FENG LING

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PERSONAL INFO

Birth Year: 1992
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EDUCATION

2016 - **University of Southern California**, Los Angeles, CA
Ph.D. Candidate, Mechanical Engineering *(Qualifying Exam 05/09/2018)*

2010 - 2015 **The University of Texas at Austin**, Austin, TX
B.S. Pure Mathematics, December 2015
B.S. Aerospace Engineering (Astronautics), December 2015
Computational Science and Engineering Certificate Program, May 2015
Halliburton Business Foundations Summer Institute, July 2012

EMPLOYMENT

2017 - **Research Assistant**, Bio-Inspired Motion Lab at USC, PI: *Prof. Eva Kanso*
2016 **Teaching Assistant**, Engineering Thermodynamics (AME 310), *Prof. J. Domaradzki and A. Penkova*
2013 - 2015 **Research Assistant**, Center for Space Research at UT Austin, PI: *Prof. Srinivas Bettadpur*

PUBLICATIONS

2020
6. F. Ling, Y. Man, and E. Kanso, Proximal-to-distal Molecular Motor Asymmetry Controls Flagellar Wave Reversal, *(in preparation)*
5. J.C. Nawroth, F. Ling, K. Katija, D. Stein, M. Shelley, and E. Kanso, Form and Function of Ciliated Ducts, *(in preparation)*
4. Y. Jiao, F. Ling, S. Heydari, N. Heess, J. Merel, and E. Kanso, Learning to swim in potential flow, *Phys. Rev. Fluids., (under review)*
3. F. Ling and E. Kanso, Octopus-Inspired Arm Movements, *Bioinspired Sensing, Actuation, and Control in Underwater Soft Robotic Systems Ch. 11*

2019
2. Y. Man, F. Ling, and E. Kanso, Cilia Oscillations, *Phil. Trans. R. Soc. B*, *375:20190157*.

2018
1. F. Ling, H. Guo, and E. Kanso, Instability-driven oscillations of elastic microfilaments, *J. R. Soc. Interface 15:20180594*.

RESEARCH INTERESTS/EXPERIENCE

2019 - **Understanding Locomotion via RL**, advised by *Prof. Eva Kanso*, *Dr. Josh Merel* ...
Formation of locomotion gaits and gait transitions in fish and multi-legged animal
Emergence of collective motion and collaboration in ants and fish schools

2017 - **Mechanics of Cilia/Flagella**, supervised by *Prof. Eva Kanso*
Study internal actuation mechanism of eukaryotic cilia oscillation and its biological significance
Using low-order porous media models to analyze ciliary ducts and pumps

2018 - **Trade-offs in Rapid Plant Movements (MSRI-Janelia)**, advised by *Prof. Orit Peleg* and *Dr. Mattia Serra*
Mathematical analysis of drag reduction due to branch folding in *Mimosa Pudica*

2016 - **Discrete Inverse Spectral Problem**, supervised by *Prof. Etienne Vouga* and *Prof. Keenan Crane*
Reconstruction of discrete genus-0 surfaces using only its Laplace-Beltrami spectrum

2013 - 2015 **At Center for Space Research**, supervised by *Prof. Srinivas Bettadpur*
Parametric study of spacecraft accelerometer and center of mass misalignment
Correlation analysis among accelerometer read-outs, thruster firing pattern, and star camera anomalies
Studied geographical significance of GRACE on-board SNR w.r.t. gravity model post-fit residue

TALKS/PRESENTATIONS

2019 - 2020 **APS Division of Fluid Dynamics Meeting**, Proximal-to-distal molecular motor asymmetry controls flagellar wave reversals
SHINE USC (for K12 students), Experiments on the fantastic strangeness of viscosity and elasticity

2018 **APS Division of Fluid Dynamics Meeting**, Ciliary pumps
APS March Meeting, Instability-driven oscillations of active microfilament

2017 **APS Division of Fluid Dynamics Meeting**, Dynamics of active microfilaments
2016 **Mathematics Undergraduate Student Talks** (at UT Austin), LS category and its cousins
2015 **Introduce a Girl to Engineering Day** (w/ demo for kids), Ballon rockets and iterative engineering design
Directed Reading Program, (Co)fiber sequences and $\pi_3(S^2)$, mentor: *Ernest Fontes*
Directed Reading Program, What is persistent homology, mentor: *Ahmad Issa*
2014 **Directed Reading Program**, Čech cohomology of projective spaces, mentor: *Yuecheng Zhu*
Directed Reading Program, Classification of du-val singularities, mentor: *Yuecheng Zhu*
2013 **Directed Reading Program**, How to blow-up double points in a plane, mentor: *Hendrik Orem*

GRADUATE COURSEWORK

at University of Southern California
2020 Physics of Emergent Phenomena, *Prof. Christoph Haselwandter*
Computational Differential Geometry, *Prof. Anand Joshi*
2018 Transition to Chaos in Dynamical Systems, *Prof. Paul Newton*
Mechanics of Locomotion in Air, Water, and on Land, *Prof. Eva Kanso*
2017 Thermodynamics and Statistical Mechanics, *Prof. Christoph Haselwandter*
Incompressible Fluids and Turbulence, *Prof. Mitul Luhar*
2016 Fokas method (audit), *Prof. Athanassios Fokas*
at the University of Texas at Austin
Kac-Moody Algebras and Groups (audit), *Prof. Daniel Allcock*
Algebraic Geometry (audit), *Prof. David Ben-Zvi*
Riemann Surfaces (audit), *Prof. Tim Perutz*
Moduli of Higgs Bundle (audit), *Prof. Andrew Neitzke*
2015 Algebra, *Prof. Felipe Voloch*
K-theory as it appears in geometry, *Prof. Dan Freed*
4-Manifold Topology (audit), *Prof. Robert Gompf*
Rational Homotopy Theory (audit), *Dr. Jonathan Campbell*
Differential Topology, *Prof. Andrew Neitzke*
D-modules (audit), *Dr. Sam Gunningham*
Ergodic Theory and Dynamics (audit), *Prof. Lewis Bowen*
2014 Real Analysis, *Prof. Lewis Bowen*
Algebraic Topology, *Prof. Michael Starbird*
Homotopy Type Theory (audit), *Prof. Andrew Blumberg*
Complex Analysis, *Prof. Thomas Chen*
Stochastic Detection and Estimation, *Prof. Todd Humphreys*
2013 Finite Elements Methods, *Prof. Mary Wheeler*
GPS Signal Processing, *Prof. Todd Humphreys*

HONOR/AWARDS

2015 **Meritorious Winner** Team Lead, COMAP Mathematical Contest In Modeling
Problem B: Searching a lost aeroplane in open water, locally organized by *Dr. Andrew Spann*
2011 **Member**, ΣΓΤ Aerospace Honor Society UT Austin Chapter
2010 **Finalist**, Intel International Science and Engineering Fair

MISC. ASSOCIATIONS

2020 - Yet another climbing fanatic in the making (and can now officially juggle b/c of lockdown)
2019 - Judging for USC Undergraduate Symposium for Scholarly and Creative Work
2018 - 2020 Designated pot washer for Good Karma Cafe at USC (volunteer → part of the family)
2017 USC Wrigley Marine Science Institute Spring Break Program on Sustainability
2016 - 2020 DTLA Weightlifting
2016 Volunteering in SXSW comedy and planning operations crew
2014 - 2016 Participation in Texas Undergraduate Topology and Geometry conference
2013 - 2016 Active member of Math Club at UT Austin (should've bought a shirt to show off)
2011 - 2020 Numerous experiences in MOOC learning on Cryptography, Software Testing, Machine Learning, Database Management, AI, Automata Theory, Epigenetics, Origins of Life...
2011 - 2014 Longhorn Rocket Association (model rockets and software ground station work for a L2 rocket)
2010 - 2011 Member of Engineering for a Sustainable World, Robotics and Automation Society at UT Austin; Explore UT Guide; Austin Habitat for Humanity (helped roofed and fenced a house)
2007 - 2009 Volunteer work at Houston Methodist Hospital and Bellaire City Library