M. Khalid Jawed

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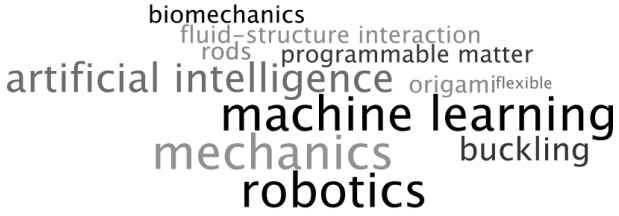

Research Vision

My career goal is a data-driven and artificially intelligent approach to the modeling and design of programmable smart structures. I envision application of machine learning algorithms and an autonomous robotic framework to characterize, enhance, control, and apply the mechanical properties and instabilities of complex materials and metamaterials

Faculty appointment

University of California, Los Angeles, CA — July 2017 - Present
Assistant Professor, Department of Mechanical and Aerospace Engineering
Principal Investigator of Structure-Computer Interaction Laboratory

Education

Massachusetts Institute of Technology, Cambridge, MA
Ph.D. (Mechanical Engineering) — Sep 14 - August 16
Major: Solid and structural mechanics
Minor: Computational engineering

S.M. (Mechanical Engineering) — Jul 12 - Sep 14

University of Michigan, Ann Arbor, MI — Sep 08 - Apr 12
B.S.E. (Aerospace Engineering)
B.S.E. (Engineering Physics)
Minor in Mathematics

Shanghai Jiao Tong University, Shanghai, China — May 09 - Jun 09
Exchange Student

Research Experience

Soft Materials Laboratory, Carnegie Mellon University, Pittsburgh, PA — Sep 16 - July 17
Postdoctoral Fellow
Research area: soft robotics, stretchable electronics, origami, finite element analysis

Elasticity, Geometry and Statistics Laboratory, MIT, Cambridge, MA — Jul 12 - Aug 16
Graduate Research Assistant
Research area: mechanics of elastic rods, computer graphics, fluid-structure interaction, biolocomotion

Solar and Heliospheric Research Group, University of Michigan, Ann Arbor, MI — Sep 09 - Apr 12
Assistant in Research
Research area: physics of solar wind, constrained optimization

Near Infrared Laboratory, University of Michigan, Ann Arbor, MI — Jan 11 - Apr 12
Assistant in Research
Research area: instrumentation for dark energy research

Teaching and Leadership Experience

Department of Mechanical Engineering, MIT, Cambridge, MA — Feb 15 - May 15
Teaching Assistant for 2.002 Mechanics of Materials II
Outstanding TA award
Student evaluation: **6.5/7.0**

University of Michigan Housing, Ann Arbor, MI — Aug 10 - Apr 12
Peer Academic Success Specialist (PASS) at Bursley Residential Hall

Technical Experience

Johnson Controls Henhua Autometal, Shanghai, China — Jul 09 - Aug 09
Engineering Assistant Intern

Journal articles

Peer-Reviewed

J1. **Jawed, M. K.**, Reis, P., "Dynamics of a flexible helical filament rotating in a viscous fluid near a rigid boundary" *Physical Review Fluids*, 2, 034101 (2017)

J2. **Jawed, M. K.**, Reis, P., "Deformation of soft helical rod in low Reynolds number axial flow" *Soft Matter*, 12, 1898 (2016)

J3. **Jawed, M. K.**, Khouri, N., Da, F., Reis, P., "Propulsion and instability of flexible helical rod rotating in viscous fluid" *Physical Review Letters* 115:16, 168101 (2015) **Featured article**

J4. **Jawed, M. K.**, Dieleman, P., Audoly, B., Reis, P., "Untangling the mechanics and topology in the frictional response of long overhand elastic knots" *Physical Review Letters* 115:11, 118302 (2015) **Featured article**

J5. **Jawed, M. K.**, Brun, P. T., Reis, P., "A geometric model for the coiling of an elastic rod deployed onto a moving substrate" *Journal of Applied Mechanics* 82:12, 121007 (2015)

J6. **Jawed, M. K.**, Reis, P., "Pattern morphology in the elastic sewing machine" *Extreme Mechanics Letters* 1, 76-82 (2014)
Inaugural issue of Extreme Mechanics Letters

J7. **Jawed, M. K.**, Da, F., Jungseock, J., Grinspun, E., Reis, P. M., "Coiling of elastic rods on rigid substrates" *Proceedings of the National Academy of Sciences* 111:41, 14663-14668 (2014)

Not Peer-Reviewed

J1. **Jawed, M. K.**, "Geometrically nonlinear configurations in rod-like structures", Doctoral dissertation, Massachusetts Institute of Technology (2016)

J2. **Jawed, M. K.**, "Coiling of elastic rods on rigid substrates", Masters dissertation, Massachusetts Institute of Technology (2014)

Conference Proceedings and Presentations

First and second author only

C1. Majidi, C., **Jawed, M. K.**, Kazem, N., "Soft-matter electronics and multifunctional materials with polydisperse liquid metal suspensions", IEEE AP-S Symposium on Antennas and Propagation and USNC-URSI Radio Science Meeting, San Diego, CA. July 9-14, 2017.

C2. Baek, C., **Jawed, M. K.**, Sageman-Furnas, A., Reis, P., "Form-finding through buckling in elastic gridshells", 53rd Annual Technical Meeting of the Society of Engineering Science, College Park, MD. October 2-5, 2016.

C3. **Jawed, M. K.**, Karimi, H., Reis, P., "Dynamics and propulsion of a rotating flexible helical rod near a no-slip rigid boundary", American Physical Society March Meeting, Baltimore, MD. March 14-18, 2016.

C4. Strong, E., **Jawed, M. K.**, Reis, P., "Fluid-structure interaction of reticulated porous wings", American Physical Society March Meeting, Baltimore, MD. March 14-18, 2016.

C5. **Jawed, M. K.**, Reis, P., "Propulsion of flexible helical flagella near a rigid boundary", Annual Meeting of the American Physical Society Division of Fluid Dynamics, Boston, MA. November 22-24, 2015.

C6. Reis, P., **Jawed, M. K.**, Khouri, N., Da, F., Grinspun, E., "Propulsion and instability of flexible helical flagella", European Solid Mechanics Conference, Madrid, Spain. July 6-10, 2015.

C7. **Jawed, M. K.**, Khouri, N., Da, F., Grinspun, E., Reis, P., "Propulsion and instability of flexible helical flagella", Fluid and Elasticity, Biarritz, France. June 22-24, 2015.

C8. **Jawed, M. K.**, Brun, P.-T., Reis, P., "Coiling of rods from a geometric perspective", American Physical Society March Meeting, San Antonio, TX. March 2-6, 2015.

C9. Reis, P., **Jawed, M. K.**, Dieleman, P., Audoly, B., "Untangling the mechanics versus topology of overhand knots", American Physical Society March Meeting, San Antonio, TX. March 2-6, 2015.

C10. Khouri, N., **Jawed, M. K.**, Da, F., Grinspun, E., Reis, P., "Propulsion and instability of flexible helical flagella", American Physical Society March Meeting, San Antonio, TX. March 2-6, 2015.

C11. Khouri, N., **Jawed, M. K.**, Da, F., Grinspun, E., Reis, P., "The propulsion of filaments with natural curls", New England Workshop on the Mechanics of Materials and Structures, Amherst, MA. October 18, 2014.

C12. **Jawed, M. K.**, Khouri, N., Da, F., Grinspun, E., Reis, P., "The propulsion of filaments with natural curls", 17th US National Congress on Theoretical and Applied Mechanics, East Lansing, MI. June 15-20, 2014.

C13. **Jawed, M. K.**, Da, F., Grinspun, E., Reis, P., "Coiling of rods on moving substrates", American Physical Society March Meeting, Denver, CO. March 3-7, 2014. **Winner of GSNP Student Speaker Award**

C14. Khouri, N., **Jawed, M. K.**, Da, F., Grinspun, E., Reis, P., "The propulsion of filaments with natural curls", American Physical Society March Meeting, Denver, CO. March 3-7, 2014.

C15. Shearer, P., **Jawed, M. K.**, Raines, J. M., Lepri, S. T., Gilbert, J. A., von Steiger, R., Zurbuchen, T. H., "A rigorous statistical approach to determine solar wind composition from ACE/SWICS data, and new Ne/O ratios", American Geophysical Union, San Francisco, CA. December 9-13, 2013.

C16. **Jawed, M. K.**, Da, F., Grinspun, E., Reis, P., "Coiling of thin elastic rods deployed onto moving substrates", New England Workshop on the Mechanics of Materials and Structures, Boston, MA. October 12, 2013.

C17. **Jawed, M. K.**, Da, F., Grinspun, E., Reis, P., "Pattern formation by deposition of a thin elastic rod on a moving substrate", American Physical Society March Meeting, Baltimore, MD. March 18-22, 2013.

Media Coverage (Selected)

M1. Schirber, M., "Buckling in Bacteria Tails", *Physics* (2015) [link]

M2. Cartlidge, E., "Physics may reveal how to tie the perfect knot" *Science* (2015) [link]

M3. Verberck, B., "Knot so simple" *Nature Physics* (2015) [link]

M4. Schirber, M., "Measuring the Forces in a Knot" *Physics* (2015) [link]

M5. Chu, J., "Untangling the mechanics of knots: New model predicts the force required to tie simple knots" *MIT News* (2015) [link] [video]

M6. Selected for MIT's daily-changing homepage image on September 9, 2015 [link]

M7. Ouellette, J., "What's the Best Way to Tie Your Shoes? Physics May Have the Answer" *Gizmodo* (2015) [link]

M8. Byrne, M., "Forget Dark Energy: MIT Physicists Have Finally Cracked Overhand Knots" *Vice* (2015) [link]

M9. Choi, C., "Why some knots work better than others" *Business Insider* (2015) [link]

M10. Larousserie, D., "Un mystère dénoué (A mystery unraveled)" *Le Monde* (2015) [link]

M11. Gast, R., "Was den Knoten stark macht (What makes the knot strong)" *Süeddeutsche Zeitung* (2015) [link]

M12. Chu, J., "Untangling how cables coil: A simulation technology from movies is used to predict coiling patterns in the lab" *MIT News* (2014) [link] [video]

M13. Evarts, H., "How Things Coil" *Columbia Engineering* (2014) [link]

Workshops

W1. Prospective Faculty Workshop, Purdue University, West Lafayette, IN. February 28 - March 1, 2016

W2. Extremely deformable structures, International Center for Mechanical Sciences, Udine, Italy. June 2-6, 2014

W3. Soft solids and complex fluids summer school, University of Massachusetts, Amherst, MA. June 2-6, 2013

Professional Service

Ad hoc reviewer

- *Physical Review Letters*
- *Physical Review Materials*
- *Physical Review Applied*
- *Physical Review E*
- *Physics Letters A*
- *Modelling and Simulation in Materials Science and Engineering*
- *Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences*
- *Journal of Biomechanics*

Professional membership

- American Physical Society

Honors and Awards

Graduate

2015 **Wunsch Foundation Silent Hoist and Crane Award** from MIT Mechanical Engineering for outstanding performance as a teaching assistant in 2.002 Mechanics and Materials II

2015 **Den Hartog Travel Award in Mechanics** of MIT Mechanical Engineering: awarded bi-yearly to a student in the field of Mechanics for participation in a scientific conference

2015 **Luis de Florez Award** (honorable mention) of MIT Mechanical Engineering for outstanding ingenuity and creative judgment in areas that utilize mechanical engineering knowledge or practice

2014 **Best Poster Award** at New England Workshop on the Mechanics of Materials and Structures, Amherst, MA, for the poster "Modeling propulsion of bacterial flagella" (with N. Khouri)

2014 **GSNP Student Speaker Award** for the best contributed talk at the American Physical Society March Meeting, Denver, CO, by a graduate student in the area of Statistical and Nonlinear Physics

Undergraduate

2012 **James B. Angell Scholar** for 8 consecutive terms of all A's record. From the College of Engineering, 2 students received the award. Conferred in March, 2013

2011	**Henry Ford II Distinguished Class Prize**. Presented to one outstanding junior in the College of Engineering who demonstrated academic excellence. In 2011, three students shared the award
2011-13	**Phi Kappa Phi Honor Society** for ranking in top 7.5% of junior and top 10% of senior class
2011-12	**Class of 1935E Scholarship**: A College of Engineering merit award
2010-11	**Charles H. Sayre Scholarship**: A College of Engineering merit award
2010	**SURE** (Summer Undergraduate Research in Engineering) fellowship in **Computer Science and Engineering** (declined). Acceptance rate: 19.5%
2009-10	**William E. Bandemer Scholarship**: A College of Engineering merit award
2009	**Margaret S. Huntington Prize in Actuarial Outreach**: A scholarship program in Department of Mathematics to call attention to careers in actuarial science and mathematics of risk
2009	**IPE Ambassador Travel Grant** for representing College of Engineering in China
2008	**William J. Branstrom Freshman Prize** for ranking in top 5% of freshman class
2008-12	**Dean's List** for above 3.5 GPA with >12 graded credit hours
2008-12	**University Honors** for above 3.5 GPA with >14 credit hours and >12 graded credit hours

Last updated: November 3, 2017