing**, 27, 451-460
3. Wu, Harvey, et al. "Autonomous detection of plant disease symptoms directly from aerial imagery." **The Plant Phenome Journal** 2.1 (2019).
4. Bluting, Jonathan David, Yorán Meijers, and Hod Lipson. "Selective laser broiling of Atlantic salmon." **Food research international** 120 (2019): 196-208
5. 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
6. Kwiatkowski, R., & Lipson, H. (2019). Task-agnostic self-modeling machines. **Science Robotics.**, 4, eaau9354.
7. 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.
8. J Mici, JW Ko, J West, J Jaquith, H Lipson (2019) "Parallel Electrostatic Grippers for Layered Assembly ", **Additive Manufacturing** (in press)
9. Lipson H., (2019) "Robots On The Run", *Nature* 568, 174-175 (2019)

10. Blutinger, J. D., Meijers, Y., & Lipson, H. (2019). Selective laser broiling of Atlantic salmon. **Food Research International**, 120, 196-208.
11. 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.
12. Blutinger, J. D., Meijers, Y., Chen, P. Y., Zheng, C., Grinspun, E., & Lipson, H. (2019). Characterization of CO₂ laser browning of dough. **Innovative Food Science & Emerging Technologies**, 52, 145-157.
13. 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.
14. 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
15. 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.
16. 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.
17. 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)
18. 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.
19. A Miriyev, G Caires, H Lipson, (2018) Functional properties of silicone/ethanol soft-actuator composites, **Materials & Design** 145, 232-242
20. Cellucci, D., MacCurdy, R., Lipson, H., & Risi, S. (2017). 1D Printing of Recyclable Robots. **IEEE Robotics and Automation Letters**, 2(4), 1964-1971.
21. Miriyev, A., Stack, K., & Lipson, H. (2017). Soft material for soft actuators. **Nature communications**, 8(1), 596.
22. 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.
23. Amend J, Lipson H (2017) "The JamHand: Dexterous Manipulation with Minimal Actuation" **Soft Robotics** 4 (1), 70-80

24. Grouchy, P., D'Eleuterio, G. M., Christiansen, M. H., & Lipson, H. (2016). "On The Evolutionary Origin of Symbolic Communication". **Scientific Reports**, 6.
25. Lipton, J. I., & Lipson, H. (2016). 3D printing variable stiffness foams using viscous thread instability. **Scientific Reports**, 6.
26. Lipton JI, Angle S, Banai RE, Peretz E, Lipson H, (2016) "Electrically Actuated Hydraulic Solids", **Advanced Engineering Materials** 18 (10), 1710-1715
27. 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
28. Cheney, N., & Lipson, H. (2016). Topological evolution for embodied cellular automata. **Theoretical Computer Science**, 633, 19-27.
29. 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
30. Platkiewicz, J., Lipson, H., & Hayward, V. (2016). Haptic Edge Detection Through Shear. **Scientific reports**, 6
31. J Neubert, H Lipson Soldercubes: a self-soldering self-reconfiguring modular robot system, **Autonomous Robots** 40 (1), 139-158
32. 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.
33. 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
34. 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
35. Lipson H., (2014) "Challenges and Opportunities for Design, Simulation, and Fabrication of Soft Robots" **Soft Robotics**. March 2014, 1(1): 21-27.
36. 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
37. Hiller J, Lipson H., (2014), "Dynamic Simulation of Soft Multi-Material 3D-Printed Objects", **Soft Robotics**, Soft Robotics. March 2014, 1(1): 88-101.
38. 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
39. Chattopadhyay, I., Kuchina, A., Suel, G. and Lipson, H. (2013) "Inverse Gillespie for inferring stochastic reaction mechanisms from intermittent samples." **PNAS**, July 22, 2013.

40. Lipton, J. and Lipson, H. (2013) "Adventures in Food Printing". **IEEE Spectrum**, May 31, 2013.
41. Ly, D.L. and Lipson, H. (2013) "Optimal Experiment Design for Coevolutionary Active Learning". **IEEE Transactions on Evolutionary Computation**. (In press)
42. Clune, J., Baptiste-Mouret, J-B., Lipson, H. (2013) "The evolutionary origins of modularity". **Proceedings of the Royal Society B** 280 (1755).
43. Nigl, F., Li, S., Blum, J. E., Lipson, H. (2013) "Autonomous Truss Reconfiguration and Manipulation", **IEEE Robotics and Automation Magazine**, accepted for publication
44. Chattopadhyay I. and Lipson H. (2013) "Abductive learning of quantized stochastic processes with probabilistic finite automata", **Phil Trans R Soc A**, 371: 20110543.
45. 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 *
46. Lipson H. (2012) "Thinking outside the CAD box: design in the age of 3-D printing", **Mechanical Engineering**, Oct 2012
47. Ly, D.L. and Lipson, H. (2012) "Learning Symbolic Representations of Hybrid Dynamical Systems", **Journal of Machine Learning Research**, Vol. 13, pp.3585-3618.
48. Hiller, J. and Lipson, H. (2012) "Automatic Design and Manufacture of Soft Robots" **IEEE Transactions on Robotics**, Vol. 28, No. 2, pp. 457-466.
49. 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.
50. 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.
51. 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.
52. 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).

53. 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.
54. 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.
55. Lipson, H. (2012) "Frontiers in Additive Manufacturing", **The Bridge (National Academies)**, Vol. 42, No. 1, Spring 2012, pp. 5-12.
56. Schmidt, M. D., Vallabhajosyula, R. R., Jenkins, J. W., Hood, J. E., Soni, A. S., Wikswa, J. P., et al. (2011). "Automated refinement and inference of analytical models for metabolic networks", **Physical Biology**, 8(5).
57. 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.
58. Lipson, H. (2011) "Self-Reflective Architecture", **Cornell Journal of Architecture**, Vol. 8, pp. 16-23.
59. Tolley, M. and Lipson, H. (2011) "On-line assembly planning for stochastically reconfigurable systems", **International Journal of Robotics Research**, Vol. 30 (11).
60. 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.
61. 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.
62. 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.
63. Li, S., Yuan, J., and Lipson, H. (2011) "Ambient wind energy harvesting using cross-flow fluttering", **Journal of Applied Physics**, 109, 026104.
64. 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.
65. 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.
66. 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.
67. 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.
 68. 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.
 69. 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.
 70. Hiller, J. and Lipson, H. (2010) “Tunable digital material properties for 3D voxel printers”, **Rapid Prototyping Journal**, Vol. 16, No. 4, pp. 241-247.
 71. Cohen, D. and Lipson, H. (2010) “Geometric feedback control of discrete-deposition SFF systems”, **Rapid Prototyping Journal**, Vol. 16, No. 5, pp. 377-393.
 72. 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*.
 73. 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.
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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, Soft Robotics 2020, “Soft Actuators for Soft Robotics”, Haifa Israel, Feb 5, 2020
2. Keynote, A360, “Autonomous Vehicles”, Los Angeles, CA, Jan 20, 2020
3. Invited Speaker, CVC Annual Retreat, “Trends in Robotics and AI”, Palm Beach FL, Jan 9, 2020
4. Keynote, Edge Connex Annual Retreat, “Trends in Artificial Intelligence”, Washington DC, Dec 12, 2019
5. Invited Speaker, Envision 2020, “AI Ethics”, Princeton NJ, Nov 22, 2019

6. Invited Speaker, Citibank Singapore, “Trends in Robotics and AI”, Singapore, Nov 14, 2019
7. Keynote, 3D Printing and Beyond, “The four waves of Additive Manufacturing”, Jerusalem Israel, Nov 7, 2019
8. Invited Speaker, Citibank Singapore, “Trends in Robotics and AI”, Singapore, Nov 3, 2019
9. Keynote, WE Summit, “Self Aware Machines”, Beijing, Nov 2, 2019
10. Keynote, Columbia Dental School, “Artificial Intelligence in Dentistry”, New York NY, Sep 29, 2019
11. Invited Speaker, Citibank, “Trends in Robotics and AI”, Santa Clara CA, Oct 22, 2019
12. Invited Speaker, Citibank Singapore, “Trends in Robotics and AI”, Singapore, Sep 25, 2019
13. Keynote, Teacher’s College, “AI in Education”, New York NY, Sep 20, 2019
14. Keynote, Goldman Sachs investor retreat, “Trends in Artificial Intelligence”, New York NY, Sep 19, 2019
15. Keynote, AkzoNobel Annual Summit, “Autonomous Vehicles”, New Orleans, LA, Sep 18, 2019
16. Invited Speaker, LG, “Trends in 5G”, Santa Clara CA, Sep 17, 2019
17. Invited Speaker, YPO Long Island, “Trends in Artificial Intelligence”, Long Island NY, Sep 13, 2019
18. Keynote, Goldman Sachs investor retreat, “Trends in Artificial Intelligence”, New York NY, Sep 12, 2019
19. Invited Speaker, Moody, “Trends in Artificial Intelligence”, New York NY, Sep 10, 2019
20. Invited Speaker, Citibank Singapore, “Trends in Robotics and AI”, Singapore, Aug 26, 2019
21. Keynote, Epigenetic Robotics, EPIROB 2019, “Cognitive Robotics”, Oslo, Norway, Aug 20, 2019
22. Invited Speaker, Exxon Mobil, “Trends in Robotics and AI”, Luanda, Angola, Aug 16, 2019
23. Keynote, tech HR, “Artificial Intelligence”, Delhi, Aug 1, 2019
24. Invited Speaker, US DDI, “Trends in Robotics and AI”, Washington DC, July 30, 2019
25. Invited Speaker, DDI, “Trends in Robotics and AI”, Washington DC, July 30, 2019
26. Keynote, SAP Summit, “Artificial Intelligence”, Philadelphia PA, July 24, 2019
27. Invited Speaker, Singularity University EIP, “Trends in Robotics and AI”, Mountain View CA, July 22, 2019
28. Keynote, CARSTAR Annual Summit, “Autonomous Vehicles”, Chicago IL, July 10, 2019
29. Keynote, BBVA Annual Retreat, “Machine Learning and Big Data”, Madrid, Spain, June 26, 2019

30. Keynote, Cargill Annual Retreat, “Machine Learning and Big Data”, Wichita KS, June 24, 2019
31. Invited Speaker, Italy Singularity Summit, “Machine Learning and Big Data”, Rome, Italy, June 18, 2019
32. Keynote, IBIS Automotive Summit, “Artificial Intelligence and the automotive industry”, Milan Italy, June 10, 2019
33. Invited Speaker, BWI GmbH, “Machine Learning and Big Data”, Berlin Germany, June 4, 2019
34. Invited Speaker, Singularity University EIP, “Trends in Robotics and AI”, Mountain View CA, May 20, 2019
35. Keynote, World Retail; Congress, “The Six Waves of AI”, Amsterdam, Netherlands, May 15, 2019
36. Keynote, Canadian Assoc of Pharmacy, “The Six Waves of AI”, Carlsbad, CA, May 7, 2019
37. Invited Speaker, Singularity University WE Family Event, “Trends in Robotics and AI”, Mountain View CA, May 4, 2019
38. Invited Speaker, COBPEA, “Trends in Robotics and AI”, Mountain View CA, April 29, 2019
39. Keynote, EO Global Leaders’ Summit GLC, “The Six Waves of AI”, Maccau, China, April 14, 2019
40. Invited Speaker, Booz Allen, “Trends in Robotics and AI”, Washington DC, March 26, 2019
41. Invited Speaker, Temaseak, “Smart Cities”, Singapore, March 20, 2019
42. Invited Speaker, Citibank Wealth Management, “Trends in Robotics and AI”, Mountain View CA, March 13, 2019
43. Keynote, Lockheed Martin Retreat, “Trends in Robotics and AI”, Dallas/Fort Worth, TX, March 6, 2019
44. Invited Speaker, Finish Posti, “Machine Learning and Big Data”, Helsinki Finland, Feb 28, 2019
45. Keynote, AAWC, “AI in retail”, The World Congress of the International Advertising Association, Kochi, India, Feb 22, 2019
46. Colloquium, Duke University Pearsall Lecture, “Automating Discovery”, Durham NC, Feb 13, 2019
47. Invited Speaker, Elixir Group, “Machine Learning and Big Data”, Mountain View CA, Feb 6, 2019
48. Invited Speaker, DoD, “Machine Learning and Big Data”, Mountain View CA, Jan 29, 2019
49. Keynote, Verifacts, “Driverless Cars and the Road ahead”, Toronto Canada, Jan 23, 2019

50. Colloquium, Washington University, “Automating Discovery”, Seattle WA, Jan 17, 2019
51. Invited Speaker, Quantonomics / Goldman Sachs, “The Six Waves of Artificial Intelligence”, New York NY, Jan 10, 2019
52. Invited Speaker, YPO Gold , “The Six Waves of Artificial Intelligence”, Zurich Switzerland, Dec 13, 2018
53. Invited Speaker, Schindler Exec Retreat, “The Six Waves of Artificial Intelligence”, Lucerne Switzerland, Dec 12, 2018
54. Invited Speaker, Cargill, “Machine Learning and Big Data”, Mountain View CA, Nov 9, 2018
55. Keynote, the Growth Faculty, “The Six Waves of Artificial Intelligence”, Sydney Australia, Nov 15, 2018
56. Invited Speaker, Pactual Asset Management, “Machine Learning and Big Data”, Mountain View CA, Nov 9, 2018
57. Keynote, Mexico Singularity Summit, “Machine Creativity”, Puerto Valencia, Mexico, Nov 7, 2018
58. Invited Speaker, The Entrepreneur Network, “Machine Learning and Big Data”, Mountain View CA, Nov 6, 2018
59. Colloquium, University of Connecticut, “Automating Discovery”, UConn, Nov 5, 2018
60. Invited Speaker, Citibank 10x Strategy, “Artificial Intelligence in Finance”, New York NY, Nov 1, 2018
61. Keynote, Entrepreneur Organization, “Machine Creativity”, San Francisco CA, Oct 18, 2018
62. Keynote, Altair Summit, “Machine Creativity”, Paris, France, Oct 17, 2018
63. Keynote, Deloitte Mexico, “AI in retail”, Mexico City, Mexico, Oct 10, 2018
64. Invited Speaker, Jacksonville Energy Authority, “Machine Learning and Big Data”, Jacksonville FL, Oct 5, 2018
65. Invited Speaker, Equity Residential, “Machine Learning and Big Data”, Mountain View CA, Oct 3, 2018
66. Keynote, Italy Summit, “Machine Creativity”, Milan, Italy, Oct 2, 2018
67. Keynote, Agora Summit, “The Six Waves of Artificial Intelligence”, Tucson Arizona, Sep 28, 2018
68. Invited Speaker, Exxon Mobil, “Machine Learning and AI”, Houston TX, Sep 27, 2018
69. Invited Speaker, Raymond India, “Big Data”, Mumbai India, Sep 26, 2018
70. Keynote, Deloitte Ireland, “The Six Waves of Artificial Intelligence”, Dublin, Ireland, Sep 11, 2018
71. Invited Speaker, UPM, “Big Data”, Mountain View CA, Aug 27, 2018

72. Keynote, Asia Pacific Global Impact Challenge, “The Six Waves of AI”, Taiwan, Aug 10, 2018
73. Invited Speaker, A360, “Trends in Machine Learning and AI”, Mountain View CA, July 30, 2018
74. Invited Speaker, Singularity University, Executive Program, “Trends in Robotics and AI”, Mountain View CA, July 22, 2018
75. Invited Speaker, CASVI, “Trends in Machine Learning and AI”, Mountain View CA, July 18, 2018
76. Keynote, FAB14, “Food Printing”, Toulouse, France, July 16, 2018
77. Invited Speaker, Google/Australia, “Trends in Machine Learning and AI”, Mountain View CA, July 12, 2018
78. Invited Speaker, Singularity University, Exponential Innovation Program, “Trends in Robotics and AI”, Mountain View CA, July 9, 2018
79. Invited Speaker, LG Academy, “5G”, Mountain View CA, June 11, 2018
80. Keynote, Positive Impact, “The Six Waves of Artificial Intelligence”, Milan, Italy, June 20, 2018
81. Keynote, Accenture, “The Six Waves of Artificial Intelligence”, Frankfurt Germany , June 13, 2018
82. Invited Speaker, Peoplefund, “Trends in Machine Learning and AI”, Mountain View CA, June 11, 2018
83. Invited Speaker, Google/Singapore, “Machine Learning and AI”, Mountain View CA, June 7, 2018
84. Invited Speaker, Exxon Mobil, “Machine Learning and Digital Twins”, Houston TX, June 6, 2018
85. Keynote, STEP Miami, “Artificial Intelligence”, Miami FL, May 31, 2018
86. Guest Speaker, Unilever, “The Six Waves of Artificial Intelligence”, Palo Alto CA, May 29, 2018
87. Keynote, 21 Foundation, “Artificial Intelligence and Robotics”, Tokyo Japan, May 24, 2018
88. Invited Speaker, Barclays Bank, “The Six Waves of Artificial Intelligence”, London UK, May 18, 2018
89. Keynote, Inter-American Development Bank (IDB), “Autonomous Vehicles and the road ahead”, Washington DC, May 17, 2018
90. Keynote, Young Professional Organization (YPO), Dallas Chapter, “Artificial Intelligence”, Dallas, TX, May 10, 2018

91. Guest Speaker, Singularity Executive training program, “Artificial Intelligence and Robotics”, Moffet Field CA, May 6, 2018
92. Keynote, Executive Program Toronto, “AI and Robotics”, Toronto ON, May 1, 2018
93. Keynote, Young Professional Organization (YPO) of Switzerland, “Artificial Intelligence”, Geneva, Switzerland, April 26, 2018
94. Guest Speaker, Legal & General Investment Management America, Inc. (LGIMA), “Trends in Data Science”, Chicago IL, April 17, 2018
95. Guest Speaker, Singularity Executive training program, “Artificial Intelligence and Robotics”, Moffet Field CA, March 25, 2018
96. Guest Speaker, Grupo Salinas Executive retreat, “Artificial Intelligence”, Mexico City, Mexico, March 22, 2018
97. Keynote, Singularity University Czech Summit, “Curious and Creative Machines”, Prague, Czech Republic, March 6, 2018
98. Keynote, Latham & Watkins Annual Summit, “Trends in Artificial Intelligence”, New York NY, March 2, 2018
99. Invited Talk, Grupo Bal Retreat, “Trends in Artificial Intelligence and Robotics”, San Francisco CA, Feb 28, 2018
100. Guest Speaker, Citibank Private Bank, “Artificial Intelligence”, Mexico City, Mexico, Feb 22, 2018
101. Colloquium, Iowa State University Food Science Department, “Food Printing”, Des Moines IA, Feb 14, 2018
102. Invited Talk, Exxon Mobile Executive training, “Trends in Artificial Intelligence and Robotics”, Houston TX, Feb 20, 2018
103. Colloquium, Columbia University Astrophysics Department annual Radical Hypothesis Lecture, “Robot Scientists”, New York NY, Feb 14, 2018
104. Invited Talk, Google/Scandinavia “The four exponentials of Artificial Intelligence”, Mountain View CA, Feb 13, 2018
105. Keynote, Syracuse Research Corporation (SRC) “The six waves of Artificial Intelligence”, Syracuse NY, Feb 9, 2018
106. Keynote, Barclays Bank Summit, “The Compounding Exponentials of AI”, London, UK, Feb 8, 2018
107. Guest Speaker, The Executive Network (TEN), “Artificial Intelligence and Robotics”, Mountain View CA, Feb 6, 2018

108. Guest Speaker, Singularity Executive training program, “Artificial Intelligence and Robotics”, Moffet Field CA, Jan 30, 2018
109. Guest Speaker, Citibank Private Bank, “Artificial Intelligence”, New York NY, Jan 24, 2018
110. Invited Talk, Singularity University Summit, “Artificial Intelligence”, Brussels, Belgium, Jan 23, 2018
111. Keynote, Deloitte Future of Retail Summit, “AI and retail”, New York NY, Jan 16, 2018
112. Invited Talk, SEAS Alumni Event, “the Six Waves of Artificial Intelligence”, New York NY, Jan 16, 2018
113. Invited Talk, Jardine Matheson, “Artificial Intelligence and Robotics”, Mountain View, CA, Jan 10, 2018
114. Keynote, Stuyvesant High School Annual Splash, “Artificial Intelligence and Robotics”, New York NY, Dec 16, 2017
115. Invited Talk, Deloitte Partner meeting “Artificial Intelligence and Robotics”, Dallas, TX, Dec 7, 2017
116. Invited Talk, Raizen “Trends in Artificial Intelligence and Robotics”, Mountain View, CA, Nov 16, 2017
117. Keynote, NY Annual conference on Manufacturing an Innovation, NEXT 17, “The six waves of Artificial Intelligence”, Syracuse NY, Nov 17, 2017
118. Invited Talk, Citibank Financial, “Trends in Artificial Intelligence and Fintech”, Mountain View, CA, Nov 16, 2017
119. Keynote, Tencent Annual Summit, “AI, Creativity, and Free Will”, Chengdu, China, Nov 8, 2017
120. Invited Talk, Bridge 37, “Trends in Artificial Intelligence and Robotics”, Mountain View, CA, Nov 1, 2017
121. Keynote, Citibank private bank summit, “Trends in Artificial Intelligence and Robotics”, Shanghai, China, Oct 19, 2017
122. Invited Talk World Knowledge Fair (WKF 2017), “How 3D Printing will change our Future”, Seoul, Korea, Oct 18, 2017
123. Invited Talk World Knowledge Fair (WKF 2017), “The Fourth Industrial Revolution and the future of Manufacturing”, Seoul, Korea, Oct 17, 2017
124. Keynote, AI and Society, “The Six Waves of Artificial Intelligence”, Tokyo, Japan, Oct 10, 2017
125. Invited Talk, Exxon Mobile Executive training, “Trends in Artificial Intelligence and Robotics”, Houston TX, Oct 3, 2017

126. Invited Talk, “Stanley Black & Decker, The four exponentials of Artificial Intelligence”, Mountain View CA, Sep 28, 2017
127. Keynote, PricewaterhouseCoopers (PWC) partner annual summit, “Trends in Artificial Intelligence”, Banff, Canada, Sep 27, 2017
128. Invited Talk, Banco Bilbao Vizcaya Argentaria, BBVA “Artificial Intelligence in fintech”, , Mountain View CA, Sep 20, 2017
129. Invited Presentation, Worlds Fair Nano Main Stage: “The Future of Robots”, Brooklyn NY, Sep 16, 2017
130. Keynote, Canadian Autobody Conference, “Will driverless cars need collision repair?”, St John’s, Newfoundland, Canada, Sep 15, 2017
131. Keynote, Altair User Summit, “Curious and Creative Machines”, Los Angeles CA, Sep 13, 2017
132. Keynote, Bosch Future of Urban Mobility, “The future of Mobility”, London UK, Sep 8, 2017
133. Invited Talk, Google Norway, “The four exponentials of Artificial Intelligence”, Mountain View CA, Aug 30, 2017
134. Invited Talk, “Trends in Artificial Intelligence”, NEC AgTech, Mountain View CA, Aug 29, 2017
135. Invited Talk, “Trends in Artificial Intelligence”, Inter-American Development Bank, Mountain View CA, Aug 25, 2017
136. Invited Talk, “The future of Mobility”, NBC, Rosewood Sand Hill, CA, Aug 24, 2017
137. Invited Talk, “Driverless cars and the road ahead”, Bosch China, Shanghai China, Aug 7, 2017
138. Keynote, “Curious and Creative Machines”, GEEK PARK Rebuild 2017 Summit, Beijing China, Aug 5, 2017
139. Invited Talk, “Driverless cars and the road ahead”, GEEK PARK Rebuild 2017 Summit, Beijing China, Aug 5, 2017
140. Invited Talk, “Artificial Intelligence in retail”, AB InBev, New York NY, Aug 1, 2017
141. Keynote, ACM/Eurographics Symposium on Computer Animation (SCA) ‘17, “Self Simulating Systems”, Los Angeles, CA, July 28, 2017
142. Keynote, Genetic and Evolutionary Computation Conference, “Adversarial Coevolution”, Berlin, Germany, July 19, 2017
143. Invited Talk, “This Six Waves of AI”, Comfama, Moffet Field CA, June 22, 2017
144. Invited Talk, “This Six Waves of AI”, Oracle, Mountain View CA, June 20, 2017

145. Invited Talk, “Trends in Artificial Intelligence and Robotics”, Vix, Key Largo, FL, June 13, 2017
146. Invited Talk, “Trends in Artificial Intelligence and Robotics”, Googleplex, Mountain View CA, June 12, 2017
147. Keynote, GE Global Research, “Trends in Additive Manufacturing”, Niskayuna, NY, June 6 2017
148. Keynote, Earnest Young Compliance & Technology Forum, “Robotics, cognitive computing and machine learning — the fad or the future?”, New York NY, May 17, 2017
149. Invited Talk, Dyson, “Trends in Artificial Intelligence”, Palo Alto, CA, May 16, 2017
150. Invited Presentation, Guild 21, “Autonomous Vehicles: Will we need body shops?”, (online), May 11, 2017
151. Invited Talk, Thales, “Trends in Artificial Intelligence”, Palo Alto, CA, May 4, 2017
152. Keynote, Deming Forum, “The Six Waves of Artificial Intelligence”, Columbia Business School, New York NY, May 2, 2017
153. Invited Talk, Inter Dev Bank (IDB), “Trends in Artificial Intelligence”, Boston MA, April 22, 2017
154. Keynote, Automotive Dealer Council Meeting, “Driverless Cars and the road ahead”, Miami FL, April 21, 2017
155. Invited Talk, Singularity University IPP, “Convergence: Driverless Cars and AI”, San Francisco, CA March 30, 2017
156. Keynote, The Rubin Museum of Art, “AIs and Avatars”, New York, NY, March 29, 2017
157. Invited Talk, Singularity University Executive Program, “Driverless Cars and the future of the city”, Palo Alto, CA March 23, 2017
158. Invited Talk, Singularity University Executive Program, “Digital Manufacturing”, Palo Alto, CA March 21, 2017
159. Invited Talk, APS meeting, “The Robotic Scientist”, New Orleans LA, March 17, 2017
160. Keynote, Tate & Lyle Texturant, “Print and Eat – The story behind food printing”, Chicago IL, March 8, 2017
161. Invited Talk, Deutsche Telekom, “Artificial Intelligence”, Bonn, Germany, March 3, 2017
162. Keynote, Cultiv8, “Print and Eat – The story behind food printing”, Monterey, CA, March 1, 2017
163. Invited Talk, Next Era, “Trends in Artificial Intelligence”, Palm Beach FL, Feb 2, 2017
164. Invited Talk, Steelcase, “Trends in Artificial Intelligence”, Palo Alto CA, Jan 18, 2017

165. Keynote, Deloitte Executive Training, “The compounding exponentials of Artificial Intelligence”, New York NY, Jan 17, 2017
166. Keynote, Inside 3D Printing, “Additive Manufacturing – The next 25 years”, San Diego, CA, Dec 14, 2016
167. Keynote, Turkey Innovation Week, “The compounding exponentials of Artificial Intelligence”, Istanbul, Turkey, Dec 10, 2016
168. Keynote, Credit Swiss Bank, “The compounding exponentials of Artificial Intelligence”, Zurich, Switzerland, Dec 5, 2016
169. Colloquium, “Driverless cars and the road ahead”, Villanova University, Villanova, PA, Dec 2, 2016
170. Keynote, Israel Aerospace Industries, “Additive Manufacturing – The next 25 years”, Tel Aviv, Israel, Nov 24, 2016
171. Keynote, ASME ICME, “Automating Discovery in Mechanical Engineering”, Haifa, Israel, Nov 21, 2016
172. Keynote, CTO Forum Rethink Disruption, “The compounding exponentials of Artificial Intelligence”, Half Moon Bay, CA, Nov 4, 2016
173. Invited panelist, Citibank autumn dialogs, “Artificial Intelligence”, San Francisco CA, Nov 2, 2016
174. Invited Briefing, Deutsche Telekom Board of directors, “Robotics and AI”, (via skype) Oct 28, 2016
175. Keynote, Holmes Global PR Summit, “The compounding exponentials of Artificial Intelligence”, Miami, FL, Oct 26, 2016
176. Invited Talk, Leadership organization of chief executives (YPO), “Exponential Trends in Robotics”, Palo Alto, CA, Oct 24, 2016
177. Invited Presentation, The Rubin Museum of Art, “Chasing Consciousness”, New York, NY, Oct 21, 2016
178. Invited Talk, Global Commercial Real Estate Association (SIOR), “Driverless cars and real estate”, New York, NY, Oct 21, 2016
179. Colloquium, Purdue University, Mechanical Engineering, “Automating Discovery”, West Lafayette, IN, October 20, 2016
180. Keynote, Kroger Inc. Strategic retreat, “Trends in Artificial Intelligence”, Cincinnati OH, October 5, 2016
181. Keynote, Eli Lilly Strategic retreat, “Trends in Artificial Intelligence”, Mexico City, Mexico, September 28, 2016

182. Colloquium, NYU Tandon School of Engineering, “Automating Discovery”, Brooklyn NY, September 27, 2016
183. Keynote, Harman International Strategic Management, “Robotics and Artificial Intelligence”, Montreal, Canada, September 20, 2016
184. Invited Talk, Singularity Summit, “Robotics and Artificial Intelligence”, Amsterdam, Netherlands, September 12, 2016
185. Invited Talk, RWE, “Robotics and Artificial Intelligence”, Essen, Germany, August 22, 2016
186. Invited Talk, Weber Shandwick, “Trends in AI”, New York NY, August 2, 2016
187. Invited Talk, Google NY, “Automatic Scientific Discovery”, New York NY, August 1 2016
188. Panel, Northeast ME Chairs meeting, “Makerspaces in ME Education”, University of Pennsylvania Mechanical Engineering Dept., Philadelphia, PA, July 29, 2016
189. Invited Talk, “Exponential trends in Robotics”, Hershey, PA, June 28 2016
190. Invited Talk, “Exponential trends in Artificial Intelligence”, AXA, New York NY, June 14 2016
191. Invited Talk, “Can a robot turn a canvas into a masterpiece?”, Google Conference on Computer Generated Art, San Francisco CA, June 1, 2016
192. Invited Talk, “Trends in Additive Manufacturing”, US Air Force Research Lab (AFRL), Dayton OH, May 26 2016
193. Panel, “Self-awareness”, NY Academy of Sciences, New York NY May 23, 2016
194. Colloquium, “Trends in Additive Manufacturing”, ETH Zurich, Zurich Switzerland, May 17, 2016
195. Keynote, “Robotics in Manufacturing”, Singularity University Exponential Manufacturing, Boston MA, May 10, 2016
196. Colloquium, “Automating Discovery: The robot Scientist”, Stanford University Biomedical Engineering Department, Palo Alto CA, May 9, 2016
197. Colloquium, “Automating Discovery: The robot Scientist”, TCNJ, College of Engineering, April 20, 2016
198. Plenary, “Can a robot turn a canvas into a masterpiece?”, MIT Conference on Computational Fabrication, Boston MA, April 19, 2016
199. Invited Talk, “Robotics and AI”, NexGen, Hong Kong, China April 13, 2016
200. Keynote, “Trends in 3D Printing”, Stratasys event, Denver CO, April 1, 2016
201. Invited Talk, “Trends in Robotics”, Dutch Royal Airforce retreat, Rotterdam Netherlands, March 31, 2016

202. Colloquium, "Automating Discovery: The robot Scientist", University of Texas Southwestern Medical Center, Dallas TX, March 18, 2016
203. Invited Talk, "Exponential Trends in AI", Procter & Gamble, Cincinnati OH, March 2, 2016
204. Invited Talk, "Exponential Trends in Robotics", Walmart Corp, March 1, 2016
205. Keynote, "Trends in Artificial Intelligence", Tec De Monterrey, Mexico City, Mexico, December 3, 2015
206. Invited Talk, "Exponential Trends in Robotics", Singularity University, Johannesburg, South Africa, Nov 17, 2015
207. Plenary, "Creative Machines", MIT Technology Review Annual Conference, Boston MA, November 3, 2015
208. Keynote, "Food Printing", Food Vision USA, Chicago IL, October 29, 2015
209. Invited Talk, "The future of 3D Printing", Makerbot Industries, Brooklyn NY, Oct 27, 2015
210. Invited Talk, "Robotics and AI", Singularity University, Moffet Field CA, Oct 19, 2015
211. Colloquium, "Automating Discovery", University of Rochester, Computer Science Department, Rochester NY, October 14, 2015
212. Keynote, "Additive Manufacturing for Long Term Care", OnLok Sustainable Long Term Care Conference, UCSF, October 8, 2015
213. Invited Seminar, "AI And Robotics", Naspers Media Retreat, San Francisco, CA, September 3, 2015
214. Keynote, "3D Printing - The next 25 Years", Stratasys User Forum, Seoul, Korea, Aug 28, 2015
215. Keynote, "3D Printing - The next 25 Years", Stratasys User Forum, Tokyo Japan, Aug 27, 2015
216. Keynote, "3D Printing - The next 25 Years", Stratasys User Forum, Shanghai China, Aug 25, 2015
217. Invited Talk, "3D Printing - The next 25 Years", USG/CENTRA, Washington DC, Aug 19, 2015
218. Keynote, "3D Printing - The next 25 Years", ASME AM3D, Boston MA, Aug 3, 2015
219. Invited Talk, "Print and Eat - Challenges and Opportunities in Food Printing", Florida Academy of Nutrition and Dietetics, Orlando FL, July 15, 2015
220. Keynote, "3D Printing - The next 25 Years", Select Bio, Boston MA, June 8, 2015
221. Keynote, "3D Printing - The next 25 Years", Potter County School District, June 17, 2015
222. Keynote, "3D Printing - The next 25 Years", Nikkei Global ICT Summit, Tokyo Japan, June 9, 2015

223. Invited Talk, “Self-Aware Systems”, Northrop Grumman, Los Angeles, June 3, 2015
224. Invited Talk, “The Future of Robotics and AI”, Barclays Bank retreat, Johannesburg, May 27, 2015
225. Keynote Speaker, “Automated Modeling of Dynamical Systems”, SIAM Conference on Applications of Dynamical Systems, Snowbird, UT, May 21, 2015
226. Invited Talk, “The Future of Robotics and AI”, Caterpillar Retreat, Peoria IL, May 20, 2015
227. Keynote, “3D Printing - The next 25 Years”, BBC Executive Forum, New York, NY May 7, 2015
228. Invited Talk, “Print and Eat - Challenges and Opportunities in Food Printing”, General Mills Inc., Minneapolis, MN, May 5, 2015
229. Keynote, “3D Printing- The next 25 Years”, Materialise Annual User Forum, Brussels, Belgium, April 23, 2015
230. Keynote, “3D Printing- The next 25 Years”, Shenzhen Innovation Fair, Shenzhen, China, April 19, 2015
231. Invited Talk, “3D Printing- The next 25 Years”, The DOW Chemical Company, Houston Tx., April 7, 2015
232. Colloquium Speaker, “Sentient Robotics”, Georgia Tech Robotics Institute, Atlanta GA, March 4, 2015
233. Keynote Speaker, “The Next 25 Years of 3D Printing”, Tissue Engineering & Bioprinting: Research to Commercialization Conference, Boston, MA, Feb 9-10, 2015,
234. Colloquium Speaker, “The Next 25 Years of 3D Printing”, Clarkson University, Mechanical Engineering Dept, Potsdam NY, Feb 6, 2015
235. Invited Speaker, “Sentient Robotics”, Baidu BIG Talk, San Francisco CA, Jan 30, 2015
236. Keynote Speaker, “3D printing materials”, Welding, Joining and Additive Manufacturing International Conference (WJAM), Tel Aviv, Israel, January 18-20, 2015
237. Invited Speaker, “Print and Eat: The future of Food printing”, Food Systems Global Summit, Cornell University, Dec 8, 2014
238. Invited Speaker, “The Future of 3D Printing”, 3M, St. Paul MN, Nov 7 2014
239. Keynote Speaker, “3D printing materials”, New Horizons in 3D Printing and Digital and Additive Manufacturing, Stony Brook, Long Island, NY, Sep 30, 2014
240. Invited Speaker “The Robot Scientist”, Annual meeting of the NAE, Mechanical Engineering Section, Washington DC, September 29, 2014
241. Colloquium Speaker, “Automated discovery”, Princeton University ME Dept, Princeton NJ, Sep 19, 2014

242. Keynote Speaker, “The Future of 3D Printing”, DoD workshop on Multifunctional Materials, Arlington VA, Aug 18, 2014
243. Keynote Speaker, “The next 225 Years of 3D Printing”, Solid Freeform fabrication (SFF) 14, Austin TX, Aug 5, 2014
244. Invited Plenary Speaker, “The Robotic Scientist”, Unconventional Computation & Natural Computation (UCNC) 2014, London ON, Canada, July 15, 2014
245. Invited Speaker, “3D printing materials”, Wyss Symposium: Adaptive Bioinspired Materials, Boston MA, June 27, 2014
246. Plenary Beacon Lecturer, “Food Printing”, Institute of Food Technologists (IFT) Annual Meeting, New Orleans, LA June 23, 2014
247. Invited speaker, “Printing electronics”, Futurapolis, May 17, Toulouse France
248. Invited Speaker, “The Future of 3D Printing”, Science and Engineering Festival, Washington DC, April 24, 2014
249. Invited Speaker, “3D Printing: The promise and Peril”, James Madison University, Harrisonburg VA, April 24, 2014
250. Invited Speaker, “3D printing in Nanotechnology”, Nano 2014, Tel Aviv, Israel, March 25, 2014
251. Colloquium Speaker, “Food printing”, Hebrew University, Food Science Dept, Israel, March 23, 2014
252. Keynote Speaker, “The future of 3D printing in Education”, Society for Information Technology and Teacher Education (SITE), Jacksonville, FL March 18, 2014
253. Annual Winegard Visiting Lecturer, “The future of 3D printing: Principles and technologies”, University of Guelph, March 13, 2014, Guelph ON, Canada
254. Invited Speaker, “Additive Manufacturing as a Transformative Manufacturing Technology”, 2014 AAAS Annual Meeting, Chicago IL, Feb 13-17, 2014
255. Colloquium Speaker, “Additive Manufacturing as a Transformative Manufacturing Technology”, Carnegie Mellon University Robotics Institute, Pittsburg PA, Nov 22, 2013
256. Congress Wide Plenary, “The future of 3D printing”, ASME 2013 Mechanical Engineering Congress & Exposition, San Diego, California, November 15-21, 2013
257. 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.
258. Keynote, “The future of 3D printing: Principles and technologies”, Juniata College, Nov 6, 2013, Huntingdon, PA

259. Invited Speaker, “The future of 3D printing: Principles and technologies”, BP Headquarters, Oct 30, 2013, Houston TX
260. 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
261. 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
262. Keynote Speaker, “The future of 3D printing: The promise and peril of a machine that can make (almost) anything”, Toulouse, France, Oct 12, 2013
263. Invited Speaker, “Automating Scientific Discovery: Distilling Natural Laws from Experimental Data, from Robotics to Material Science”, AIRBUS, Toulouse, France, Oct 11, 2013
264. Colloquium speaker, “The future of 3D Printing”, Columbia School of Architecture and Design, September 27, 2013.
265. Colloquium speaker, “Automating Discovery”, Columbia Mechanical Engineering Department, September 27, 2013.
266. Keynote, “The future of 3D printing”, Maker Faire, Toronto ON, Canada, Sep 21, 2013
267. Colloquium, “The future of 3D Printing”, Mechanical Engineering Department, Northwestern Polytechnical University, Xi’an, China, June 28, 2013
268. 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
269. Invited Speaker, “The future of 3D Printing”, American Chamber of Commerce-China, Beijing, June 25, 2013
270. Keynote Speaker, “Digital Fashion”, 1st International Conference on Digital Fashion, London College of Fashion, London, UK, May 16 – 17, 2013.
271. Invited Speaker, National Academy of Sciences’ Committee on Science, Technology, and Law (CSTL), Washington, DC, May 13, 2013.
272. Invited Colloquium, “Scientific Data Mining”, Complex Systems, University of Alaska Anchorage, Feb 15, 2013
273. Invited Colloquium, “Scientific Data Mining”, Complex Systems, SUNY Binghamton, Binghamton NY, Feb 11, 2013
274. Invited Colloquium, “Accelerating Discovery”, Electrical Engineering Department, Technion - Israel Institute of Technology, Haifa, Israel, Dec 12, 2012

275. Invited Review Lecturer, Israel Physical Society Conference, “Accelerating Discovery”, Hebrew University, Jerusalem, Israel, Dec 9, 2012
276. Invited Speaker, “Jamming Matter for robotics applications”, US-Israel Emerging Technology Discussions, Boston MA, Nov 28, 2012
277. Invited Speaker, “Matter Compilers”, DMC 2012, Orlando FL, Nov 26, 2012
278. Invited Speaker, “The Future of 3D Printing”, NEXT: The Event for Technology, Manufacturing & Innovation, Syracuse, November 8, 2012.
279. Invited Speaker, “Citizen Science”, AAAI Fall meeting, Washington DC, Nov 2, 2012
280. Invited Speaker, “Jamming Robotics”, U of Chicago, Oct 28, 2012
281. Invited Colloquium, “Scientific Data Mining”, Stockholm University, Sweden, Oct 9, 2012
282. Invited Colloquium, “Scientific Data Mining”, EPFL, Lausanne Switzerland, Oct 8, 2012
283. Invited Speaker, “The Robotic Scientist”, Northwestern, Chicago IL. Oct 1, 2012
284. Plenary Gilberth Speaker, “Programmable Matter—The Shape of Things to Come”, National Academy of Engineering, Washington DC, Sep 30, 2012
285. keynote Speaker, “Digital Matter”, Betascope 2012, Sep 22, 2012
286. Invited Colloquium, “Scientific Data Mining”, Harvard University Applied Physics Dept, Boston MA, Sep 21, 2012
287. Invited Colloquium, “Scientific Data Mining”, Harvard University Systems Biology Dept, Boston MA, Sep 20, 2012
288. Invited Speaker, “Self Reflecting Robotics”, Annual Academy of Management meeting, Boston MA, Aug 4, 2012
289. Invited Speaker, “Evolutionary Robotics”, Institute for Advanced Studies summer school in Theoretical Physics, Princeton NJ, July 19, 2012
290. Invited Speaker, “Digital Matter”, Singularity University 2012, San Jose CA, Jun 26, 2012
291. Invited Speaker, “The new world of 3D printing”, IdeaCity 2012, Toronto ON, Jun 13, 2012
292. Invited Speaker, “The Robotic Scientist”, Stanford SLAC, Palo Alto CA. June 4, 2012
293. Invited Speaker, “Design in the age of 3D printing”, Architectural Design Symposium, London UK, May 11, 2012
294. Invited Speaker, “Biologically Inspired Robotics”, USA Science & Engineering Festival (USASEF), Washington DC, April 27, 2012
295. Invited Speaker, “Design in the age of 3D printing”, Design for Manufacturing Forum, Brooklyn NY, April 26, 2012
296. Invited Speaker, “Eureka!”, Microsoft Think Next, Tel Aviv, Israel, April 22, 2012

297. Invited Speaker, "Matter Compilers – Design in the age of 3D printing", Congress on the future of Engineering Software (COFES), Scottsdale AZ, April 13, 2012
298. Invited Symposium X Speaker, "Programmable Matter—The Shape of Things to Come", MRS Annual meeting, San Francisco CA, April 12, 2012
299. Seminar Speaker, "The Robotic Scientist", Caltech Astronomy Dept, Pasadena CA. April 11, 2012
300. Colloquium Speaker, "Automating Scientific Discovery", Brandeis University CS Dept, Waltham MA, April 5, 2012
301. Invited Speaker, "Automating Scientific Discovery", Signal processing and inference for the physical sciences, Royal Society, London UK, March 26, 2012
302. Invited Speaker, "Symbolic Data Mining", NECSI, Cambridge MA, Feb 17, 2012
303. Invited Speaker, "Bioinspired Robotics", Forum Informatik, Aachen, Germany, Jan 23, 2012
304. Invited Speaker, "My Robot is Smarter Than Yours: Cognitive Robotics and AI", Swissnex, San Francisco CA, January 19, 2012
305. Colloquium Speaker, "Programmable Matter", Rochester Inst. Of Technology, Rochester NY, Oct 26, 2011
306. Colloquium Speaker, "Machine Science", Princeton Plasma Physics Laboratory, Princeton NJ, Oct 25, 2011
307. Invited Speaker, "Data mining biological Systems", New Frontiers in Systems Biology, Rehovoth, Israel, Oct 3, 2011
308. Invited Speaker, "Frontiers in Additive Manufacturing", NAE US Frontiers of Engineering, Palo Alto, CA, September 19, 2011
309. Invited Speaker, "Programmable Matter", Perimeter Institute, Hawking wing opening ceremony, Waterloo ON, September 18, 2011
310. Invited Speaker, "Fab@Home", Maker Fair, Queens, NY, September 17, 2011
311. Colloquium Speaker, "Machine Science", Vanderbilt University, Nashville TN, Sep 8, 2011
312. Invited Speaker, "Machine Science", Acceleration Discovery: Human Computer Symbiosis 50 Years On, Park City, UT, July 25, 2011
313. Invited Speaker, "Reverse Engineering Stochastic Systems", Uncertainty in Artificial Intelligence (UAI11), Barcelona, Spain, July 16, 2011
314. Invited Plenary, "Reverse Engineering Dynamical Systems", International Conference on Complex Systems (ICCS 2011), Cambridge MA, June 27, 2011
315. Keynote Speaker, "Analysis by Synthesis", 2011 IEEE Congress on Evolutionary Computation (CEC 2011), New Orleans, LA, June 9, 2011

316. Invited Speaker, "Bioinspired Robotics", World Science Fest (WSF11), New York NY, June 4, 2011
317. Invited Plenary, "Soft Robotics", European Commission Future and Emerging Technologies (FET11), Budapest Hungary, May 5, 2011
318. Invited Panelist, "3D Printing Technologies", 3D/DC, Washington DC, April 28, 2011
319. Colloquium Speaker, "The Robotic Scientist", Union College CS Dept., Schenectady NY, April 21, 2011
320. Colloquium Speaker, "Reverse Engineering Dynamical Systems", University of Chicago Computation Institute, Chicago IL, March 7, 2011
321. Keynote Speaker, "Self Reflective Systems", Int. Workshop on Self Organizing Systems, Karlsruhe, Germany, February 24, 2011
322. Invited Speaker, "Bioprinting", American Association for the Advancement of Science (AAAS11), February 21, 2011
323. Invited Speaker, "Self Reflective Robotics", American Association for the Advancement of Science (AAAS11), February 19, 2011
324. Invited Speaker, "The Limits of Science", Science on Saturday Lecture Series, Princeton Plasma Physics Laboratory, January 29, 2011
325. Colloquium Speaker, "Self Reflective Machines", Psychology Dept., Indiana University, Bloomington IN, January 24, 2011
326. Colloquium Speaker, "Distilling Natural Laws from Experimental Data", Physics Dept., Weizmann Inst, of Science, Rehovoth, Israel, Dec 30, 2010
327. Colloquium Speaker, "Digital Materials", Pixel Club, Computer Science Dept., Technion - Israel Inst. of Technology, Haifa Israel, Dec 28, 2010
328. Invited Seminar, "Reverse Engineering Dynamical Systems", Los Alamos National Labs, Albuquerque NM, Dec 8, 2010
329. Keynote Speaker, "Mining Dynamical Systems - From Cognitive Robotics to Computational Biology", European Conference on Machine Learning (ECML 2010), Barcelona, Spain, September 22, 2010
330. Invited Speaker, "Automating Science", Philosophical Society of Washington, Washington DC, September 10, 2010.
331. Colloquium Speaker, "Analysis by Synthesis", Computer Science Dept, École Polytechnique Fédérale de Lausanne (EPFL) , Lausanne, Switzerland, September 5, 2010
332. Keynote Speaker, "Analysis by Synthesis", 9th International Conference on Evolvable Systems (ICES 2010), York, UK, September 6, 2010

333. Plenary Speaker, “Soft Evolutionary Robotics”, 12th International Conference on the Synthesis and Simulation of Living Systems (ALIFE XII), Odense, Denmark, August 20, 2010
334. Invited Speaker, “Rapid Assemblers”, Fab6, Amsterdam, Netherland, August 18, 2010
335. Invited speaker, “Automating Scientific Discovery”, Princeton Institute for Advanced Studies, Princeton NJ, 15 April 2010
336. Invited speaker and panelist, “Self Reflective Architecture”, Columbia Graduate School of Architecture, New York NY, 12 April 2010
337. Invited Speaker, “3D Printing for biological applications,” in Biofabrication: Biomedical Application of Rapid Prototyping, University of South Carolina, Charleston SC, March 19, 2010
338. Keynote Speaker, “The Robotic Scientist” IEEE Aerospace Conference, Big Sky MT, March 8, 2010
339. Colloquium Speaker, “A factory in your classroom”, University of Virginia School of Education "Tea and Technology" seminar Series, Charlottesville VA, March 4, 2010
340. Invited Plenary Speaker, “The Robotic Scientist”, Simposium Internacional de Sistemas Computacionales y Tecnologías de Información (SISCTI '10), Monterrey, Mexico, February 26, 2010
341. Invited Speaker, “The robotic Scientist”, The Perimeter Institute, Waterloo ON, Canada, February 3, 2010
342. Invited Plenary Speaker, “Automated Design and Control of experiments”, 16th Lab Automation Conf., Palm Springs CA, January 25, 2010
343. Invited Speaker, “The robotic Scientist”, Foresight Institute, Palo Alto, CA, January 16, 2010
344. Invited keynote speaker, “A factory in your classroom”, National Tech Leadership Summit, Punahou School, Honolulu HI, January 7-8, 2010
345. Colloquium Speaker, “Self-reflective Systems”, Harvard Graduate School of Architecture, Cambridge MA, November 12, 2009
346. Invited Speaker, “Robot Evolution”, Quantum to Cosmos Festival, The Perimeter Institute, Waterloo ON, Canada, October 22, 2009
347. Invited Keynote Speaker, “Reverse Engineering Dynamical Systems”, Fourteenth Portuguese Conference on Artificial Intelligence, EPIA 2009, Aveiro, Portugal, October 12, 2009
348. 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

349. Invited Colloquium, “Self-reflective and self-fabricating robotic systems”, Robotics Institute, Tufts University, Boston MA, September 24, 2009
350. Invited Keynote Speaker, “Self-reflective Systems”, European Conference on Artificial Life (ECAL 2009), Budapest, Hungary, September 14, 2009
351. Invited talk, “Self-reflective machines”, Idea City ‘09, Toronto, Canada, June 18, 2009
352. Invited talk, “Bioinspired Robotics”, Emerging Technologies Pavilion, International Robots, Vision & Motion Control exhibition, June 10, Chicago IL, 2009
353. 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
354. Invited Seminar, “3D Printing for Tissue Engineering Applications”, South Carolina bioengineering symposium, Columbia SC, April 14, 2009
355. Invited speaker, The Goldstein Lecture Series, “Self-Reflection and Self-Fabrication in robotic systems”, Technion, Israel Institute of Technology, Haifa, Israel, March 25, 2009
356. Invited Seminar, “Self-Reflection and Self-Fabrication in robotic systems”, Ben Gurion University, Be’er Sheva, Israel, March 24, 2009
357. Invited Seminar, “Robotic self-reflection and self-assembly”, Robotics Institute, Carnegie Mellon University, Pittsburg PA, February 6, 2009
358. Invited Beckman Series Speaker, “Mining experimental data for dynamical invariants, from cognitive robotics to computational biology”, Caltech, Pasadena CA, Nov 20, 2008
359. Invited Colloquium, “Mining experimental data for dynamical invariants, from cognitive robotics to computational biology” Department of Computer Science, Austin TX, Nov 7, 2008
360. Invited Colloquium, “Evolutionary Robotics” Computer Science Dept, Wells College, Aurora NY, October 31, 2008
361. 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
362. Invited Colloquium, “Mining freeform natural laws in dynamical data” Department of Biological Statistics and Computational Biology, Cornell University, October 1, 2008
363. Invited Colloquium, “Mining freeform natural laws in dynamical data” Department of Biological Statistics and Computational Biology, Cornell University, October 1, 2008
364. Invited SHARP Seminar Speaker, “What do robots dream of? On cognitive machines and other self-modeling systems”, NYU, NY, Sep 24, 2008

365. 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
366. Invited talk, Foundation of Nanoscience 2008, "Dynamically reprogrammable self-assembly at macro and micro scales", Snowbird, Utah, April 2008
367. Invited Colloquium, Santa Fe Institute, "Mining experimental data for physical laws", Santa Fe, NM, March 2008
368. Invited talk, "The future of personal fabrication", University of Pennsylvania Wharton School of management, Philadelphia PA, January 2008
369. Invited talk, NSF Engineering Research and Innovation Annual Meeting, Top advances and Emerging Areas, "Resilient machines", January 2008, Knoxville TN
370. Invited talk and panel, NSF Engineering Research and Innovation Annual Meeting, "Working with the Media", January 2008, Knoxville TN
371. Invited presentation, Light in Winter 2008, "What do robots Dream of", January 2008, Ithaca NY
372. Colloquium Speaker, Chicago University, Physics Dept, "Cognitive Robotics and other self-modeling systems", December 2007
373. Colloquium Speaker, Delaware University Biomechanics Dept Colloquium, "Biologically inspired robotics", November 2007
374. Invited Plenary Address, "Emergent Self Models in Machines", Epigenetic Robotics 2007, November 2007, Rutgers NJ
375. Colloquium Speaker, Cornell University Cognitive Science Colloquium., "Biologically inspired robotics", October 2007
376. Invited seminar, "Biologically inspired robotics", Free University of Brussels CS Dept., Brussels, Belgium, Sep 2007
377. Invited seminar, "Emergent Self Models in Machines", University of Malaga CS Dept., Malaga, Spain, Sep 2007
378. I Invited Speaker, "Multimaterial Freeform Fabrication", Symposium on Digital Fabrication, MIT, Cambridge MA, May 2007
379. Invited Plenary Address, "Emergent Self Models in Machines", Annual meeting of The Human Behavior and Evolution Society, May 2007, Williamsburg, Virginia
380. Colloquium Speaker, Carnegie Mellon University, Mechanical Engineering Dept., "Biologically inspired robotics", February 2007

381. Invited 4-lecture series, “Evolutionary Robotics”, Spring school on cognitive science and artificial intelligence, Günne at Lake Möhne, Germany, March 2007
382. Invited plenary speaker, “Robotics Innovations”, TED / Technology & Design, Monterey, CA, March 2007
383. Invited Speaker, “Machine Minds”, International Symposium on Creating Brain-Like Intelligence, Honda Research Institute Europe, Hohenstein, Germany, February 2007
384. Invited talk, “Reverse engineering biological networks”, Computational & Theoretical Biology Symposium, Rice University, December 2006
385. Colloquium, “Biologically Inspired Robotics”, Computer Science Dept, Harvard University, November 2006
386. Invited speaker, “Biologically Inspired Robotics”, Evolving Life Life Evolving, Namur, Belgium, December 2006
387. Colloquium Speaker, “Biologically Inspired Robotics”, Mechanical & Aerospace Engineering Dept, Vanderbilt University, October 2006
388. Invited Colloquium Speaker, “Emergent Self-models in Machine Minds”, Sage Center, University of California at Santa Barbara, October 2006
389. Invited Keynote Speaker, “Evolutionary Robotics”, Dana-Farber Cancer Institute Annual retreat, Boston, October 2006.
390. Invited Speaker, “Multimaterial Freeform Fabrication”, Symposium on Digital Fabrication, Pretoria, South Africa, June 2006
391. Invited Speaker, “Evolutionary Robotics and Evolutionary Design “, 50th Anniversary Summit of Artificial Intelligence, Monte Verita, Switzerland, July 2006
392. Invited Keynote Speaker, “Biologically Inspired Robotics”, Robocup 2006, Bremen, Germany, June 2006
393. Invited Keynote Speaker, “Co-evolutionary Learning in Embodied Cognitive Agents”, Artificial Life X, Bloomington, Indiana, USA June 2006
394. Invited Keynote Speaker, “Co-evolutionary embedded systems”, The 9th International Conference on Intelligent Autonomous Systems (IAS-9), Tokyo Japan, March 2006
395. Invited Speaker and Panelist, “Automating Discovery”, W.M.Keck Institute Roundtable on future directions in science, Los Angeles CA, May 2006
396. Colloquium Speaker, “Biologically Inspired Robotics: From evolving to Self-Replicating Machines”, College of Engineering, University of Vermont, April 2006
397. Colloquium Speaker, “Automating Discovery”, Department of Pharmacology, University of Texas, Feb 2006

398. Special Seminar Speaker, “Biologically Inspired Robotics: From evolving to Self-Replicating Machines”, Mechanical Engineering Department, Indian Institute of Technology (IIT) Kanpur, January 2006
399. Invited Presenter and Panelist, “Science & Technology Revolutions”, Renaissance Weekend, Charleston SC, Dec 2005
400. Invited Plenary Keynote Speaker, “Print Anything: The future of rapid prototyping”, Annual retreat, Lexmark Inc., Lexington, KY, Nov 2005
401. Invited Colloquium, “Co-evolutionary Methods in System Design and Analysis”, Exxon-Mobile Upstream Research Company, Huston TX, Nov 2005
402. Invited Colloquium, “Evolving Engineering Systems”, Rockefeller University, New York NY, Nov 2005
403. Invited Speaker, “3D Printing Functional Systems”, Symposium on Digital Fabrication, Tromso, Norway, August, 2005
404. Invited Plenary Speaker, “Evolving Engineering Systems”, Int. Conference of Systems Biology, Boston MA, October 2005
405. Invited Plenary Speaker, “Biologically Inspired Robotics”, Robotics festival and exhibition, Venice, Italy, July 2005
406. Invited Speaker, DARPA/ISAT workshop "Beyond Video", Institute for Defense Analyses, Alexandria VA, June 2005
407. Invited speaker, Microsoft Faculty Summit, “3D Tablet Application”, Redmond WA, June 2005
408. Invited Speaker, “Coevolutionary methods in Locomotion”, Locomotion Workshop, Robotics Science and Systems, MIT, June 2005
409. Invited Speaker, “Stochastically reconfiguring systems”, Modular robotics Workshop, Robotics Science and Systems, MIT, June 2005
410. Invited Colloquium Speaker, “Biology and Machines”, Physics Dept, Technion – Israel Institute of Technology, December, 2004
411. Invited Lecturer, “Computational Evolution” (Three lectures series), Winter school in theoretical physics, Hebrew University of Jerusalem, December, 2004
412. Invited colloquium speaker, “Evolved Engineering Systems”, Dept. of Ecology and Evolutionary Biology, Michigan State University, October, 2004
413. Invited Seminar, “Co-evolution for model inference”, Seminar Series in Bioinformatics, Weisman Inst of Science, October, 2004

414. Invited Speaker, DARPA-sponsored workshop on Parallel Assembly, Lansdowne, VA, June 2004
415. Invited speaker, "Innovation in evolutionary processes", In Search of Innovation – A Complex Adaptive Systems Perspective, Santa Fe, NM, June, 2004
416. Invited Colloquium Speaker, "Modularity, Regularity and Hierarchy in Evolved Systems", Dept. of Ecology and Evolutionary Biology, Cornell University, March 29, 2004
417. Invited speaker, Founders workshop, "Innovation in evolutionary processes", Santa Fe Institute for Complex Systems, Santa Fe, NM, USA, Jan 15 2004
418. Invited plenary speaker, Meeting of the National Academies, "Modularity, Regularity and Hierarchy in Evolved Engineering Systems", Irvine, CA, USA, Nov 15 2003
419. Invited speaker, Microsoft Faculty Summit, "3D Ink", Redmond WA, June 28, 2003
420. Invited speaker, "Design Automation for Complex Systems", Advanced Systems Office of the NASA Office of Space Flight, NASA JPL, Jan 14, 2003
421. Invited speaker, Mechanical Engineering Colloquium series, California Institute of Technology, May 7, 2002
422. Invited plenary speaker, NASA Workshop on Revolutionary Aerospace Systems Concepts For Human/Robotic Exploration Of The Solar System, Hampton VA, November 2001
423. Invited speaker, Workshop on Nanophysics and Bio-Electronics, Dresden, Aug 20-24, 2001
424. Invited speaker, "Evolutionary Design", Boston University, May 2001
425. Invited speaker, "Evolutionary Design", Cornell University, May 2001
426. Invited speaker, "Evolutionary Design", University of Illinois at Urbana Champaign, Apr 2001
427. Invited speaker, "Evolutionary Design", University of Washington, Apr 2001
428. Invited speaker, "Evolutionary Design", Stanford University, Apr 2001
429. Invited speaker, "Evolutionary Design", UC Berkeley, Berkeley, CA, March 2001
430. Invited speaker, "Evolutionary Design", MIT, Cambridge, MA, Feb 2001
431. Invited speaker, "Evolutionary Design", Harvard University, Cambridge, MA, Feb 2001
432. Invited speaker, "Evolutionary Design", Rice University, Austin, TX, Jan 2001
433. Invited speaker, "Evolutionary Design", Tufts University, Medford, MA, Jan 2001
434. Invited speaker, "Evolutionary Design", Northwestern University, Chicago IL, Jan 2001
435. Invited Colloquium, "Evolutionary Design", Dartmouth College - Hanover, NH, Jan 2001
436. Invited plenary speaker, ("New and Notable") Annual Biophysical Society meeting, February 20, 2001, Boston, MA, USA

- 437. Invited Talk, “Evolutionary Robotics”, IEEE Robotics and Automation, Boston Chapter, 2001
- 438. Invited Speaker, International Firefighting robot competition, Trinity College, Hartford, CT, 2001
- 439. Plenary speaker, Volen Center for Complex Systems Annual Retreat, February 21, 2001, Woods Hole, MA, USA
- 440. Colloquium Speaker, “Automated Design and Fabrication of Robotic Lifeforms”, Mechanical Engineering Department, Technion, Israel, Jan 2001
- 441. Invited talk, EXPO’2000 Shaping the future, Hannover, Germany, Aug 1-3, 2000
- 442. Plenary talk, “Automated Design Concepts, Methods, and Algorithms”, CIRP Design Seminar, Haifa Israel, May 16, 2000
- 443. Invited talk, “High order Neurons”, Workshop on Hybrid Neural Systems, NIPS 98, Breckenridge, 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 24-26, 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. **Editor-in-Chief (2013-2015)**: 3D Printing and Additive Manufacturing (3DP), Mary Ann Liebert Publishing
2. **Associate Editor, Science Robotics (2020-)**

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. (PI) "Open Source Ultrasound", Eric Schmidt Foundation, \$350K, 6/19-6/21
2. Vondrick C, Lipson H., (co-PI) "Learning Visual Dynamics from Interaction", NSF, \$750K, 10/19-9/22
3. Lipson H. (PI) "Open Source Ultrasound", Eric Schmidt Foundation, \$106K, 6/18-6/19
4. Lipson H. (PI) "Soft Actuators for Soft Robotics", IMOD, 2016-2019, \$370,000
5. Lipson H., (PI) "Auto-generative Networks", DARPA, 1/2018-12/2019, \$816K
6. Chattopadhyay, I (PI) , Lipson H. (co-PI), "ZeD: Zero information modeling", DARPA, 3/2017-2/2021, \$400K, Lipson portion \$125K
7. Lipson H. (PI), "Simultaneous Optimization and Simulation", DARPA, 1/2017-12/2020, \$989K
8. Lipson H., Grinspun E "Food Printing", SEAS SIRS, 2017-2018, \$160,000, Lipson Portion \$80K
9. Lipson H., "Voxel Advanced Digital-manufacturing for Earth and Regolith in Space ", NASA, 4/2016-7/2016, \$18K
10. Lipson H. (2016) "Self-Aware machines", Northrop Grumman Corporation 2016-2017, \$85,000
11. 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
12. Lipson H., (2015) "Text To Food: Exploration In 3D Food Printing", University of Chicago, 5/2014-4/2015, \$10,000
13. Lipson H., Labutov I. (2014) "Automatic curriculum generation from prerequisite concept networks", Metaknowledge Network, 2014-2015, \$108,882

14. Lipson H. (2013) "Simulator 3D printing electrometrical systems", IMOD, 2015-2016, \$125,000
15. Lipson H. (2014) "Matter Compilers", DARPA Open Manufacturing, 2014-2015, \$100,000
16. 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
17. Lipson H. (2013) "3D printing electrometrical systems", IMOD, 2013-2014, \$150,000
18. Lipson H. (2012) "Inverse Gillespie Algorithm", ARO, 2012-2014, \$300,000
19. Lipson H. (2012) "Matter Compilers", DARPA Open Manufacturing, 2012-2014, \$400,000
20. Lipson H. (2011) "Rapid Assemblers", DARPA M3 2011-2014, \$430,000
21. Bull G., French J., Berry R., Lipson H. (2010) "The FabLab classroom: Preparing Students for the Next Industrial Revolution", NSF 2010-2013, \$250,000
22. Bull G., Berry R., Lipson H. (2010) "Fab@School – A Digital Fabrication Laboratory for the Classroom", Motorola Foundation Innovation Generation, \$250,000, 2010-2011
23. Bull G., Berry R., Lipson H. (2010) "Fab@School – A Digital Fabrication Laboratory for the Classroom", MacArthur Reimagining Learning Competition, \$185,000, 2010-2011
24. McLean J., Wkiso J., Lipson H., (2009) "Elucidation of Leukocyte and Macrophage Biomarker Signature from Drugs of Abuse", NIH, \$2,700,000, 2009-2011
25. Lipson H., Suel G., (2009) "Distilling natural laws from experimental data", NSF, \$600,000, 2009-2012
26. Wiksw 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
27. 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.
28. Lipson H., Erickson D., Jaeger H., (2008), "Hierarchical programmable self-assembly", DARPA MTO, \$2,500,000, 2008-2011.
29. Hornby G., Lipson H., Pollack J.B., (2008), "Co-evolution of designers and critics", NSF Creative IT, \$800,000, 2008-2011.
30. Rus D., Lipson H., Yim M., Klavins E., (2007), "The reconfigurable Factory", NSF EFRI, \$2,000,000, 2007-2011.
31. Bonassar L., Butcher J, Lipson H (2007) "Multidisciplinary Approach for Engineered Heart Valves Using Novel Biomaterials," Morgan Tissue Engineering, \$96,000 2007-2008

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