ARIANA MENDIBLE

University of Washington ⋄ Mechanical Engineering Bldg 120, Box # 352600 ⋄ Seattle WA 98195

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Research Interests

Dynamical systems, modal decompositions, reduced-order modeling, transport-dominated phenomenon, traveling wave physics, machine learning

EDUCATION

University of Washington — June 2021 (expected)

PhD, Mechanical Engineering — *GPA: 3.91*

· Advisors Steven Brunton (Mechanical Engineering) and J. Nathan Kutz (Applied Mathematics)
· Research in data-driven dimensionality reduction methods for traveling waves using optimization
· Courses in scientific computing, partial differential equations, optimization, system dynamics, software development, and data visualization

Seattle University — June 2016

BS, Mechanical Engineering, Minor in Mathematics — *Seattle, WA*

· Senior Design project prototyping a pneumatic tool accessory for Ingersoll Rand, resulting in patent application
· Conducted research in numerical solutions to the nonlinear water wave equations with dissipation, advised by John Carter (Mathematics), supported by Clare Boothe Luce Foundation Undergraduate Research Award

RELEVANT EXPERIENCE

Clear Motion (formerly Levant Power) — June - Aug 2016

Controls Engineering Intern — *Woburn, MA*

· Worked with the Controls Team to develop Simulink controllers for novel actively-controlled vehicle damper system
· Developed MATLAB codes to streamline experimental test setup and daily tasks for Controls Team

Senior Design Project — Sept 2015 - June 2016

Ingersoll Rand & Seattle University — *Seattle, WA*

· Developed a working prototype digital flow hour meter for high pressure pneumatic tool applications
· USPTO Patent application filed through Ingersoll Rand (US20190051059A1 (Pending))

National Renewable Energy Laboratory — June - Aug 2015

Science Undergraduate Laboratory Internship — *Boulder, CO*

· Developed two wave prediction methods in MATLAB for improving wave energy converter controls in collaboration with the Water Power Team
· Communicated results on the validity of the two models in technical paper and poster at SULI conference

Oregon State University — June - Aug 2014

OH Hinsdale Wave Research Laboratory REU — *Corvallis, OR*

· Worked in the Tsunami Wave Basin to study the interaction between marine infrastructure and tsunamis
· Applied flow visualization toolboxes in MATLAB to quantify tsunami-induced vortices
· Communicated results in a technical paper and poster presentation at the NEES REU Symposium

PUBLICATIONS AND PATENTS

- **A Mendible**, J Koch, H Lange, SL Brunton, JN Kutz. *Data-driven modeling of rotating detonation waves* (2020). Submitted to Physical Review Fluids.

- **A Mendible**, SL Brunton, AY Aravkin, W Lowrie, JN Kutz. *Dimensionality reduction and reduced-order modeling for traveling wave physics* (2020). Theoretical and Computational Fluid Dynamics 34 (4), 385-400.

- NB Erichson, **A Mendible**, S Wihlborn, JN Kutz. *Randomized nonnegative matrix factorization* (2018). Pattern Recognition Letters, 104, 1-7.

- **A Mendible**, S Heard, T Tran, A Hardesty. *Air Flow Hour Meter.* US20190051059A1 (Pending)

MEETINGS AND TALKS

- **A Mendible**, J Koch, H Lange, SL Brunton, JN Kutz *Data-driven Modeling of Shock Waves in Rotating Detonation Engines.* SIAM Computer Science and Engineering, Mar 2021, (invited).

- **A Mendible**, J Koch, H Lange, SL Brunton, JN Kutz *Data-driven Modeling of Detonation Wave Interactions in Rotating Detonation Engines.* 73rd Annual Meeting of the APS Division of Fluid Dynamics, Nov 2020 (planned).

- **A Mendible**, A Aravkin, W Lowrie, JN Kutz and SL Brunton. *Dimensionality Reduction and Reduced Order Modeling for Traveling Wave Physics.* 72nd Annual Meeting of the APS Division of Fluid Dynamics, Nov 2019.

- **A Mendible**, A Aravkin, W Lowrie, JN Kutz and SL Brunton. *The Space-time Problem with Model Reduction for Traveling Waves.* SIAM Computer Science and Engineering, Mar 2019.

- NB Erichson, **A Mendible**, S Wihlborn, JN Kutz. *Randomized Nonnegative Matrix Factorizations.* SIAM Applied Linear Algebra, 2018.

- **A Mendible**. *Numerical Solutions to Nonlinear Water Wave Equations.* Seattle University Undergraduate Research Association Conference, 2015.

FELLOWSHIPS AND AWARDS

Graduate Diversity Fellowship *University of Washington Graduate Opportunities and Minority Achievement Program*	2016, 2020
Steve and Lynn Pratt Fellowship	2017, 2020
Wynne Alexander Guy Spirit of the Mathematics Department Award *Seattle University Mathematics Department (Retroactive)*	2019
Wei Li and Dongmei Chen Endowed Fellowship	2017
Brian and Mary Fabien Endowed Fellowship	2016-2017
Undergraduate Research Award *Clare Boothe Luce Foundation*	2014

TEACHING

Teaching Assistant *University of Washington*	Fall 2017 *Mechanics of Materials*
Lead Learning Assistant *Seattle University*	2013-2016 *Calculus II & Differential Equations*

OUTREACH AND SERVICE

Mechanical Engineering Students Against Racism 2020
· Meetings to discuss how mechanical engineering graduate students can be more anti-racist, and promoting institutional change to department administration
· Volunteering at various organizations that promote racial and economic justice

Crafters Against CoVID-19 2020
· Sewing masks for donation to community organizations and nonprofits

Graduate School Colloquium Panelist Oct 2019
Seattle University Mathematics Department

Engineering Discovery Days 2016, 2019
College of Engineering, University of Washington
· Built a chaotic water wheel with live data acquisition to educate 4,500 grade-school students

Bike & Build Drift West 2017
· Raised over $3k for affordable housing, completed sweat equity hours with local organizations, participated in affordable housing curriculum
· Engaged in 5 community build days connected by 1k miles of cycling

UW Society of Women Engineers Outreach 2016
· Traveled to local elementary and middle schools to demonstrate interactive science experiments

OTHER SKILLS

Software & Programming	MATLAB & Simulink, Python, COMSOL, Solidworks
Prototyping	Arduino, sensors, 3D printing, machine shop fabrication
Data Science	Unsupervised learning, regression, clustering, classification, optimization, data visualization, open-source software development
Languages	Intermediate-level formal written and spoken Spanish