Hamid Marvi

Curriculum Vitae

School for Engineering of Matter, Transport and Energy
Ira A. Fulton Schools of Engineering, Arizona State University
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BIRTH Lab, Google Scholar

EDUCATION

Ph.D.	**Georgia Institute of Technology**, Atlanta, GA; July 2013 • Advisor: David Hu • Dissertation: "The Role of Functional Surfaces in the Locomotion of Snakes" • Mechanical Engineering
M.Sc.	**Clemson University**, Clemson, SC; Dec 2009 • Mechanical Engineering
M.Sc.	**Sharif University of Technology**, Tehran, Iran; May 2007 • Thesis: "Modeling of a bio-inspired micro swimmer" • Biomedical Engineering
B.Sc.	**Iran University of Science and Technology (IUST)**, Tehran, Iran; May 2004 • Thesis: "The feasibility study of using micro turbines at hybrid vehicles" • Mechanical Engineering

PROFESSIONAL EXPERIENCE

Aug. 2021-Present	*Associate Professor (with tenure)*, Mechanical and Aerospace Engineering **Arizona State University**, Tempe, AZ
Aug. 2015-July 2021	*Assistant Professor*, Mechanical and Aerospace Engineering **Arizona State University**, Tempe, AZ

Aug. 2015- Present	*Graduate Faculty*, Biomedical Engineering *Senior Sustainability Scientist*, Julie Ann Wrigley Global Institute of Sustainability *Affiliate Faculty*, Adaptive Intelligent Materials & Systems Center (AIMS) *Affiliate Faculty*, The Biomimicry Center *Affiliate Faculty*, The Center for Human, Artificial Intelligence, and Robotic Teaming (CHART) *Affiliate Faculty*, Center for Complex System Safety (CCSS) *Honors Faculty*, Barrett, the Honors College *Founder and Director*, Bio-Inspired Robotics, Technology, and Healthcare (BIRTH) Laboratory **Arizona State University**, Tempe, AZ
Jan. 2014- July 2015	*Postdoctoral Fellow*, Mechanical Engineering **Carnegie Mellon University**, Pittsburgh, PA *Advisor: Metin Sitti*
Aug. 2014- Dec. 2014	*Lecturer*, Mechanical Engineering **Carnegie Mellon University**, Pittsburgh, PA
Aug. 2013- Jan. 2014	*Postdoctoral Fellow*, Mechanical Engineering **Georgia Institute of Technology**, Atlanta, GA *Advisors: Daniel Goldman and David Hu*

RESEARCH

HONORS & AWARDS

2018	- **Origins Project Faculty Research Award**, The Origins Project at ASU
2017 - 2018	- **KEEN Professorship**, The Kern Family Foundation
2015	- **Peebles Award** for Graduate Student Research in Adhesion Science, Adhesion Society
2014	- **Sigma Xi Best Ph.D. Thesis Award**, Georgia Institute of Technology
2013	- **Milliken & Company Travel Grant and Honorarium**, Milliken Graduate Research Symposium
2012 - 2013	- **GoSTEM Graduate Teaching Fellowship**, Georgia Tech, Goizueta Foundation

2012	- **Best Student Paper of the Year** in Four Conferences, American Society of Mechanical Engineers, Dynamic Systems and Control Division, ASME-DSCD Mechatronics (among all of the papers presented at ASME-DSCC, American Control Conference (ACC), ASME-IEEE International Conference on Advanced Intelligent Mechatronics (AIM), and International Federation of Automatic Control (IFAC) Symposium on Mechatronic Systems) - **TechSTAR Award**, Georgia Tech - **Finalist, Innovation Competition**, Georgia Tech Research and Innovation Conference - **Best Poster Award**, Georgia Tech Research and Innovation Conference - **NSF Travel Award**, Materials Research Society - **Shirley-Chan Honorary DBIO Student-travel Grant** - **DOE Travel Grant**, APS Energy Research Workshop - **NSF IOS Travel Award**, Society for Integrative and Comparative Biology
2011	- **Emerald Publishing Literati Network Award for Excellence** granted to article entitled “The Effect of Up-armoring the High-Mobility Multi-purpose Wheeled Vehicle (HMMWV) on the Off-road Vehicle Performance" - **Finalist, Best Student Paper Award** at the ASME Dynamic Systems and Control Conference, Arlington, VA - **ASME Student Travel Award**, Dynamic Systems and Control Conference

Awards to Advisees (for work I supervised)

2021	- **ARCS Scholarship**, Achievement Rewards for College Scientists (ARCS Foundation); Awarded to Reza Ahmed
2020	- **Outstanding Graduate Research Award**, ASU Graduate and Professional Student Association (GPSA); Awarded to Mahdi Ilami - **Completion Fellowship**, ASU Graduate College; Awarded to Mahdi Ilami - **Honorable Mention, NSF Graduate Research Fellowship Program**; Olga Skowronek
2018	- **Keynote Speaker at TEDx ASU**; Andrew Thoesen - **ASU-NASA SpaceGrant Fellowship**; Awarded to Andrew Thoesen - **IEEE International Conference on Robotics and Automation (ICRA) Travel Award**; Awarded to Andrew Thoesen - **ASU GPSA Travel Award**; Awarded to Andrew Thoesen - **ASU GPSA Travel Award**; Awarded to Hosain Bagheri
2017	- **2nd Place, Simulating Reality Contest by MSC Adams, University Category**; Awarded to Andrew Thoesen - **ASU GPSA Travel Award**; Awarded to Hosain Bagheri
2015 - 2020	- **ASU Master’s Opportunity for Research in Engineering (MORE) Award**; Awarded to **9** of my Master’s Students - **ASU Fulton Undergraduate Research Initiative (FURI) Award**; Awarded to **28** of my Undergraduate Students

PUBLICATIONS

Summary of Publications and Intellectual Property:

Manuscripts in Preparation: **7**
Manuscripts Submitted / In Revision: **2**
Total Journal Publications (Published, In Press, and /or Accepted): **32**
Invited Book Chapters Published / In Press: **4**
Journal Editorials: **1**
Refereed Conference Papers: **11**
Intellectual Property: International Patents Pending **3**; U.S. Patents Pending **4**; Provisional Patents **7**
Total citations according to Google Scholar: **928** (h-index=**13**, i10-index=**16**)

Note:
* indicates corresponding author.
Bold indicates ASU Ph.D. students advised.
Underline indicates ASU Master's students advised.
# indicates ASU undergraduate students advised.
‡ indicates high school students advised.
∞ indicates visiting scholars supervised.
× indicates ASU postdoctoral researcher supervised.
+ indicates equal contributions.
~ indicates presenting author.

Impact factors are either from 2018 Journal Citation Reports, Web of Science Group or 2018 CiteScore.

Journal Articles in Preparation

1. A. Das, N. Masurkar, M. Rudraboina, H. Nemati, F. Alvidrez, E. Dehghan-Niri, H. Marvi*, "A Lizard-inspired Tube Inspector Robot," *IEEE RA-L.*

2. S. Ahmadi#, S. Cummings#, C. Roy, **H. Bagheri**, B. Cota-Valenzuela, B. Cherry, M.M. Peet, S. Berman, D. Aukes, X. He, R.E. Fisher, H. Marvi*, "An Analysis of Octopus Muscle Structure and Function via Magnetic Resonance Imaging and Finite Element Analysis."

3. **M. Ilami**, D. Edwards, A. Moorthi, S. Sarkar, A. Petras, H. Marvi*, "Closed Loop Magnetic Needle Steering Without Visual Feedback."

4. **R. Ahmed**, R. Calandra, H. Marvi*, "Model-based Visual Predictive Control of Ferrofluid Droplets."

5. R. Casleton, **H. Bagheri**, A. Morgenthaler, S. Shaikh, M. Sorge, B. Tucker, M.M. Peet, S. Berman, D. Aukes, X. He, S.C. Pratt, H. Marvi, R.E. Fisher*, "Chemoreception in *Octopus bimaculoides*."

6. **H. Bagheri**, T. Hancer[#], S. Ahmadi[#], T. Ruggiero[#], P.T. Chen, B. Gregger, M.M. Peet, S. Berman, D. Aukes, X. He, R.E. Fisher, H. Marvi[*], "Experimental Verification of Arm Muscle Functionalities in *Octopus bimaculoides*."

7. **H. Bagheri**, N.K. Ofosu, B. Bethke[#], D. Aukes, J. Tao, H. Marvi[*], "A self-contained Bioinspired Robot for Effective Burrowing in Granular Media."

8. S. Vajrala, **H. Bagheri**, H. Marvi, H. Emady[*], "Impact of Non-spherical Projectiles on Dry Granular Media."

Manuscripts in Review

1. **H. Bagheri**, V. Jayanetti, H.R. Burch, C.E. Brenner[#], H. Marvi[*], "Mechanics of Bipedal and Quadrupedal Locomotion on Dry and Wet Granular Media," *Journal of Field Robotics*. *[2019 Impact factor: 3.58]*

2. S. Zamen, E. Dehghan-Niri[*], **M. Ilami**, V. Senthilkumar, H. Marvi, "Recurrence Analysis of Dry-couplant Ultrasonic Lamb Waves in Plate-like Structures," *IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control*. *[2019 Impact factor: 3.11]*

Peer-Reviewed Journal Articles

At ASU

1. C. Lo, Y. Zhao, C. Kim, Y. Alsaid, R. Khodambashi, M. Peet, R. Fisher, H. Marvi, S. Berman, D. Aukes, X. He[*], "Highly Stretchable Self-Sensing Actuator Based on Conductive Photothermally-Responsive Hydrogel," *Materials Today*, (In Press). *[2019 Impact factor: 26.42]*

2. **R.J. Ahmed**, **M. Ilami**, J. Bant[#], B. Beigzadeh[∞], H. Marvi[*], "A Shapeshifting Ferrofluidic Robot," *Soft Robotics*, (In Press). *[2020 Impact factor: 8.07]*

3. D. Atkinson, T. DSouza, J. Rajput, N. Tasnim, J. Muthuswamy, H. Marvi, J. J. Pancrazio[*], "Advances in Implantable Microelectrode Array Insertion and Positioning," *Neuromodulation: Technology at the Neural Interface*, (In Press). *[2019 Impact factor: 4.03]*

4. A. Thoesen[×], H. Marvi[*], "Planetary Surface Mobility And Exploration: A Review," *Current Robotics Reports*, (In Press).

5. H. Nemati, F. Alvidrez, A. Das, N. Masurkar, M. Rudraboina, H. Marvi, E. Dehghan-Niri[*], "Integrating Electromagnetic Acoustic Transducers into Modular Robotic Gripper for Inspection of Tubular Components," *Materials Evaluation*, (In Press). *[2019 Impact factor: 0.48]*

6. D. Li, S. Huang, Y. Tang, J. Tao, H. Marvi, D. Aukes*, "Compliant Fins for Locomotion in Granular Media," *IEEE Robotics and Automation Letters (RA-L)*, 6(3), pp 5984-5991, 2021. *[2019 Impact factor: 3.60]*

7. R. Khodambashi, Y. Alsaid, R. Rico, M.M. Peet, H. Marvi, R.E. Fisher, S. Berman, X. He*, D. Aukes*, "Heterogeneous Hydrogel Structures with Spatiotemporal Reconfigurability using Addressable and Tunable Voxels," *Advanced Materials*, 33(10), pp 2005906, 2021. *[2019 Impact factor: 27.40]*

8. **M. Ilami**, **H. Bagheri**, **R. Ahmed**+, **E. O. Skowronek**+, H. Marvi*, "Bioinspired Soft Robots: Materials, Sensors, and Actuators," *Advanced Materials*, 2003139, 2020. *[2019 Impact factor: 27.40]*

9. **A. Thoesen**, T. McBryan#, D. Mick#, M. Green#, J. Martia#, H. Marvi*, "Granular Scaling Laws for Helically-driven Dynamics," *Physical Review E*, 102, 032902, 2020. *[2019 Impact factor: 2.30]*

10. **A. Thoesen**, T. McBryan#, D. Mick#, M. Green#, J. Martia#, H. Marvi*, "Comparative performance of granular scaling laws for lightweight grouser wheels in sand and lunar simulant," *Powder Technology*, 373, pp 336-346, 2020. *[2019 Impact factor: 4.14]*

11. **M. Ilami**+, **R.J. Ahmed**+, A. Petras#, B. Beigzadeh∞, H. Marvi*, "A Magnetically Actuated Method of Needle Steering in Soft Phantom Tissue," *Nature Scientific Reports*, 10(1), pp 1-11, 2020. *[2019 Impact factor: 4.00]*

12. S. Huang, Y. Tang, **H. Bagheri**, D. Li, A. Ardente, D. Aukes, H. Marvi, J. Tao*, "Effects of friction anisotropy on upward burrowing behavior of soft robots in granular materials," *Advanced Intelligent Systems*, 1900183, 2020.

13. **H. Bagheri**, S. Cummings#, C. Roy, R. Casleton, A. Wan, N. Erjavic, A. Hu#, S. Berman, M.M. Peet, D. Aukes, X. He, S.C. Pratt, R.E. Fisher, H. Marvi*, "New Insights on the Control and Function of Octopus Suckers," *Advanced Intelligent Systems*, 1900154, 2020.

14. A. Salimi Lafmejani, A. Doroudchi, H. Farivarnejad, X. He, D. Aukes, M.M. Peet, H. Marvi, R.E. Fisher, S. Berman*, "Kinematic Modeling and Trajectory Tracking Control of an Octopus-Inspired Continuum Robot," *IEEE Robotics and Automation Letters (RA-L)*, 5(2), pp 3460-3467, 2020. *[2019 Impact factor: 3.60]*

15. **A. Thoesen**, T. McBryan#, M. Green#, D. Mick#, J. Martia#, H. Marvi*, "Revisiting Scaling Laws for Robotic Mobility in Granular Media," *IEEE Robotics and Automation Letters (RA-L)*, 5(2), pp 1319-1325, 2020. *[2019 Impact factor: 3.60]*

16. **M. Ilami**, **R.J. Ahmed**, D. Edwards, E. Thompson#, S. Zeinolabedinzadeh, H. Marvi*, "Magnetically actuated tunable soft electronics," *American Chemical Society (ACS) Omega*, 4, pp 2124221250, 2019. *[2019 Impact factor: 2.87]*

17. **A. Thoesen**, T. McBryan#, H. Marvi*, "Helically-driven Granular Mobility and Gravity-variant Scaling Factors," *Royal Society of Chemistry Advances*, 9, pp 12572-12579, 2019. *[2019 Impact factor: 3.12]*

18. **A. Thoesen**, S. Ramirez[#], H. Marvi[*], "Screw-Generated Forces in Granular Media," *American Institute of Chemical Engineering Journal*, 65(3), pp 894-903, 2019. *[2019 Impact factor: 3.52]*

19. G. Lin[+], Z. Ye[+], X. Dong[+], H. Marvi, O. Erin, W. Hu, M. Sitti[*], "Shape-programmable magnetic soft matter," *Proceedings of the National Academy of Sciences*, 201608193, 2016. *[2019 Impact factor: 9.41]*

20. H. Marvi, J. Cook, J. Streator, D. Hu[*], "Snakes Move Their Scales to Increase Friction," *Journal of Biotribology, Special Issue: Biotribology in Nature*, 5, pp 52-60, 2016. *[2019 CiteScore: 2.18]*

21. H. Marvi[+], S. Song[+], M. Sitti[*], "Experimental Investigation of Optimal Adhesion of Mushroom-like Elastomer Microfibrillar Adhesives," *Langmuir*, 31(37), pp 10119-10124, 2015. *[2019 Impact factor: 3.56]*

Before ASU

22. H. Marvi[+], Y. Han[+], M. Sitti[*], "Actively Controlled Fibrillar Friction Surfaces," *Applied Physics Letters*, 106(5), pp 051602, 2015. *[2018 Impact factor: 3.52]*

23. H. Marvi, C. Gong, N. Gravish, H. Astley, M. Travers, R. Hatton, J. Mendelson, H. Choset, D. Hu, and D. Goldman[*], "Sidewinding with minimal slip: snake and robot ascent of sandy slopes," *Science*, 346(6206), pp 224-229, 2014. *[2018 Impact factor: 41.06]*

24. H. Marvi, J. Bridges, D. Hu[*], "Snakes Mimic Earthworms: Propulsion Using Rectilinear Traveling Waves," *Journal of the Royal Society Interface*, 10(84), 2013. *[2018 Impact factor: 3.22]*

25. H. Marvi, D. Hu[*], "Friction Enhancement in Concertina Locomotion of Snakes," *Journal of the Royal Society Interface*, 9(76), pp 3067-3080, 2012. *[2018 Impact factor: 3.22]*

26. B. Vasaghi-Gharamaleki, M. Keshavarz[*], S. Gharibzadeh, M. Sotodeh, H. Marvi, J. Mosayebnejad, and I. Ebrahimi Takamjani, "Temperature Changes During and after Eccentric Contractions and its Effect on Force and Desmin Loss in Rat," *Acta Medica Iranica*, 49(4), pp 225-232, 2011. *[2018 CiteScore: 0.91]*

27. M. Grujicic[*], G. Arakere, W. C. Bell, H. Marvi, H. V. Yalavarthy, B. Pandurangan, I. Haque and G. M. Fadel, "Reliability-based Design Optimization for Durability of Ground-vehicle Suspension-system Components," *Journal of Materials Engineering and Performance*, 19(3), pp 301-313, 2010. *[2018 Impact factor: 1.48]*

28. M. Grujicic[*], T. He, H. Marvi, B. A. Cheeseman, C. F. Yen, "A Comparative Investigation of the Use of Laminate-level Meso-scale and Fracture-mechanics Enriched Meso-scale Composite-material Models in Ballistic Resistance Analyses," *Journal of Materials Science*, 45, pp 3136-3150, 2010. *[2018 Impact factor: 3.44]*

29. M. Grujicic*, H. Marvi, G. Arakere, W. C. Bell, I. Haque "The Effect of Up-armoring the High-Mobility Multi-purpose Wheeled Vehicle (HMMWV) on the Off-road Vehicle Performance," *Multidiscipline Modeling in Materials and Structures*, 6(2), pp 1169-1182, 2010. (Emerald Publishing Literati Network Award for Excellence) *[2018 CiteScore: 0.75]*

30. M. Grujicic*, H. Marvi, G. Arakere, I. Haque, "A Finite Element Analysis of Pneumatic-Tire/Sand Interactions During Off-Road Vehicle Travel," *Multidiscipline Modeling in Materials and Structures*, 6(2), pp. 284-308, 2010. *[2018 CiteScore: 0.75]*

31. B. Vasaghi-Gharamaleki, M. Keshavarz*, S. Gharibzadeh, H. Marvi, J. Mosayebnejad, and I. Ebrahimi Takamjani, "The Effect of Temperature on Eccentric Contraction-induced Isometric Force Loss in Isolated Perfused Rat Medial Gastrocnemius Muscle," *Tehran University Medical Journal*, 66(6), pp 388-395, 2008. *[2018 CiteScore: 0.24]*

32. B. Vasaghi-Gharamaleki, M. Keshavarz*, S. Gharibzadeh, M. Sotodeh, H. Marvi, J. Mosayebnejad, and I. Ebrahimi Takamjani, "The Influence of Temperature Alterations on Eccentric Contraction-Induced Isometric Force and Desmin Loss in Rat Medical Gastrocnemius Muscle," *Journal of Medical Sciences*, 8(2), pp 162-169, 2008. *[2018 Impact Factor: 0.83]*

Invited Book Chapters

1. **A. Thoesen**, H. Marvi*, "Scaling Predictions for Lightweight Lunar Rover Mobility," In *Recent Advancement in Space Robotics and Autonomous Systems*, Editor: Yang Gao, The Institute of Engineering and Technology, Stevenage, England, 2020. (In Press)

2. C. Lo, Y. Zhao, Y. Ma, S. Wu, Y. Alsaid, M.M. Peet, R.E. Fisher, H. Marvi, D. Aukes, S. Berman, X. He*, "Bioinspired Sensors and Actuators Based on Stimuli-Responsive Hydrogels for Underwater Soft Robotics," In *Bioinspired Sensing, Actuation, and Control in Underwater Soft Robotic Systems*, Editors: Derek Paley and Norman Wereley, Springer, New York, USA, pp 99-115, 2020.

3. **H. Bagheri**, S. Berman, M.M. Peet, D. Aukes, X. He, S.C. Pratt, R.E. Fisher, H. Marvi*, "Control and Functionality of Octopus Arms and Suckers," In *Bioinspired Sensing, Actuation, and Control in Underwater Soft Robotic Systems*, Editors: Derek Paley and Norman Wereley, Springer, New York, USA, pp 189-212, 2020.

4. S. Shivakumar, D. Aukes, S. Berman, X. He, R.E. Fisher, H. Marvi, M.M. Peet*, "Decentralized Estimation and Control of a Soft Robotic Arm," In *Bioinspired Sensing, Actuation, and Control in Underwater Soft Robotic Systems*, Editors: Derek Paley and Norman Wereley, Springer, New York, USA, pp 229-246, 2020.

Editorial Articles

1. H. Marvi*, G.Z. Lum*, I.D. Walker*, "Opportunities and Challenges in Soft Robotics," *Advanced Intelligent Systems*, Special Issue on Soft Robotics, 2020.

Peer-Reviewed Conference Proceedings (Full Papers)

At ASU

1. K. Carpenter, **A. Thoesen**, D. Mick[#], J. Martia[#], M. Cable, K. Mitchell, B. Wilcox, L. P. Tosi, S. Hovsepian, B. Nesmith, P. Bahrami, N. Georgiev, H. Marvi[*], "Exobiology Extant Life Surveyor (EELS)," *Earth and Space Conference*, Seattle, WA, April 2021. (14 pages)

2. **A. Thoesen**, T. McBryan[#], M. Green[#], D. Mick[#], J. Martia[#], H. Marvi[*], "Revisiting Scaling Laws for Robotic Mobility in Granular Media," *IEEE International Conference on Robotics and Automation (ICRA)*, Paris, France, June 2020. (7 pages; 42% acceptance rate; Meeting was held virtually due to COVID-19 outbreak)

3. H. Yao, R. Dai, H. Marvi, "A Robust and Efficient Cooler Design Inspired by Leaf Venation," *The 7th International Conference on Biomimetic and Biohybrid Systems (Living Machines)*, Nara, Japan, July 2019. (9 pages; Invited for oral presentation; only 50% of the accepted papers were invited)

4. A. Doroudchi, S. Shivakumar, R.E. Fisher, H. Marvi, D. Aukes, X. He, S. Berman, and M.M. Peet[*], "Decentralized Control of Distributed Actuation in a Segmented Soft Robot Arm," *IEEE Conference on Decision and Control (CDC)*, Miami Beach, FL, December 2018. (8 pages)

5. **A. Thoesen**, S. Ramirez[#], H. Marvi[*], "Screw-Powered Propulsion in Granular Media: An Experimental and Computational Study," *IEEE International Conference on Robotics and Automation (ICRA)*, Brisbane, Australia, May 2018. (6 pages; 40% acceptance rate)

6. **H. Bagheri**[~], V. Taduru, S. Panchal, S. White[#], H. Marvi[*], "Animal and Robotic Locomotion on Wet Granular Media," *The 5th International Conference on Biomimetic and Biohybrid Systems (Living Machines)*, Stanford, CA, July 2017. (12 pages)

Before ASU

7. Y. Han[+], H. Marvi[+~], M. Sitti[*], "Fiberbot: A Miniature Crawling Robot Using a Directional Fibrillar Pad," *IEEE International Conference on Robotics and Automation (ICRA)*, Seattle, WA, May 2015. (6 pages; 41% acceptance rate)

8. H. Marvi[+~], S. Song[+], M. Sitti[*], "Experimental Investigation of Maximal Adhesion of Bioinspired Micro-Fiber Adhesives with Mushroom Shaped Tip Endings," *38th Annual meeting of the Adhesion Society*, Savannah, GA, February 2015. (2 pages; Peebles Award)

9. H. Marvi[~], G. Meyers, G. Russell, D. Hu[*], "Scalybot: a Snake-inspired Robot with Active Frictional Anisotropy," *ASME Dynamic Systems and Control Conference*, Arlington, VA, November 2011. (8 pages; Invited; Best Student Paper of the Year in Mechatronics)

10. S.M. Hasheminejad*, R. Talebi~, H. Marvi, "FEM Dynamic Analysis of a Damped Composite Beam," *5th International Mechanical Engineering Conference*, Rasht, Iran, May 2001. (In Persian)

11. S.M. Hasheminejad*, R. Talebi~, H. Marvi, "Vibration Analysis of a Damped Composite Beam," *5th International Mechanical Engineering Conference*, Rasht, Iran, May 2001. (In Persian)

International Patents Pending

At ASU

1. H. Marvi, **M. Ilami**, "System and Method for Determining Position of a Steerable Assembly within Tissue of an Animal Body," Patent Cooperation Treaty (PCT) International Patent Application, PCT/US20/62398, November 2020.

2. H. Marvi, **M. Ilami**, **R. J. Ahmed**, "Systems and Methods for Controlling Shape and Position of a Ferrofluid Droplet," PCT International Patent Application, PCT/US20/47892, August 2020.

3. H. Marvi, **M. Ilami**, **R. J. Ahmed**, "Magnetic Needle Steering Systems and Methods," PCT International Patent Application, PCT/US20/24225, March 2020.

U.S. Patents Pending

At ASU

1. H. Marvi, T.W. Lee, B. Beigzadeh∞, **H. Bagheri**, "Systems and Methods for an Amphibious Submersible for Pipe Interior and Wall Inspection," U.S. Provisional Patent, 17/201,616, March 2021.

2. H. Marvi, **A. Thoesen**, M. Green#, J. Martia#, "Systems and Methods for a Multi-modal Screw Propelled Excavation," U.S. Patent Application, 17/105,011, November 2020.

3. H. Marvi, E. Niri, **M. Ilami**, "Systems and Methods for a Lizard-Inspired Tube Inspector Robot," U.S. Patent Application, 16/844,519, March 2020.

4. H. Marvi, **M. Ilami**, **R. J. Ahmed**, "Magnetically Actuated Tunable Soft Electronics," U.S. Patent Application, 16/809,999, March 2020.

Provisional Patents

At ASU

1. H. Marvi, **M. Ilami**, R. Shirsavar, "Magnetohydrodynamic for remote control of fluid flow," U.S. Provisional Patent, 63/146,384, February 2021.
2. H. Marvi, **E. O. Skowronek**, **M. Ilami**, **R. J. Ahmed**, "Morphing Magnetic Soft Robots (MMSbots)," U.S. Provisional Patent, 63/111,493, November 2020.
3. H. Marvi, E. Niri, **M. Ilami**, "Adaptive Configurable Sensing Network (ACSN)," U.S. Provisional Patent, 62/924,294, October 2019.
4. H. Marvi, B. Beigzadeh∞, **M. Ilami**, "A Beetle-inspired Pipe Cleaning Robot," U.S. Provisional Patent, 62/831,275, April 2019.

Before ASU

5. H. Marvi, G. Meyers, D. Hu, J. Glisson, A. Hirabayashi, A. Pavone, "Scalybot," U.S. Provisional Patent, 61/561,574, November 2011.
6. R. Taghavi Zenouz, J. Mosayyebnejad, H. Marvi, "Method and Apparatus for Automatic Sampling of a Pressure Distribution Using Scanning Valve," Iranian Patent Office, 35572, July 2006.
7. H. Marvi, J. Mosayyebnejad, M. Keshavarz, B. Vasaghi Gharamaleki, "Method and Apparatus for Generating and Recording the Eccentric Contraction of Muscle," Iranian Patent Office, 35940, August 2006.

PRESENTATIONS

Summary of Presentations:

Invited Presentations - External: **39**
Invited Presentations - ASU Internal: **4**
Peer-reviewed Conference Presentations (Oral), including ASU students: **29**
Peer-reviewed Conference Presentations (Poster), including ASU students: **23**
Non-refereed Conference Presentations (Total): **8**

Invited Presentations (External)

1. **3rd International Webinar on Stroke, Neurology Disorders and Therapeutics**, March 2021. (Plenary Speaker)

2. **6th International Conference of Manufacturing Engineering (ICME 2021)**, March 2021. (Keynote Speaker)
3. **NASA JPL**, Mechanical Systems Technical Seminar Series, March 2021.
4. **The University of Toledo**, Department of Mechanical, Industrial, and Manufacturing Engineering, Graduate Seminar Series, February 2021.
5. **The University of Leeds**, Institute of Robotics, Autonomous Systems and Sensing (IRASS), November 2020.
6. **IEEE International Conference on Intelligent Robots and Systems (IROS)**, Tutorial on Bio-Inspired Robotics, October 2020.
7. **Medtronic Technology Center**, Technical Forum, September 2020.
8. **IEEE International Conference on Robotics and Automation (ICRA)**, Workshop on Opportunities and Challenges in Space Robotics, Paris, France, June 2020. (Meeting was held virtually due to COVID-19 outbreak)
9. **The University of Arizona, College of Medicine**, Phoenix, AZ, February 2020.
10. **IEEE International Conference on Robotics and Automation (ICRA)**, Workshop on Opportunities and Challenges in Soft Robotics Across Length Scales, Montreal, Canada, May 2019.
11. **NASA Jet Propulsion Lab (JPL)**, Pasadena, CA, January 2019.
12. **Georgia Institute of Technology**, School of Mechanical Engineering, Atlanta, GA, June 2018.
13. **National Congress for Theoretical & Applied Mechanics**, Symposium on Mechanics in Biology, Chicago, IL, June 2018.
14. **New Mexico State University**, College of Engineering Distinguished Lecture Series, Las Cruces, NM, March 2018.
15. **IEEE International Conference on Intelligent Robots and Systems (IROS)**, Workshop on Robotic-inspired Biology, Vancouver, Canada, September 2017.
16. **Intel**, Chandler, AZ, August 2017.
17. **Medtronic**, Tempe, AZ, July and September 2016.
18. **University of Pennsylvania**, GRASP Lab, Philadelphia, PA, June 2016.
19. **2nd World Congress on Automation and Robotics**, Philadelphia, PA, June 2016.
20. **University of Nevada at Reno**, Department of Mechanical Engineering, Reno, NV, March 2016.

Before ASU

21. **Ecole Polytechnique Federale de Lausanne (EPFL)**, School of Engineering, Lausanne, Switzerland, April 2015.
22. **EPFL**, Institute of Microengineering, Lausanne, Switzerland, March 2015.
23. **University of Maryland**, Department of Mechanical Engineering, College Park, MD, March 2015.
24. **Penn State University**, Department of Mechanical and Nuclear Engineering, University Park, PA, February 2015.
25. **The University of Utah**, Department of Mechanical Engineering, Salt Lake City, UT, February 2015.
26. **University of Illinois at Urbana-Champaign**, Department of Aerospace Engineering, Urbana, IL, January 2015.
27. **Iowa State University**, Department of Mechanical Engineering, Ames, IA, January 2015.
28. **Stony Brook University**, Department of Mechanical Engineering, Stony Brook, NY, April 2014.
29. **Texas A&M University-Corpus Christi**, Department of Mechanical Engineering and Engineering Technology, Corpus Christi, TX, March 2013.
30. **University of Tulsa**, Department of Mechanical Engineering, Tulsa, OK, February 2013.
31. **University of Illinois at Chicago**, Department of Mechanical and Industrial Engineering, Chicago, IL, January 2013.
32. **Georgia Institute of Technology**, Parker H. Petit Institute of Bioengineering and Biosciences, Workshop on Magnetic Resonance, Atlanta, GA, December 2012.
33. **MIT**, Department of Mechanical Engineering, Biomimetics Robotics Lab, Cambridge, MA, November 2012.
34. **Georgia Institute of Technology**, School of Physics, Physics of Living Systems (PoLS) seminar series, Atlanta, GA, November 2012.
35. **UC Berkeley**, Department of Integrative Biology, Biomechanics Seminar Series, Berkeley, CA, May 2012.
36. **Stanford University**, Department of Mechanical Engineering, Biomimetics and Dextrous Manipulation Lab, Stanford, CA, May 2012.
37. **MIT**, Department of Material Science and Engineering, Ortiz Lab, Cambridge, MA, February 2012.

38. **Johns Hopkins University**, Department of Mechanical Engineering, RPK Lab, Baltimore, MD, November 2011.

39. **Georgia Institute of Technology**, Parker H. Petit Institute of Bioengineering and Biosciences, GaP Seminar Series, Atlanta, GA, October 2011.

Invited Presentations (ASU Internal)

1. **Department of Animal Care and Technologies (DACT)**, Tempe, AZ, May 2020 (postponed due to COVID-19 outbreak).

2. **School for Engineering of Matter, Transport & Energy**, Annual Advisory Board Meeting, Tempe, AZ, December 2018.

3. **School of Biological and Health Systems Engineering**, Tempe, AZ, September 2016.

4. **School for Engineering of Matter, Transport, and Energy**, Tempe, AZ, February 2015.

Peer-Reviewed Conference Presentations (Oral)

At ASU

1. H. Nemati[~], F. Alvidrez, A. Das, N. Masurkar, M. Rudraboina, H. Marvi, E. Dehghan-Niri[*], "Toward Automated Ultrasounic Inspection of Pipelines and Tubular Components," *The American Society for Nondestructive Testing Annual Conference*, Phoenix, AZ, November 2021.

2. M. Sorge[~], Y. Zhao, H. Marvi, R. Fisher[*], "Functional Specialization and Arm Length in Octopus bimaculoides," *Experimental Biology*, April 2021.

3. **H. Bagheri**[~], Z. Huang[∞], D. Lentink, H. Marvi[*], "The Role of Basilisk Lizard Toe Fringes in Effective Water Running," *Society for Integrative and Comparative Biology*, January 2021.

4. H. Nemati[~], **M. Ilami**, J. Bhadra, H. Marvi, E. Niri[*], "Evaluation of curvature effects on the Performance of an Integrated Robotic Gripper Equipped with Electromagnetic Acoustic Transducers," *The American Society for Nondestructive Testing Annual Conference*, November 2020.

5. S. Zamen[~], **M. Ilami**, V. Senthilkumar, H. Marvi, E. Niri[*], "Experimental Evaluation of Friction Effects on Lamb Waves Generation," *The American Society for Nondestructive Testing Annual Conference*, November 2020.

6. **H. Bagheri**[~], M. Gambatese[#], D. Lentink, H. Marvi[*], "Basilisk Lizard Bipedal Locomotion on Sand, Mud, and Water: An Insight to Future Morphing Amphibious Robots," *APS March Meeting*, Denver, CO, March 2020 (Meeting cancelled due to COVID-19 outbreak).

7. **A. Thoesen**~, M. Green#, D. Mick#, T. McBryan#, H. Marvi*, "Development of a Screw Propelled Vehicle for Mobility on the Lunar Simulant BP-1," *Southwest Robotics Symposium*, Tempe, AZ, January 2019.

8. **H. Bagheri**~, S. Cummings#, C. Roy, R. Casleton, A. Wan, N. Erjavic, A. Hu#, S. Berman, M. Peet, D. Aukes, X. He, R.E. Fisher, H. Marvi*, "Octopus Sucker Adhesion and Suction Performance," *Society for Integrative and Comparative Biology*, Tampa, FL, January 2019.

9. **H. Bagheri**, V. Jayanetti~, H. Burch, C.E. Brenner#, J.K. Arnold#, H. Marvi*, "A Bio-Inspired Robot for Locomotion on Dry and Wet Granular Media," *Society for Integrative and Comparative Biology*, Tampa, FL, January 2019.

10. **A. Thoesen**~, S. Ramirez#, H. Marvi*, "Revisiting Screw-propelled Vehicles Utilizing Experimental and Computational Methods," *13th World Congress on Computational Mechanics*, New York City, NY, July 2018.

11. **H. Bagheri**~, V. Jayanetti, H. Burch#, H. Marvi*, "Basiliskbot: A bio-inspired Robot for Locomotion on Wet Granular Media," *18th U.S. National Congress for Theoretical and Applied Mechanics*, Chicago, IL, June 2018.

12. **H. Bagheri**~, A. Gendt, S. Subramanian‡, S. Berman, M. Peet, D. Aukes, X. He, R.E. Fisher, H. Marvi*, "Switchable Fibrillar Adhesives Under Different Degrees of Saturation," *Materials Research Society Spring Meeting*, Phoenix, AZ, April 2018.

13. Y. Xu~, M. Sun, R. Y. Zhao, X. Qian, S. Berman, M. Peet, R.E. Fisher, H. Marvi, D. Aukes, X. He*, "Multi-responsive Tactile Hydrogels as Soft Robotic Materials," *Materials Research Society Spring Meeting*, Phoenix, AZ, April 2018.

14. M. Qin, M. Sun, X. Qian, Y. Xu, S. Berman, M. Peet, R.E. Fisher, H. Marvi, D. Aukes, X. He~*, "Ultra-sensitive, Highly-selective, Real-time Chemical Wearable Sensors and Soft Artificial Muscle," 9th Annual Bay Area Biomedical Device Conference, San Jose, CA, March 2018.

15. **M. Ilami**~, K. Elamvazhuthi, R. Ahmed, S. Berman, H. Marvi*, "An Experimentally Verified Nonlinear PDE Model for Ferrofluids," *Southwest Robotics Symposium*, Tempe, AZ, January 2018.

16. **H. Bagheri**~, V. Jayanetti, H. Burch#, H. Marvi*, "Basilisk Lizards Transition Strategies from Land to Water," *Southwest Robotics Symposium*, Tempe, AZ, January 2018.

17. **H. Bagheri**~, A. Gendt, S. Cummings#, S. Subramanian‡, S. Berman, M. Peet, D. Aukes, X. He, R.E. Fisher, H. Marvi*, "Octopus Sucker Adhesion and Suction Performance," *Southwest Robotics Symposium*, Tempe, AZ, January 2018.

18. **A. Thoesen**~, S. Ramirez#, H. Marvi*, "Revisiting Screw-propelled Vehicles Utilizing Experimental and Computational Methods," *Southwest Robotics Symposium*, Tempe, AZ, January 2018.

19. **A. Thoesen**[~], S. Ramirez[#], H. Marvi[*], "Assessing Screw-Generated Force in Glass Beads Utilizing Experiments, DEM, and Analytical Methods," *Southwest Robotics Symposium*, Tempe, AZ, January 2018.

20. **H. Bagheri**[~], A. Gendt, S. Cummings[#], S. Subramanian[‡], S. Berman, M. Peet, D. Aukes, X. He, R.E. Fisher, H. Marvi[*], "Octopus Sucker Adhesion and Suction Performance Under Various Environmental Conditions," *Society for Integrative and Comparative Biology*, San Francisco, CA, January 2018.

21. **H. Bagheri**, V. Jayanetti, H. Burch[#~], H. Marvi[*], "Basilisk Lizards Transition Strategies from Land to Water," *Society for Integrative and Comparative Biology*, San Francisco, CA, January 2018.

22. M. Qin, X. Qian, M. Sun, S. Berman, M. Peet, R.E. Fisher, H. Marvi, D. Aukes, X. He[~*], "Bioinspired Adaptive Materials for Optical Molecular Sensing and Artificial Phototropism," Canadian Society for Chemistry Conference and Exhibition, Toronto, Canada, May 2017.

23. S. Vajrala[~], **H. Bagheri**, H. Marvi, H. Emady[*], "Impact of projectiles of different geometries on dry granular media using DEM simulations," *American Physical Society March Meeting*, New Orleans, LA, March 2017.

24. K. Farrell[#~], Z. Zhao, Q. Wang, D. Elson[#], X. He, H. Marvi[*], "Heat and pH activated Fibrillar Adhesives," *Materials Research Society Spring Meeting*, Phoenix, AZ, April 2017.

25. **A. Thoesen**[~], E. Asphaug, H. Marvi[*], "Experimental and Computational Characterization of Granular Media at Microgravity with Electrostatic Forces," *Materials Research Society Spring Meeting*, Phoenix, AZ, April 2017.

26. **H. Bagheri**[~], S. Vajrala, V. Taduru, S. White[#], D. Lee[#], H. Emady, H. Marvi[*], "Experimental and Computational Characterization of Wet Granular Media," *Materials Research Society Spring Meeting*, Phoenix, AZ, April 2017.

27. **H. Bagheri**[~], S. Vajrala, V. Taduru, S. White[#], D. Lee[#], A. Pazouki, H. Emady, H. Marvi[*], "Locomotion on Wet Granular Media," *Society for Integrative and Comparative Biology*, New Orleans, LA, January 2017.

28. **H. Bagheri**[~], S. Vajrala, H. Emady, H. Marvi[*], "Locomotion on Complex Deformable Terrain," *International Mechanical Engineering Congress & Exposition*, Phoenix, AZ, November 2016.

29. **M. Ilami**[~], N. Stephanopoulos, H. Marvi[*], "Reconfigurable DNA Nanorobots," *International Mechanical Engineering Congress & Exposition*, Phoenix, AZ, November 2016.

Before ASU

30. H. Marvi, J. Cook, J. Streator~, D. Hu*, "Snake Scales: Flexible Cleats for Climbing Deformable Substrates," *Society of Tribologists and Lubrication Engineers (STLE) Tribology Frontiers Conference*, Chicago-Rosemont, IL, October 2014.

31. H. Marvi~, C. Gong, M. Tesch, N. Gravish, R. Hatton, J. Mendelson, H. Choset, D. Hu, H. Astley, D. Goldman*, "Using Sidewinder rattlesnakes to inform design of robotic devices: the beauty of multidisciplinary research teams," *Joint Meeting of Ichthyologists and Herpetologists*, Chattanooga, TN, August 2014.

32. H. Marvi~, J. Streator, D. Hu*, "Friction Enhancement in Snake Locomotion," *Society for Industrial and Applied Mathematics (SIAM) Annual Meeting*, Chicago, IL, July 2014.

33. H. Marvi~, C. Gong, M. Travers, N. Gravish, J. Mendelson, R. Hatton, H. Choset, D. Hu, D. Goldman*, "Sidewinding as a Control Template for Climbing on Sand," *APS March Meeting*, Denver, CO, March 2014.

34. H. Marvi~, C. Gong, N. Gravish, J. Mendelson, R. Hatton, H. Choset, D. Hu, D. Goldman*, "Sidewinding as a Control Template for Climbing on Sand," *Society for Integrative and Comparative Biology (SICB) Annual Meeting*, Austin, TX, January 2014.

35. H. Marvi~, C. Gong, N. Gravish, J. Mendelson, R. Hatton, H. Choset, D. Goldman, D. Hu*, "Sidewinding as a Control Template for Climbing on Sand," *66th Annual Meeting of APS Division of Fluid Dynamics*, Pittsburgh, PA, November 2013.

36. H. Marvi~, C. Gong, N. Gravish, J. Mendelson, R. Hatton, H. Choset, D. Hu, D. Goldman*, "Sidewinding Snakes on Sand," *Southeast Regional Society for Integrative and Comparative Biology (SESICB) Meeting*, Atlanta, GA, September 2013.

37. H. Marvi~, R. Chrystal, J. Shieh, J. Mendelson, R. Hatton, H. Choset, D. Goldman, D. Hu*, "Sidewinding Snakes on Sand," *Society for Integrative and Comparative Biology (SICB) Annual Meeting*, San Francisco, CA, January 2013.

38. H. Marvi~, J. Streator, D. Hu*, "Snakeskin Tribology," *Materials Research Society (MRS) Fall Meeting*, Boston, MA, November 2012.

39. H. Marvi~, D. Dimenichi, R. Chrystal, J. Mendelson, D. Goldman, D. Hu*, "Sidewinding Snakes on Sand," *65th Annual Meeting of APS Division of Fluid Dynamics*, San Diego, CA, November 2012.

40. H. Marvi~, J. Streator, D. Hu*, "Snakeskin Tribology: How Snakes Generate Large Frictional Anisotropy," *American Physical Society (APS) March Meeting*, Boston, MA, February 2012.

41. H. Marvi~, J. Cook, and D. Hu*, "Rectilinear Locomotion of Snakes and the Design of Scalybot 2," *Society for Integrative and Comparative Biology (SICB) Annual Meeting*, Charleston, SC, January 2012.

42. H. Marvi~, D. Hu*, "Concertina Locomotion of Snakes," *63rd Annual Meeting of APS Division of Fluid Dynamics*, Long Beach, CA, November 2010.

Peer-Reviewed Conference Presentations (Poster)

At ASU

1. **A. Thoesen**~, T. McBryan#, D. Mick#, M. Green#, J. Martia#, H. Marvi*, "Performance of Granular Scaling Laws for Lightweight Grouser Wheels in Lunar Simulant," *Workshop on Opportunities and Challenges in Space Robotics; IEEE International Conference on Robotics and Automation (ICRA)*, Paris, France, June 2020. (Meeting was held virtually due to COVID-19 outbreak)

2. **A. Thoesen**~, T. McBryan#, D. Mick#, M. Green#, J. Martia#, H. Marvi*, "Helical Locomotion Scaling Model in Lunar Simulant," *Workshop on Opportunities and Challenges in Space Robotics; IEEE International Conference on Robotics and Automation (ICRA)*, Paris, France, June 2020. (Meeting was held virtually due to COVID-19 outbreak)

3. R. Casleton~, A. Morgenthaler, S. Shaikh, M. Sorge, B. Tucker, I. Essendrup, S. Berman, M. Peet, D. Aukes, X. He, H. Marvi, R.E. Fisher*, "Chemoreception in *Octopus bimaculoides*," *Society for Integrative and Comparative Biology (SICB) Annual Meeting*, Austin, TX, January 2020.

4. **M. Ilami**~, **R. Ahmed**, D. Edwards, S. Zeinolabedinzadeh, H. Marvi*, "Variable Soft Electronics with Magnetic Actuation," *Biomedical Engineering Society (BMES) Annual Meeting*, Philadelphia, PA, October 2019.

5. **R. Ahmed**, **M. Ilami**, A. Petras~, B. Beigzadeh‡‡, H. Marvi*, "Magnetic Actuation for Needle Steering in Soft Phantoms," *Biomedical Engineering Society (BMES) Annual Meeting*, Philadelphia, PA, October 2019.

6. **R. Ahmed**~, **M. Ilami**, E. Faillace, J. Bant#, H. Marvi*, "Data-driven Modeling of Magnetically Actuated Ferrofluids," *Biomedical Engineering Society (BMES) Annual Meeting*, Philadelphia, PA, October 2019.

7. **H. Bagheri**~, A. Hu, S. Cummings#, C. Roy, R. Casleton, A. Wan, N. Erjavic, S. Berman, M. Peet, D. Aukes, X. He, R.E. Fisher, H. Marvi*, "Functionality of Octopus Suckers," *Workshop on Opportunities and Challenges in Soft Robotics Across Length Scales; IEEE International Conference on Robotics and Automation (ICRA)*, Montreal, Canada, May 2019.

8. S. Cummings#, C. Roy, B. Cherry, B. Cota Valenzuela, X. He, D. Aukes, S. Berman, M. Peet, H. Marvi~, R.E. Fisher*, "Analysis of Octopus Arm Muscles Using Contrast-Enhanced Magnetic Resonance Imaging," *Workshop on Opportunities and Challenges in Soft Robotics Across Length Scales; IEEE International Conference on Robotics and Automation (ICRA)*, Montreal, Canada, May 2019.

9. **A. Thoesen**~, M. Green#, D. Mick#, T. McBryan#, H. Marvi*, "Development of a Screw Propelled Vehicle for Mobility on the Lunar Simulant BP-1," *Southwest Robotics Symposium*, Tempe, AZ, January 2019.

10. **H. Bagheri**~, A. Gendt, S. Cummings#, S. Subramanian‡, S. Berman, M. Peet, D. Aukes, X. He, R.E. Fisher, H. Marvi*, "Functionality of Octopus Suckers," *Southwest Robotics Symposium*, Tempe, AZ, January 2019.

11. **M. Ilami**~, K. Elamvazhuthi, **R. Ahmed**, S. Berman, H. Marvi*, "An Experimentally Verified Nonlinear PDE Model for Ferrofluids," *Southwest Robotics Symposium*, Tempe, AZ, January 2018.

12. **H. Bagheri**~, V. Jayanetti, H. Burch#, H. Marvi*, "Basilisk Lizards Transition Strategies from Land to Water," *Southwest Robotics Symposium*, Tempe, AZ, January 2018.

13. **H. Bagheri**~, A. Gendt, S. Cummings#, S. Subramanian‡, S. Berman, M. Peet, D. Aukes, X. He, R.E. Fisher, H. Marvi*, "Octopus Sucker Adhesion and Suction Performance," *Southwest Robotics Symposium*, Tempe, AZ, January 2018.

14. **A. Thoesen**~, S. Ramirez#, H. Marvi*, "Revisiting Screw-propelled Vehicles Utilizing Experimental and Computational Methods," *Southwest Robotics Symposium*, Tempe, AZ, January 2018.

15. **A. Thoesen**~, S. Ramirez#, H. Marvi*, "Assessing Screw-Generated Force in Glass Beads Utilizing Experiments, DEM, and Analytical Methods," *Southwest Robotics Symposium*, Tempe, AZ, January 2018.

16. **A. Thoesen**~, H. Marvi*, "Simulated novel approaches to asteroid mobility," *TEDxASU symposium*, Tempe, AZ, March 2017.

17. **M. Ilami**~, K. Ramagiri, E. Fisher, M. Bejarano#, V. Ajjampur#, A. Apostol#, H. Marvi*, "Magnetic Microrobots for Medical Applications," *TEDxASU symposium*, Tempe, AZ, March 2017.

18. **H. Bagheri**~, S. Vajrala, V. Taduru, S. White#, D. Lee#, H. Emady, H. Marvi*, "Simulation of Robotic Systems on Granular Media," *TEDxASU symposium*, Tempe, AZ, March 2017.

19. **M. Ilami**~, K. Ramagiri, E. Fisher, M. Bejarano#, V. Ajjampur#, A. Apostol#, H. Marvi*, "Magnetic Microrobots for Medical Applications," *5th ASU Rehabilitation Robotics Workshop*, Tempe, AZ, February 2017.

20. **H. Bagheri**~, S. Vajrala, V. Taduru, S. White#, D. Lee#, H. Emady, H. Marvi*, "Simulation of Robotic Systems on Granular Media," *International Mechanical Engineering Congress & Exposition*, Phoenix, AZ, November 2016.

21. **A. Thoesen**~, H. Marvi*, "Simulated novel approaches to asteroid mobility," *International Mechanical Engineering Congress & Exposition*, Phoenix, AZ, November 2016.

22. K. Farrell[#~], D. Elson[#], H. Marvi[*], "Switchable Adhesives for Space Applications," *International Mechanical Engineering Congress & Exposition*, Phoenix, AZ, November 2016.

23. **M. Ilami**[~], K. Ramagiri, E. Fisher, M. Bejarano[#], V. Ajjampur[#], A. Apostol[#], H. Marvi[*], "Magnetic Microrobots for Medical Applications," *International Mechanical Engineering Congress & Exposition*, Phoenix, AZ, November 2016.

Non-Refereed Conference Presentations

1. **H. Bagheri**[~], B. Bethke[#], D. Stockwell, N. Okwae, D. Aukes, J. Tao, H. Marvi[*], "A Helically Driven Self-Burrowing Robot," *NSF Workshop on Signals in the Soil*, September 2020. (*Poster*)

2. **H. Bagheri**[~], V. Taduru, S. White[#], H. Marvi[*], "Basiliskbot: A Basilisk Inspired Robot," *Biomimicry and nature-inspired design exhibition at the Tempe Center for the Arts*, Tempe, AZ, May 2017. (*Poster*)

3. H. Astley[~], C. Gong, M. Serrano, H. Marvi, H. Choset, J. Mendelson, D. Hu, and D. I. Goldman[*], "Cybernetic Sidewinders: Modulation of Orthogonal Body Waves Enables Versatile Maneuverability," *International Physics of Living Systems Network (iPoLS) Annual Meeting*, Munich, Germany, July 2014.

4. H. Marvi[*~], "The Role of Functional Surfaces in the Locomotion of Snakes," *Purdue Prospective Faculty Workshop*, West Lafayette, IN, March 2014. (*Poster*)

5. H. Marvi[*~], "Friction Control in Snakes and Snake Robots," *Milliken Graduate Research Symposium*, Spartanburg, SC, March 2013.

6. A. Dickerson, S. Bolan, H. Marvi[*~], "GoSTEM Fellows at Radloff Middle and Meadowcreek High School," *Celebrating Teaching Day at Georgia Tech*, Atlanta, GA, March 2013. (*Poster*)

7. H. Marvi[~], D. Hu[*], "The Role of Functional Surfaces in the Locomotion of Snakes," *Physics of Living Systems Student Research Network (PoLS SRN) meeting*, New Haven, CT, July 2012.

8. H. Marvi[~], G. Meyers, J. Cook, E. Chang, D. Hu[*], "Scalybot: A Snake-inspired Robot," *Physics of Living Systems Student Research Network (PoLS SRN) meeting*, New Haven, CT, July 2012. (*Poster*)

9. H. Marvi[~], G. Meyers, J. Cook, E. Chang, D. Hu[*], "Scalybot: A Snake-inspired Robot," *Georgia Tech Research and Innovation Conference*, Atlanta, GA, February 2012. (*Poster*)

FUNDING SOURCES

Summary of Research Support:

Total amount of all awards in which Dr. Marvi is the PI or co-PI: **$12,027,714**
Dr. Marvi's share (recognition) in all awards as PI or co-PI: **$1,136,926**
Total amount of all awards in which Dr. Marvi is the PI/ASU PI: **$831,660**

Awarded

2021 - 2023 *Co-Principal Investigator (ASU PI)*, "Enceladus Extant Life Surveyor for Exploring Ocean Worlds"
Jet Propulsion Laboratory (JPL)
• **$9,000,000** total (*ASU's share: $295,163; Dr. Marvi's share: $295,163*)
• External Collab.: Kalind Carpenter (PI, JPL)
• Goal: To develop a bio-inspired robot for surveying life on Enceladus and exploring ocean worlds.

2021 *Principal Investigator*, "MMSBots: Morphing Magnetic Soft Robots"
ASU Center for Complex System Safety
• **$10,000** total (*Dr. Marvi's share: $10,000*)
• Goal: To develop a magnetic soft robot capable of making morphological and functional adaptations.

2020 - 2021 *Co-Principal Investigator*, "Octopus-Inspired Printing of Soft Multi-Material Structures Informed by Mobile EMG"
Department of Defense (DoD): Office of Naval Research (ONR), Defense University Research Instrumentation Program (DURIP)
• **$175,220** total (*ASU's share: $175,220; Dr. Marvi's share: $108,702*)
• Collab. at ASU: Daniel Aukes (PI), Kenan Song (Co-PI)
• Goal: To automate and ramp up soft octopus-inspired arm fabrication with distributed sensing and actuation.

2018 - 2021 *Co-Principal Investigator (ASU PI)*, "A Lizard-inspired Tube Inspector (LTI) Robot"
DOE National Energy Technology Lab (DOE NETL)
• **$400,000** total (*ASU's share: $197,763; Dr. Marvi's share: $197,763*)
• External Collab.: Ehsan Dehghan-Niri (PI, New Mexico State University (NMSU))
• Goal: To develop a bio-inspired robot with friction-based mobility and point-based ultrasound imaging that uses Lamb ultrasound waves from communication of couplant-free ultrasound transducers.

2017 - 2021 *Co-Principal Investigator*, "Octopus-inspired Autonomous Arms for Soft Robotics with Adaptive Motions"
DOD: ONR
• **$2,000,000** total (*ASU's share: $1,378,094; Dr. Marvi's share: $344,522*)
• Collab. at ASU: Spring Berman (Co-PI), Daniel Aukes (Co-PI), Matthew Peet (Co-PI)
• External Collab.: Ximin He (PI, UCLA), Rebecca Fisher (Co-PI, UA)
• Goal: To create a framework for design, rapid prototyping, and control of robust, energy-efficient, autonomous soft arms with octopus-inspired distributed sensing and actuation.

2019 - 2020 *Principal Investigator*, "Self-Navigating and Self-Extricating Amphibious Submersible for Pipe Interior and Wall Inspection, with Visual, Sonar Imaging and Laser Scanning Probes"
Salt River Project (SRP)
• **$60,000** total (*ASU's share: $60,000; Dr. Marvi's share: $30,000*)
• Collab. at ASU: T.W. Lee (Co-PI)
• Goal: To develop an amphibious robot for autonomous inspection of water pipes.

2019 - 2020 *Co-Principal Investigator*, "EAGER SitS: Active Self-Boring Robots that Enable Next Generation Dynamic Underground Wireless Sensing Networks: Fusion of Fast Prototyping, Modeling and Learning"
NSF Signals in the Soil (SitS) program
• **$315,997** total (*ASU's share: $315,997; Dr. Marvi's share: $104,279*)
• $15,997 of the above amount is through an REU Supplement
• Collab. at ASU: Junliang Tao (PI), Daniel Aukes (Co-PI)
• Goal: To develop bio-inspired self boring robots that enable dynamic underground wireless sensing networks.

2018 - 2019 *Principal Investigator*, "Octopus-inspired Decentralized Control Strategies for Highly Deformable Soft Robots"
The ASU DoD Seed Program
• **$40,000** total (*Dr. Marvi's share: $20,000*)
• Collab. at ASU: Spring Berman (Co-PI)
• External Collab.: Rebecca Fisher (Co-PI, UA)
• Goal: To develop a paradigm for sensory-motor control of highly deformable soft robots inspired by the distributed nervous system of the octopus.

2018 *Principal Investigator*, "Robotic mobility on asteroids"
The Origins Project at ASU
• **$2,500** total (*Dr. Marvi's share: $2,500*)
• Goal: To explore novel rover designs for asteroid mobility.

2018 *Principal Investigator*, "Bio-inspired ideas for addressing semi-conductor industry needs'
The Kern Family Foundation
• **$12,000** total (*Dr. Marvi's share: $12,000*)
• Goal: To supervise teams of students seeking bio-inspired robotics solutions to address some of the challenging semi-conductor industry needs regarding silicon wafer packaging.

2017 *Principal Investigator*, "Bio-inspired robotics for addressing local industry needs"
The Kern Family Foundation
• **$11,997** total (*Dr. Marvi's share: $11,997*)
• Goal: To seek bio-inspired robotics solutions for addressing some of the challenging industrial needs through student projects.

SELECTED PRESS COVERAGE

University Media

- Full Circle (ASU)
- Office of the GT President
- UA Alumni Magazine
- The Tartan (CMU)
- GT News Room
- CMU News
- GT Alumni Magazine

Scientific Media

- Science Magazine
- Thomson Reuters
- IEEE Spectrum
- Physics Central
- Inside Science
- CNET
- Advanced Science News
- EurekAlert
- Scientific American
- Popular Science
- APS News
- Inside Science TV
- World of Robotics
- Science News
- Christian Science Monitor
- National Geographic
- New Scientist
- Gizmag
- Science Daily

Popular Media

- New York Times
- Reuters
- Daily Mail
- Voice of America
- Smart Planet
- The State Press
- Los Angles Times
- BBC News
- Yahoo News
- Discovery News
- World Daily
- Washington Post
- Sky News
- MSNBC
- Discovery Channel Canada
- The Daily Globe

TEACHING and MENTORING

COURSES TAUGHT

Summary of Teaching:
Undergraduate Courses Taught, including New Course Development: **2**
Graduate Courses Taught, including New Course Development: **2**
Average Teaching Evaluation Score for Undergraduate Courses taught at ASU: **4.38/5.00**
Average Teaching Evaluation Score for Graduate Courses taught at ASU: **4.58/5.00**

At ASU

F'16, F'17, F'18, F'19 — *Instructor*, **"ASU 101-MEE: The ASU Experience,"**

Mechanical Engineering, Arizona State University, Tempe, AZ
• Undergraduate course on skills for academic and professional success, engineering ethics, and an introduction to Mechanical Engineering.
• Enrollment: 21 students in F'16; 18 students in F'17; 19 students in F'18; 20 students in F'19

F'16, F'17, S'18 — *Instructor*, **"MAE 318: System Dynamics and Control,"**

Mechanical and Aerospace Engineering, Arizona State University, Tempe, AZ
• Undergraduate course on feedback control systems; includes laboratory component.
• Enrollment: 98 students in F'16; 41 students in F'17; 60 students in S'18

F'15, F'18, F'19, S'20 — *Instructor*, **"MAE 547: Modeling and Control of Robots,"**

Mechanical and Aerospace Engineering, Arizona State University, Tempe, AZ
• Graduate course on theory and methods applied to the modeling and control of robots.
• Enrollment: 51 students in F'15; 65 students in F'18; 96 students in F'19; 55 students in S'20

S'17 — *Instructor*, **"MAE 598: Bio-inspired Robotics,"**
Mechanical and Aerospace Engineering, Arizona State University, Tempe, AZ
• Graduate course on animal locomotion and robots inspired by nature.
• Enrollment: 24 students

Before ASU

F'14 *Instructor*, **"24676-A (42641-A): Bio-inspired Robotics,"**
Mechanical and Biomedical Engineering, Carnegie Mellon University, Pittsburgh, PA
• Graduate course on animal locomotion and robots inspired by nature.
• Enrollment: 35 students

MENTORING

Summary of Mentoring:

Postdoctoral Associates (Current): **2**
Ph.D. Students Graduated: **3**
Ph.D. Students Current: **2**
M.S. Thesis Students Graduated: **6**
M.S. Thesis Students Current: **4**
M.S. Project Students Graduated: **7**
M.S. Project Students Current: **3**
Undergraduate Students (Research; Total): **39**
HighSchool Students (Research; Total): **3**
Student Fellowships and Awards: **13**
ASU Master's Opportunity for Research in Engineering (MORE) Awards: **9**
ASU Fulton Undergraduate Research Initiative (FURI) Awards: **28**

Note:
Underline indicates individuals currently advised.
* Asterisk indicates individuals funded by a grant on which Prof. Marvi is a PI/Co-PI.

Postdoctoral Associates

F'20 - Pres. Hosain Bagheri*, Arizona State University, Tempe, AZ, Mechanical Engineering
Sum'21 - Pres. Mahdi Ilami*, Arizona State University, Tempe, AZ, Mechanical Engineering

Visiting Scholars

F'19 - Pres. Zhong Huang, Ph.D. Student at Tianjin University, Tianjin, China
F'18 - F'19. Prof. Borhan Beigzadeh, Associate Professor at Iran University of Science and Technology, Tehran, Iran

Ph.D. Students

As Primary Advisor

S'20 - Pres. Olga Skowronek*, Arizona State University, Tempe, AZ, Mechanical Engineering
- ASU Dean's Fellowship (F'18-F'22)
- Honorable Mention, NSF Graduate Research Fellowship Program (S'20)
- Degree expected: F'22

F'18 - Pres. Reza Ahmed*, Arizona State University, Tempe, AZ, Mechanical Engineering
- ARCS Scholarship (F'21-S'22)
- ASU Dean's Fellowship (F'18-F'22)
- Degree expected: F'22

S'16 - Sum'21 Mahdi Ilami, Arizona State University, Tempe, AZ, Mechanical Engineering
- ASU GPSA Outstanding Graduate Research Award (S'20)
- ASU Graduate College Completion Fellowship (F'20-S'21)
- Degree expected: Sum'21
- **Graduated:** Sum'21; Now a Postdoctoral Associate at ASU

S'16 - F'20 Hosain Bagheri, Arizona State University, Tempe, AZ, Mechanical Engineering
- ASU GPSA Travel Award (Sum'17, S'18)
- Thesis: "Bioinspired Interactions with Complex Granular and Aquatic Environments"
- **Graduated:** F'20; Now a Postdoctoral Associate at ASU

Sum'16 - F'19. Andrew Thoesen, Arizona State University, Tempe, AZ, Mechanical Engineering
- Keynote Speaker at TEDx ASU (S'18)
- ASU-NASA SpaceGrant Fellowship (S'18)
- ASU GPSA Travel Award (S'18)
- IEEE ICRA Travel Award (S'18)
- 2nd Place, Simulating Reality Contest by MSC Adams, University Category (S'17)
- ASU GPSA Teaching Award (S'17)
- ASU Best Teaching Assistant Award (S'16)
- Thesis: "Helically Driven Dynamics in Granular Media"
- **Graduated:** F'19; Now at Exponent

SERVICE

Summary of Professional Activities and Service:

Associate Editor for **1** peer-reviewed journal
Guest Editor for **1** peer-reviewed journal
1 International conference committee
6 International and **1** national conference sessions organized/co-organized
7 International and **1** national conference sessions chaired/co-chaired
Member of Editorial Board: **1**
Peer Reviewer for **2** Book Proposals
Peer Reviewer for **21** Journals
Proposal Review Service for **2** Funding Agency
1 ASU-level Committee, **1** Engineering School-level Committee and **2** Program-level Committees
Member of **3** Faculty Search Committees

External Service

2021 - Pres.	*Associate Editor*, Journal of Field Robotics.
2020 - Pres.	*Topic Editor*, Robotics Journal.
2020 - Pres.	*International Advisory Board*, Journal of Advanced Intelligent Systems.
2020 - Pres.	*Guest Editor*, Journal of Advanced Intelligent Systems, Special Issue on Space Robotics.
2019 - Pres.	*Member*, Mechatronics Technical Committee, American Society of Mechanical Engineers.
2018 - Pres.	*Review Editor of the Editorial Board of Soft Robotics*, Journal of Frontiers in Robotics and AI.
Oct. 2020	*Co-organizer and Faculty Chair*, Full day tutorial on "Bio-Inspired Robotics" at IEEE-IROS, Las Vegas, NV.
Sep. 2020	*Technical Committee Member*, The 2nd International Conference on Mechanical Engineering and Vehicle Engineering (MEVE 2020), Nanjing, China.
June 2020	*Co-organizer and Co-chair*, Full day workshop on "Opportunities and Challenges in Space Robotics" at IEEE-ICRA, Paris, France. (Meeting will be held virtually due to COVID-19 outbreak)
2020	*Associate Editor*, 8th IEEE RAS/EMBS International Conference on Biomedical Robotics and Biomechatronics (BioRob 2020), New York, NY.

2019 - 2020	*Guest Editor*, Journal of Advanced Intelligent Systems, Special Issue on Soft Robotics.
May 2019	*Co-organizer and Co-chair*, Full day workshop on "Opportunities and Challenges in Soft Robotics Across Length Scales" at IEEE-ICRA, Montreal, Canada.
Jan. 2019	*Judge*, Elizabeth Adkins-Regan Best Student Poster competition, Society for Integrative and Comparative Biology, Tampa, FL.
Jan. 2019	*Judge*, Student Presentations for the Division of Invertebrate Zoology, Society for Integrative and Comparative Biology, Tampa, FL.
July 2018	*Co-organizer and Chair*, Full day workshop on "Granular Media Modeling and Simulation Techniques" at 13th World Congress on Computational Mechanics, New York City, NY.
Sep. 2017	*Co-organizer and Co-chair*, Full day workshop on "Robotic-inspired Biology" at IEEE-IROS, Vancouver, Canada.
Jan. 2017	*Robot Design Judge*, FIRST Lego League state tournament, Tempe, AZ.
June 2016	*Session Co-chair*, 2nd World Congress on Automation and Robotics, Philadelphia, PA.
May 2016	*Grand Award Judge*, The Intel International Science and Engineering Fair (Intel ISEF), Phoenix, AZ.
May 2015	*Co-organizer and Co-chair*, Full day workshop on "Robotic-inspired Biology" at IEEE-ICRA, Seattle, WA.
July 2014	*Organizer and Chair*, Mini-symposium entitled "The Role of Functional Surfaces on Animal Locomotion" at SIAM Annual Meeting, Chicago, IL.

Book Reviewer

- Cambridge University Press
- Elsevier

Journal Paper Reviewer

- Science Robotics
- Nature Communications
- Nature Scientific Reports
- Advanced Materials
- Advanced Science
- IEEE Transaction on Robotics
- Journal of Soft Robotics
- Robotica
- Bioinspiration and Biomimetics
- Extreme Mechanics Letters
- PLOS ONE
- Beilstein Journal of Nanotechnology
- Journal of the Royal Society Interface
- Advanced Intelligent Systems

- IEEE Robotics and Automation Magazine
- ASME Journal of Mechanisms and Robotics
- Journal of Applied Bionics and Biomechanics
- Journal of Composite Science and Technology
- International Journal of Advanced Robotic Systems
- Journal of Intelligent Material Systems and Structures
- Journal of Geotechnical and Geoenvironmental Engineering

Conference Paper Reviewer

- IEEE International Conference on Intelligent Robots and Systems (IROS)
- IEEE International Conference on Soft Robotics (RoboSoft)
- IEEE International Conference on Robotics and Automation (ICRA)
- ASME Dynamic Systems and Control Conference (DSCC)
- International Conference on Advanced Robotics (ICAR)

Proposal Reviewer

- Army Research Office (ARO), Engineering Sciences Directorate, 2020
- National Science Foundation, Dynamics, Controls and System Diagnostics (DCSD) Panel, 2016 and 2017
- National Science Foundation, National Robotics Initiative (NRI) Panel, 2016

Professional Affiliations

- American Society of Mechanical Engineers (ASME)
- Institute of Electrical and Electronics Engineers (IEEE)
- American Association for the Advancement of Science (AAAS)
- American Physical Society (APS)
- Society for Integrative and Comparative Biology (SICB)

Internal Service

University

S'16 - Pres. *Member*, Education Advisory Council, Biomimicry Center, Arizona State University, Tempe, AZ.

F'19 *Reviewer*, Outstanding Faculty Mentor Awards, Graduate College, Arizona State University, Tempe, AZ.

Ira A. Fulton Schools of Engineering (FSE)

S'19 - Pres. *Investigator*, Drone Studio, Arizona State University, Tempe, AZ.

F'18 - Pres. *Member*, Robotics and Autonomous Systems Faculty Assembly, Arizona State University, Tempe, AZ.

S'20 *Local Arrangements Co-chair*, Southwest Robotics Symposium, Arizona State University, Mesa, AZ. (Meeting cancelled due to COVID-19 outbreak)

Sum'19 *Volunteer*, ASU E2 Camp, Prescott, AZ.

S'19 *Local Arrangements Co-chair*, Southwest Robotics Symposium, (A two-day event with 2 plenary and 13 invited speakers, poster sessions, industry and faculty booths, and lab tours), Arizona State University, Tempe, AZ.

S'18 *Co-organizer and Session Co-chair*, Southwest Robotics Symposium, (A two-day event with 2 plenary and 15 invited speakers, poster sessions, industry booths, and lab tours), Arizona State University, Tempe, AZ.

S'16, S'18 *Organizer*, A half-day event for the National Robotics Week at ASU (invited talks by ASU robotics faculties followed by lab tours open to all of ASU students), Arizona State University, Tempe, AZ.

School for Engineering of Matter, Transport & Energy (SEMTE)

F'15, F'19, F'20 *Member*, Faculty Search Committee, School for Engineering of Matter, Transport and Energy, Arizona State University, Tempe, AZ.

Mechanical and Aerospace Engineering Program

F'18 - Pres. *Member*, Mechanical and Aerospace Engineering (MAE) Undergraduate Affairs Committee, Arizona State University, Tempe, AZ.

F'19 - S'20 *Faculty Advisor*, ASU team for Revolutionary Aerospace Systems Concepts Academic Linkage (RASC-AL) competition managed by National Institute of Aerospace, School for Engineering of Matter, Transport and Energy, Arizona State University, Tempe, AZ.

S'17, S'18, S'21 *Member*, Mechanical and Aerospace Engineering (MAE) Program Assessment Committee, School for Engineering of Matter, Transport and Energy, Arizona State University, Tempe, AZ.

F'16 - S'17 *Faculty Advisor*, ASU Next Level Devils team and student organization for the NASA Micro-g NExT competition. (The team successfully completed the mission with superior performance in the final round, although no official rankings were announced by NASA; We also secured funding from ASU Dean's office, NASA, and Honeywell to support this project), School for Engineering of Matter, Transport and Energy, Arizona State University, Tempe, AZ.