DAISUKE TAKAGI

Department of Mathematics, University of Hawaii at Manoa
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EDUCATION

PhD, Department of Applied Mathematics and Theoretical Physics, University of Cambridge 2007–2010
Advisors: Professors Herbert Huppert and Jim McElwaine

BA and MMath, Peterhouse, University of Cambridge 2003–2007
First Class Honors and Distinction in Part III of the Mathematical Tripos

PROFESSIONAL APPOINTMENTS

JSPS Invitational Fellow, University of Tsukuba, Japan 2025
Visiting Researcher, Gakushuin University, Japan 2024
Visiting Researcher, Okinawa Institute of Science and Technology, Japan 2021
Visiting Lecturer, African Institute of Mathematical Sciences, South Africa 2021
Cooperating Faculty of Mechanical Engineering, University of Hawaii at Manoa (UHM) 2020 – present
Associate Professor of Mathematics, UHM 2018 – present
Affiliate Faculty of Pacific Biosciences Research Center, UHM 2015 – present
Assistant Professor of Mathematics, UHM 2013 – 2018
Associate Research Scientist, New York University 2010 – 2012

GRANTS AND AWARDS

1. NIH Joint DMS/NIGMS Biological and Mathematical Sciences Grant, $591,606 2025–2028
   Role: PI. *Bacterial dispersal and nutrient transport on fungal highways*
2. Excellence in Teaching Award Nomination 2023–2024
   Selected for consideration for a campus wide award at UHM
3. NSF-CMMI Dynamics, Control and Systems Diagnostics Grant, $588,019 2021–2025
   Role: PI. *Collaborative research: actuating and sensing objects on a free surface*
4. ARO Biomathematics Grant, $288,104 2017–2020
   Role: PI. *Transient dynamics of organisms responding to sudden cues*
5. NSF-CBET Fluid Dynamics Grant, $297,941 2016–2020
   Role: PI. *Hydrodynamics of outer flow at low Reynolds numbers for locomotion and flow control*
6. UHM Internal Grant for Microbiome Research, $25,000 2018–2019
   Role: PI. *Investigation of the role of bacterial flagellar positioning on motility in the microenvironments of a natural symbiosis*
7. UHM Internal Grant for Microbiome Research, $25,000 2018–2019
   Role: PI. *Co-invasion leapfrog: modeling the influence of invasive microbial symbionts on aiding the spread of their co-invading hosts*
8. Faculty Teaching Award 2017
   Awarded from the Department of Mathematics at UHM
9. ARO Biomathematics STIR Grant, $47,414 2016–2017
   Role: PI. *Modeling the collective behavior of unsteadily swimming zooplankton*
10. C.L.E. Moore Instructorship (declined) 2010
    Awarded from the Department of Mathematics at Massachusetts Institute of Technology
11. Bateman Postdoctoral Fellowship (declined) 2010
    Awarded from the Department of Geology and Geophysics at Yale University

12. Gates Cambridge Scholarship, $200,000 2007 – 2010
Tuition, allowance, and travel funds from the Bill & Melinda Gates Foundation

13. Geophysical Fluid Dynamics Fellowship, $5,000 2009
Stipend and travel allowance from the Woods Hole Oceanographic Institution

PUBLICATIONS (Supervised students are underlined)

1. Weiss, B., Sun, Y., Lee S., Jung S., Roh C. and Takagi, D. Axisymmetric radiation and decay of gravity-capillary waves. *Phys. Rev. Fluids* (submitted).
2. Hachmeister, J. and Takagi, D.(2025) Computational model of copepods engaged in three modes of feeding. *J. Plankton Res.* fbae062.
3. Chen, Z.Y., Pandey, A., Takagi, D., Jung, S., and Lee, S.(2024) Inertial effects on free surface pumping with an undulating surface. *J. Fluid Mech.* 998, A6.
4. Takagi, D., Balmforth, N.J., Llewellyn Smith, SG (2024) Peristaltic pumping down a porous conduit. *J. Fluid Mech.* 987, A22.
5. Kuball, K., Fernandes, V.F.L., Takagi, D.and Yoshizawa, M. (2024) Blind cavefish evolved higher foraging responses through chemo- and mechanosensing. *Plos one* 19(5), e0300793.
6. Pandey, A., Chen, Z.Y., Yuk, J., Sun, Y., Roh, C., Takagi, D., Lee, S., and Jung, S. (2023) Optimal free-surface pumping by an undulating carpet. *Nat. Commun.* 14, 7735.
7. Chang, I., Lenz, P.H., Hartline, D.K. and Takagi, D. (2022) Larval fish counteract ram and suction to capture evasive prey. *R. Soc. Open Sci.* 9, 220714.
8. Lynch, J.B., James, N., McFall-Ngai, M., Ruby, E.G., Shin, S. and Takagi, D. (2022) Transition to confined spaces impacts bacterial swimming and escape response. *Biophys. J.* 121, 2653–2662.
9. Byron, M.L., Murphy, D.W., Katija, K., Hoover, A.P., Daniels, J., Garayev, K., Takagi, D., Kanso, E., Gemmell, B.J., Ruszczyk, M. and Santhanakrishnan, A. (2021) Metachronal motion across scales: current challenges and future directions. *Integrative and Comparative Biology*, 1–15.
10. Tomiyama, J. M., Takagi, D.and Kantar, M. B. (2020) The effect of acute and chronic food shortage on human population equilibrium in a subsistence setting. *Agriculture & Food Security* 9, 1–12.
11. Joo, S., Jung, S. Lee, S., Cowie, R. H. and Takagi, D. (2020) Freshwater snail feeding: lubrication-based particle collection on a free surface. *J. R. Soc. Interface* 17, 20200139.
12. Niimoto, K., Kuball, K. J., Block, L. N., Lenz, P. H. and Takagi, D. (2020). Rotational maneuvers of copepod nauplii at low Reynolds number. *Fluids* 5(2), 78.
13. Takagi, D. and Strickler, J. R. (2020) Active hydrodynamic imaging of a rigid spherical particle. *Sci. Rep.* 10, 2665.
14. Hayashi, R. and Takagi, D. (2020) Metachronal swimming with rigid arms near boundaries. *Fluids* 5(1), 24.
15. Tuttle, L. J., Robinson, H. E., Takagi, D., Strickler, J. R., Lenz, P. H. and Hartline, D. K. (2019) Going with the flow: Hydrodynamic cues trigger directed escapes from a stalking predator. *J. R. Soc. Interface* 16, 20180776.
16. Krasky, D. and Takagi, D. (2018) Diffusion of swimmers jumping stochastically between multiple velocities. *J. Stat. Mech. Theory Exp.* 10, 103201.
17. Bonnard, B., Chyba, M., Rouot, J., and Takagi, D. (2018). Sub-Riemannian geometry, Hamiltonian dynamics, micro-swimmers, copepod nauplii and copepod robot. *Pacific Journal of Mathematics for Industry* 10(1), 2.

18. Hynson, N. A., Frank, K. L., Alegado, R. A., Amend, A. S., Arif, M., Bennett, G. M. Jani, A. J., Medeiros, M. C. I., Mileyko, Y., Nelson, C. E., Nguyen, N. H., Nigro, O. D., Prisic, S., Shin, S., Takagi, D., Wilson, S. T. and Yew, J. Y. (2018) Synergy among microbiota and their hosts: Leveraging the Hawaiian archipelago and local collaborative networks to address pressing questions in microbiome research, *MSystems* 3(2), e00159-17.

19. Takagi, D. and Hartline, D. K. (2018) Directional hydrodynamic sensing by free-swimming organisms, *Bull. Math. Biol.* 80, 215–227.

20. Hayashi, R. and Takagi, D. (2017) Asynchronous oscillations of rigid rods drive viscous fluid to swirl, *Phys. Rev. Fluids* 2(12), 124101.

21. Chyba, M., Takagi, D., Kravchenko, Y. and Markovichenko, O. (2017) Analysis of efficient strokes for multi-legged microswimmers, *Proc. IEEE Conf. Control Tech. App.*

22. Bonnard, B., Chyba, M., Rouot, J. and Takagi, D. (2016) A numerical approach to the optimal control and efficiency of the copepod swimmer, *Proc. 55th IEEE Conf. Dec. Contr.*

23. Cardiel, J. J., Takagi, D., Tsai, H. and Shen, A. Q. (2016) Formation and flow behavior of micellar membranes in a T-shaped microchannel, *Soft Matter*, 12, 8226–8234.

24. Lenz, P. H., Takagi, D. and Hartline, D. K. (2015) Choreographed swimming of copepod nauplii, *J. Roy. Soc. Interface* 12, 20150776.

25. Takagi, D. (2015) Swimming with stiff legs at low Reynolds number, *Phys. Rev. E*, 92, 023020.

26. ten Hagen, B., Wittkowski, R., Takagi, D., Kümmel, F., Bechinger, C. and Löwen, H. (2015) Can the self-propulsion of anisotropic microswimmers be described by using forces and torques?, *J. Phys. Condens. Matter*, 27, 194110.

27. ten Hagen, B., Kümmel, F., Wittkowski, R., Takagi, D., Löwen, H. and Bechinger, C. (2014) Gravitaxis of asymmetric self-propelled colloidal particles, *Nat. Commun.*, 5, 4829.

28. Kümmel, F., ten Hagen, B., Wittkowski, R., Takagi, D., Buttinoni, I., Eichhorn, R., Volpe, G., Löwen, H. and Bechinger, C. (2014) Reply to "Comment on 'Circular motion of asymmetric self-propelling particles' ", *Phys. Rev. Lett.*, 113, 029802.

29. Takagi, D., Palacci, J., Braunschweig, A.B., Shelley, M.J. Zhang, J. (2014) Hydrodynamic capture of microswimmers into sphere-bound orbits, *Soft Matter* 10, 1784–1789.

30. Takagi, D., Braunschweig, A.B., Zhang, J. and Shelley, M.J. (2013) Dispersion of self-propelled rods undergoing fluctuation-driven flips, *Phys. Rev. Lett.*, 110, 038301.

31. McElwaine, J.N., Takagi, D. and Huppert, H.E. (2012) Surface curvature of steady granular flows, *Granul. Matter*, 14, 229-234.

32. McElwaine, J.N., Takagi, D. and Huppert, H.E. (2012) Steady channels and avalanches of dense granular flow down a slope, *Proc. ICTAM.*

33. Takagi, D. and Huppert, H.E. (2011) Pouring viscous fluid out of a tipped container in minimal time, *Phys. Rev. E*, 84, 035303(R).

34. Takagi, D., McElwaine, J.N. and Huppert, H.E. (2011) Shallow granular flows, *Phys. Rev. E*, 83, 031306.

35. Takagi, D. and Balmforth, N.J.(2011) Peristaltic pumping of rigid objects in an elastic tube, *J. Fluid Mech.*, 672, 219-244.

36. Takagi, D. and Balmforth, N.J. (2011) Peristaltic pumping of viscous fluid in an elastic tube, *J. Fluid Mech.*, 672, 196-218.

37. Takagi, D. and Huppert, H.E. (2010) Initial advance of long lava flows in open channels, *J. Volcanol. Geotherm. Res.*, 195, 121-126.

38. Takagi, D. and Huppert, H.E. (2010) Flow and instability of thin films on a cylinder and sphere, *J. Fluid Mech.*, 647, 221-238.

39. Takagi, D.(2009) Nonlinear peristaltic waves: a bitter pill to swallow, *Proc. GFD WHOI.*

40. Takagi, D. and Huppert, H.E. (2008) Expanding volumes of channelized viscous gravity currents, *Proc. ICTAM.*
41. Takagi, D. and Huppert, H.E. (2008) Viscous gravity currents inside confining channels and fractures, *Phys. Fluids*, 20(2), 023104.
42. Takagi, D. and Huppert, H.E. (2007) The effect of confining boundaries on viscous gravity currents, *J. Fluid Mech.*, 577, 495-505.

INVITED TALKS

1. (2025) Snail-inspired pumping along fluid-fluid interface, *University of British Columbia*, Vancouver, Canada.
2. (2025) Robotic design inspired by microscopic organisms, *Chuo University*, Tokyo, Japan.
3. (2025) Plenary talk of the ToKYo Molecular Motor Show, *Gakushuin University*, Tokyo, Japan.
4. (2024) Environmental engineering inspired by bacteria and snails, *University of Tsukuba*, Tsukuba, Japan.
5. (2024) Environmental engineering inspired by bacteria and snails, *Tohoku University*, Sendai, Japan.
6. (2024) Dynamics of aquatic organisms in physically constrained environments, *California Institute of Technology*, Pasadena, CA.
7. (2024) Dynamics of aquatic organisms in physically constrained environments, *Okinawa Institute of Science and Technology*, Okinawa, Japan.
8. (2023) Microscopic life navigating with smart escapes, *University of Toronto*, Toronto, Canada.
9. (2023) Larval fish counteract ram and suction to capture evasive prey, *Society for Mathematical Biology Annual Meeting's Minisymposium*, Columbus OH.
10. (2023) Microscopic life navigating with smart escapes, *Institute of Science and Technology Austria*, Vienna, Austria.
11. (2021) Predator-prey interactions mediated by flow sensing, *Biofluids Symposium*, Kyoto, Japan.
12. (2021) Predator-prey interactions mediated by flow sensing, *Okinawa Institute of Science and Technology*, Okinawa, Japan.
13. (2021) Acrobatic maneuvers of larval copepods, *Society for Integrative and Comparative Biology Annual Meeting*, Washington DC.
14. (2019) Flow sensing in predator-prey Interactions, Thompson Hall Science & Mathematics Seminar, *University of Puget Sound*, Tacoma, WA.
15. (2019) Modeling and experimenting with plankton-inspired robots, Society for Advancement of Chicanos/Hispanics and Native Americans in Science Conference, Honolulu, HI.
16. (2019) Flow Sensing in Predator-Prey Interactions, Mechanical Engineering Seminar, *University of Hawaii at Manoa*, Honolulu, HI.
17. (2019) Flow Sensing in Predator-Prey Interactions, NSF Workshop on Mathematical Fluids, Material and Biology, *Universith of Michigan*, Ann Arbor, MI.
18. (2019) Flow Sensing in Predator-Prey Interactions, Cornell Fluids Seminar, *Cornell University*, Ithaca, NY.
19. (2019) Plankton-inspired design of miniature robots, Biological and Environmental Engineering Research Seminar, *Cornell University*, Ithaca, NY.
20. (2018) Predator-prey interactions from the perspective of zooplankton, ISMER Seminar, *University of Quebec at Rimouski*, Rimouski, Canada.
21. (2017) Plankton-inspired robotics: modeling and experiments, Civil Engineering Seminar, *University of Hawaii at Manoa*, Honolulu, HI.

22. (2017) Hydrodynamic reception and predator avoidance in free-swimming organisms, Pacific Biosciences Research Center Seminar, *University of Hawaii at Manoa*, Honolulu, HI.
23. (2016) Hydrodynamics of copepod locomotion, feeding, and sensing, Workshop on New Aspects of Micro- and Macroscopic Flows in Soft Matters, *Okinawa Institute of Science and Technology*, Okinawa, Japan.
24. (2015) Soft matter physics of microscopic swimmers, Physics Department Colloquia, *University of Hawaii at Manoa*, Honolulu, HI.
25. (2015) Modeling lava flows in the lab: simplified theory and experiments, Geophysical Fluid Dynamics Institute Colloquium, *Florida State University*, Tallahassee, FL.
26. (2015) Microscale flow controlled by swimming larval copepods, Symposium on Small Meets Large: Connecting Microfluidics with Marine Ecology, *Okinawa Institute of Science and Technology*, Okinawa, Japan.
27. (2015) How synthetic microswimmers move, turn, flip, and spread, Mathematical Soft Matter Unit Seminar, *Okinawa Institute of Science and Technology*, Okinawa, Japan.
28. (2013) How synthetic microswimmers move, turn, flip, and spread, Conference on Frontiers in Applied and Computational Math, *New Jersey Institute of Technology*, Newark, NJ.
29. (2013) How synthetic microswimmers move, turn, flip, and spread, Biomechanics Seminar, Mechanical and Aerospace Engineering, *University of California San Diego*, San Diego, CA.
30. (2013) Engineering smart materials and devices using microscopic swimmers, College of Engineering, *University of Hawaii at Manoa*, Honolulu, HI.
31. (2013) Modeling lava flows in the lab: simplified theory and experiments, Department of Geology & Geophysics, *University of Hawaii at Manoa*, Honolulu, HI.
32. (2013) Dispersion of microscopic swimmers in biological and synthetic systems, Mathematical Biology Seminar, *University of Hawaii at Manoa*, Honolulu, HI.
33. (2012) How synthetic microswimmers move, turn, flip, and spread, Department of Geology & Geophysics, *Yale University*, New Haven, CT.
34. (2012) How synthetic microswimmers move, turn, flip, and spread, Applied Mathematics Colloquium, *University of North Carolina at Chapel Hill*, Chapel Hill, NC.
35. (2012) How synthetic microswimmers move, turn, flip, and spread, Mathematical Sciences Seminar, *Montclair State University*, Montclair, NJ.
36. (2012) Mathematical Modeling of nanoscale motors and motile microorganisms, Department of Mathematics Colloquium, *University of Hawaii at Manoa*, Honolulu, HI.
37. (2012) Dispersion of active nanorods turning and flipping spontaneously, NYU-Tulane Focused Research Group Workshop, *New York University*, New York, NY.
38. (2010) Nonlinear peristaltic waves: feeding the hungry python, Physical Mathematics Seminar, *Massachusetts Institute of Technology*, Boston, MA.
39. (2009) Viscous gravity currents, Fluid Mechanics Seminar, *University of Cambridge*, Cambridge, UK.

CONTRIBUTED TALKS (Supervised students are underlined)

1. Weiss, B., Sun, Y., Lee S., Jung S., Roh C. and Takagi, D. Viscous decay of gravity-capillary waves around an oscillating body, *APS 78th Annual Meeting of the Division of Fluid dynamics*, Houston, TX.
2. Lee, S., Pandey, A., Chen, Z., Roh, C., Takagi, D.and Jung, S. (2024) Free surface pumping via an undulating carpet, *APS March Meeting*, Minneapolis, MN.
3. Takagi, D.(2024) Predator-prey interactions mediated by hydrodynamic cues, *Microscale Ocean Biophysics 7.0 Conference*, Heron Island, Australia.

4. Weiss, B.P., Sun, Y., Roh, C., Lee, S., Sunghwan, J. and Takagi, D. (2023) Axisymmetric radiation and decay of gravity-capillary waves, *APS 76th Annual Meeting of the Division of Fluid Dynamics*, Washington, DC.
5. Weiss, B.P., Sun, Y., Ji, C., Roh, C. and Takagi, D. (2022) Echolocation through gravity-capillary waves, *APS 75th Annual Meeting of the Division of Fluid Dynamics*, Indianapolis, IN.
6. Chen, Z., Pandey, A., Takagi, D., Jung, S. and Lee, S. (2022) Snail feeding: Thin film flow with an undulating surface, *APS 75th Annual Meeting of the Division of Fluid Dynamics*, Indianapolis, IN.
7. Lynch, J.B., James, N., McFall-Ngai, M., Ruby, E.G., Shin, S. and Takagi, D. (2022) Transition to confined spaces impacts bacterial swimming and escape response, *APS 75th Annual Meeting of the Division of Fluid Dynamics*, Indianapolis, IN.
8. Pandey, A., Yuk, J., Sun, Y., Sequeira, Y., Roh, C., Lee, S., Takagi, D. and Jung, S. (2021) Interfacial pumping inspired by snails, *APS 74th Annual Meeting of the Division of Fluid Dynamics*, Phoenix, AZ.
9. Hayashi, R. and Takagi, D.(2021) Pumping and swimming robots in a highly viscous fluid, *Society for Mathematical Biology Annual Meeting*, Washington DC.
10. Takagi, D.and Strickler, J. R. (2020) Mechanical sensing of particles enhanced by controlled agitation, *Ocean Sciences Meeting*, San Diego, CA.
11. Chang, I., Lenz, P.H., Hartline, D.K. and Takagi, D.(2020) Larval fish feeding: strategies for capturing prey, *Ocean Sciences Meeting*, San Diego, CA.
12. Takagi, D. , Joo, S., Cowie, R., Lee, S. and Jung, S. (2019) Snail feeding at the air-water interface, *APS 72nd Annual Meeting of the Division of Fluid Dynamics*, Seattle, WA.
13. Hachmeister, J. and Takagi, D. (2019) Non-axisymmetric flow and sensing around copepods, *APS 72nd Annual Meeting of the Division of Fluid Dynamics*, Seattle, WA.
14. Krasky, D. and Takagi, D.(2019) Diffusion of multi-speed gear-shifting Brownian swimmers, *APS 72nd Annual Meeting of the Division of Fluid Dynamics*, Seattle, WA.
15. Takagi, D.and Strickler, J. R. (2019) Analytical model for sensing particles in unsteady flow, *International Congress on Industrial and Applied Mathematics*, Valencia, Spain.
16. Krasky, D. and Takagi, D.(2019) Diffusion of multi-speed gear-shifting Brownian swimmers, *APS March Meeting*, Boston, MA.
17. Takagi, D. and Strickler, J. R. (2019) Active sensing of particles suspended in unsteady flow, *APS March Meeting*, Boston, MA.
18. Takagi, D. and Strickler, J. R. (2018) Flow-based echolocation of silent prey, *APS 71st Annual Meeting of the Division of Fluid Dynamics*, Atlanta, GA.
19. Hayashi, R. and Takagi, D.(2018) Pumping, mixing, and swimming with oscillating arms, *APS 71st Annual Meeting of the Division of Fluid Dynamics*, Atlanta, GA.
20. Jung, S., Joo, S., Takagi, D., Lee, S. and Cowie, R. (2018) How snails collect food with a funnel-shaped foot, *18th US National Congress for Theoretical and Applied Mechanics*, Chicago, IL.
21. Takagi, D. and Hartline, D. K. (2018) Mechanics of copepod hair sensors and predator detection, *18th US National Congress for Theoretical and Applied Mechanics*, Chicago, IL.
22. Takagi, D. and Hartline, D. K. (2018) Sensing Hydrodynamic Cues and Escaping from Predators: Theoretical Strategies for Swimming Organisms and Robots, *Society for Integrative & Comparative Biology Annual Meeting*, San Francisco, CA.
23. Takagi, D. and Hartline, D. K. (2017) Hydrodynamic sensing and predator localization by free-swimming organisms, *Society for Mathematical Biology Annual Meeting*, Salt Lake City, UT.
24. Takagi, D. and Hartline, D. K. (2016) Predator localization by sensory hairs in free-swimming arthropods, *APS 69th Annual Meeting of the Division of Fluid Dynamics*, Portland, OR.

25. Takagi, D., Cardiel, J. J., Tsai, H. and Shen, A. Q. (2016) Instability of a micellar membrane in a T-shaped microchannel, *XVII International Congress on Rheology*, Kyoto, Japan.
26. Takagi, D. and Hayashi, R. (2015) Bio-inspired robotic legs drive viscous recirculating flows, *APS 68th Annual Meeting of the Division of Fluid Dynamics*, Boston, MA.
27. Takagi, D., Lenz, P.H. and Hartline, D.K. (2015) Adaptations to microscale flow: modeling copepod naupliar locomotion, *Microscale Ocean Biophysics Meeting*, Aspen, CO.
28. Takagi, D. (2015) Shrimp theorem: Paddle swimming at low Reynolds number, *APS 67th Annual Meeting of the Division of Fluid Dynamics*, San Francisco, CA.
29. Takagi, D., Palacci, J., Braunschweig, A.B., Shelley, M.J. and Zhang, J. (2014) Capturing stealthy microswimmers, *GKB Laboratory 50th Anniversary Symposium*, Cambridge, UK.
30. Takagi, D., Palacci, J., Braunschweig, A.B., Shelley, M.J. and Zhang, J. (2013) Capturing stealthy microswimmers into sphere-bound orbits, *APS 66th Annual Meeting of the Division of Fluid Dynamics*, Pittsburgh, PA.
31. Takagi, D., Palacci, J., Braunschweig, A.B., Shelley, M.J. and Zhang, J. (2013) How synthetic microswimmers move, turn, flip, and spread, *XXV IUPAP International Conference on Statistical Physics*, Seoul, Korea.
32. Takagi, D., Braunschweig, A.B., Zhang, J. and Shelley, M.J. (2012) How synthetic microswimmers move, turn, flip, and spread, *APS 65th Annual Meeting of the Division of Fluid Dynamics*, San Diego, CA.
33. Huppert, H.E., McElwaine, J.N. and Takagi, D. (2012) Steady channels and avalanches of dense granular flow down a slope, *XXIII International Congress of Theoretical and Applied Mechanics*, Beijing, China.
34. Takagi, D., Braunschweig, A.B., Zhang, J. and Shelley, M.J. (2012) How catalytic nanomotors actively move, turn, flip, and spread, *Institute of Physics Meeting on Swimming and Complexity at low Reynolds Number*, London, UK.
35. Takagi, D. and Balmforth, N.J. (2010) Peristaltic pumping in an elastic tube: feeding the hungry python, *APS 63rd Annual Meeting of the Division of Fluid Dynamics*, Long Beach, CA.
36. Takagi, D., McElwaine, J.N. and Huppert, H.E. (2009) Granular flows on unconfined slopes, *IMA Conf. on Dense Granular Flows*, Cambridge, UK.
37. Takagi, D. and Huppert, H.E. (2008) The evolution of viscous flow on a cylinder, *APS 61st Annual Meeting of the Division of Fluid Dynamics*, San Antonio, TX.
38. Takagi, D. and Huppert, H.E. (2008) Expanding volumes of channelized viscous gravity currents, *XXII International Congress of Theoretical and Applied Mechanics*, Adelaide, Australia.
39. Takagi, D., McElwaine, J.N. and Huppert, H.E. (2008) Granular flows on unconfined slopes, *European Postgraduate Fluid Dynamics Conference*, Keele, UK.
40. Takagi, D., McElwaine, J.N. and Huppert, H.E. (2008) Dense granular flows on an unconfined slope, *Gordon Research Conference on Granular and Granular-Fluid Flows*, Waterville, ME.
41. Takagi, D. and Huppert, H.E. (2007) Theoretical model for lava flows in confining channels, *American Geophysical Union Fall Meeting*, San Francisco, CA.
42. Takagi, D. and Huppert, H.E. (2006) The effect of confining boundaries on viscous gravity currents, *APS 59th Annual Meeting of the Division of Fluid Dynamics*, Tampa, FL.

TEACHING

Visiting Lecturer, African Institute for Mathematical Sciences, South Africa 2021
Biophysics at the Microscale (graduate course delivered remotely)

Instructor, University of Hawaii at Manoa 2013 – present

MATH 602 Methods of Applied Mathematics	Fall 2025
MATH 305 Mathematical Modeling: Stochastic Models	Fall 2025
MATH 305L Mathematical Modeling: Stochastic Models Lab	Fall 2025
MATH 602 Methods of Applied Mathematics	Spring 2025
MATH 603 Ordinary and Partial Differential Equations	Fall 2024
MATH 372 Elementary Probability and Statistics	Fall 2024
MATH 244 Calculus IV	Spring 2024
MATH 372 Elementary Probability and Statistics	Spring 2024
MATH 215 Applied Calculus I	Fall 2023
MATH 649K Advanced Continuum Mechanics	Spring 2023
MATH 304 Mathematical Modeling: Deterministic Models	Spring 2023
MATH 304L Mathematical Modeling: Deterministic Models Lab	Spring 2023
MATH 215 Applied Calculus I	Fall 2022
MATH 305 Mathematical Modeling: Stochastic Models	Spring 2022
MATH 305L Mathematical Modeling: Stochastic Models Lab	Spring 2022
MATH 402 Partial Differential Equations	Fall 2021
MATH 215 Applied Calculus I	Fall 2021
MATH 305 Mathematical Modeling: Stochastic Models	Spring 2020
MATH 305L Mathematical Modeling: Stochastic Models Lab	Spring 2020
MATH 100 Survey of Mathematics	Fall 2019
MATH 304 Mathematical Modeling: Deterministic Models	Fall 2019
MATH 304L Mathematical Modeling: Deterministic Models Lab	Fall 2019
MATH 407 Numerical Analysis	Spring 2019
MATH 305 Mathematical Modeling: Stochastic Models	Spring 2019
MATH 305L Mathematical Modeling: Stochastic Models Lab	Spring 2019
MATH 304 Mathematical Modeling: Deterministic Models	Fall 2018
MATH 304L Mathematical Modeling: Deterministic Models Lab	Fall 2018
MATH 601 Applied Dynamical Systems	Spring 2018
MATH 307 Linear Algebra and Differential Equations	Fall 2017
MATH 241 Calculus I	Fall 2017
MATH 407 Numerical Analysis	Spring 2017
MATH 649K Applied Stochastic Processes	Fall 2016
MATH 304 Deterministic Models	Fall 2016
MATH 480 Senior Seminar	Spring 2016
MATH 216 Applied Calculus II	Spring 2016
MATH 402 Partial Differential Equations	Fall 2015
MATH 215 Applied Calculus I	Fall 2015
MATH 307 Linear Algebra and Differential Equations	Spring 2015
MATH 216 Applied Calculus II	Spring 2015
MATH 311 Linear Algebra	Fall 2014
MATH 215 Applied Calculus I	Fall 2014
MATH 649K Understanding Fluid Flow	Spring 2014
MATH 307 Linear Algebra and Differential Equations	Fall 2013
MATH 244 Calculus IV	Spring 2013

Co-Instructor, New York University 2011

MATH – UA 262 Ordinary Differential Equations	Fall 2011

Supervisor, University of Cambridge 2007 – 2009
Part II Waves Spring 2009
Part II Fluid Dynamics Fall 2008
Part IB Fluid Dynamics Spring 2008
Part IA Differential Equations Fall 2007

RESEARCH ADVISEES

Postdoctoral Scholars

B. Leathers, Mathematics 2025–present
G. Martin, Microbial Ecology (Co-advised with N. Nguyen at UHM) 2023–present
A. Pandey, Environmental Engineering (Co-advised with S. Jung at Cornell) 2019–2022
J.B. Lynch, Microbiology (Co-advised with M. McFall-Ngai at UHM) 2018–2020
C. Egan, Ecology (Co-advised with N. Hynson at UHM) 2018–2019
L.J. Tuttle, Ecology (Co-advised with P.H. Lenz and D.K. Hartline at UHM) 2017–2019

Graduate Students

M. Aschenbrenner, PhD Mathematics, UHM 2024–present
W. Minoda, MA Environmental Sciences (Co-advised with Y. Yawata at U. Tsukuba) 2024–present
Y. Sun, PhD Environmental Engineering (Co-advised with C. Roh at Cornell) 2022–present
Z. Chen, PhD Mechanical Engineering (Co-advised with S. Lee at U. Minnesota) 2021–2024
V. Chung, MA Mathematics, UHM 2019–2020
R. Hayashi, PhD Mechanical Engineering, UHM 2017–2024
J. Hachmeister, PhD Mathematics, UHM 2016–2022
D. Krasky, PhD Mathematics, UHM 2016–2019
D. Devine, MA Mathematics, UHM 2015–2016

Undergraduate Students at UHM

W. Gao, Microbiology 2024
C. Nguyen, Mathematics 2023
B. Weiss, Physics 2022
A. Wu, Biology 2019
K. Kuball, Biology 2018
I. Chang, Biology 2018
C. Eblen, Mathematics 2017
K. Niimoto, Bioengineering 2017
S. Joo, Mathematics 2017
J. Tomiyama, Mathematics 2017
D. Joo, Microbiology 2015
N. Kanekuni, Computer Science 2015
K. Nowak, Mathematics 2015
H. Larner, Mechanical Engineering 2015
K. Elliot, Mathematics 2014
S. Kaneshiro, Mechanical Engineering 2014
C. King, Electrical Engineering 2014
L. King, Electrical Engineering 2014
D. Bishon, Geology & Geophysics 2013

SERVICE

Lead Organizer, Workshop at Banff International Research Station, Canada 2023–2025
Led a 5-day workshop on particulates across scales: mathematical modeling, computation, and applications. The workshop was held in July 2025 and brought together a diverse group of experimentalists and mathematical modelers.

Co-Lead Organizer, Workshop at Microscale Ocean Biophysics Meeting, Australia 2024
Served as co-lead of a 1-day workshop on computational modeling for multiscale fluid flows. The workshop was part of the Microscale Ocean Biophysics Conference in June 2024 and included a hands-on coding session.

Member of Undergraduate Research Opportunities Council (UROC), UHM 2021–present
Served on the faculty advisory board for promoting undergraduate research across campus. Reviewed student funding applications for the College of Engineering, College of Natural Sciences, and School of Ocean and Earth Science and Technology.

Director of Experimental Laboratory in Mathematics, UHM 2014–present
Founded a wet laboratory to promote research and education in mathematical modeling with experiments. Recruited graduate students and undergraduates from diverse disciplines to pursue projects in a collaborative environment.

Participant of Outreach Events in Hawaii 2014–present
Contributed to outreach events including STOMP's Robotics Camp, Molokai Math Day, Manoa Experience, Reach for the Stars, and Atherton YMCA STEM Career Night. Served as panelist of a panel discussion on interdisciplinary research at the CTAHR conference held on Manoa campus in 2024.

Member of Departmental Committees, UHM 2013–present
Chaired the temporary assistant professor (TAP) hiring committee (2023–2024) and the Data, Stats Bio committee (2024–present). Served on numerous other committees over the years, including the assessment, curriculum, graduate, hiring, mathematical biology, policy, teaching award and tutor committees.

Examiner of PhD and MA Dissertations 2013–present
Served on doctoral and master's dissertation committees for mathematics and mechanical engineering departments at UHM. Served as University Rep. of dissertation committees for biology, geophysics, and linguistics at UHM. Served as external examiner of a PhD oral examination in mathematics at the University of Toronto.

Reviewer of Journals and Grant Proposals 2011–present
Reviewed manuscripts for numerous scientific journals, including the Journal of Fluid Mechanics, Physical Review Letters, and Nature Communications. Reviewed grant proposals for the National Science Foundation, Human Frontier Science Program Organization, and the European Research Council.