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## Qualification Summary

APPLIED MATHEMATICS PH.D. (March 2022) Extensive image and signal processing experience using both computational and analytic tools. Skilled coder in Julia and Python. Experience with diverse signal processing problem domains.

Education		General Skills	
MAR. 2022	<b>University of California Davis</b> Doctor of Philosophy Applied Mathematics	PROGRAMMING LANGUAGES	Julia, $\LaTeX$ , Python MATLAB, Fortran C, Mathematica, Java
MAY 2014	<b>University of Wisconsin Madison</b> Bachelors of Science Mathematics Honors in the Major Physics Computer Science	PROGRAMMING FRAMEWORKS	Julia: Flux, MLJ Python: Tensorflow, Scikitlearn, PyTorch
		TOOLS	Bash, Slurm, git

## Research Experience

MAY 2016- DEC 2022	Dissertation work advised by Naoki Saito. Title: On Interpreting Sonar Data Using the Scattering Transform classified ocean floor objects such as unexploded ordinance using the Scattering Transform wrote julia packages to perform differentiable parallel and GPU Scattering Transforms adapted Fortran library to generate synthetic sonar examples used julia autodiff to generate interpretable examples of used Scattering Transform features
JUNE 2018- SEPT. 2018	Machine Learning Internship at Bell Labs examined the role of depth in convolutional neural networks Tensorflow based NN experiments, computing mutual information Theoretical examination of complexity with depth
AUG. 2016- JUNE 2018	Graduate student researcher: Closed-Loop phase-locked Stimulation collaborated with a team of 10 graduate students and professors developed matlab real-time phase estimation methods in a high noise environment for use in brain stimulation techniques
MAY 2013- JULY 2013	Undergraduate Research at UNIVERSITY OF WISCONSIN Madison Collaborated with a team of 4 graduate and undergraduate students characterized solutions to KPP-reaction diffusion equation
FEB. 2012- MAY 2012	Collaborative Undergraduate Research Lab Studied elliptic curves over finite fields worked with a team of 3 undergraduate students determined statistical behavior based on computational sampling

## Posters & Presentations

DEC. 2019	Talk at the Bay Area Scientific Computing Day The Shattering Transform: formalizing convolutional networks to analyze few example raw sonar data
NOV. 2019	Poster at DeepMath2019 The collating transform: bridging the gap between the scattering transform and CNNs
NOV. 2018	Talk at the Oberwolfach Seminar on the Mathematics of Deep Learning Underwater Object Classification Using Scattering Transform of Sonar
AUG. 2017	Talk at the 18th Wavelets and Sparsity SPIE conference presentation accompanying the conference proceeding below

## Publications

- Graham, Cole, Tau Shean Lim, Andrew Ma, and David Weber. 2018. “*Existence and Non-Existence of Transition Fronts in Mixed Ignition-Monostable Media.*” *Nonlinearity* 31 (2). IOP Publishing:651.
- Naoki Saito & David Weber *Underwater object classification using scattering transform of sonar signals*, Proc. SPIE 8138, Wavelets and Sparsity XVII, 103940K (24 August 2017)
- W. H. Chak, N. Saito and D. Weber, “The Scattering Transform Network with Generalized Morse Wavelets and its Application to Music Genre Classification”, *2022 International Conference on Wavelet Analysis and Pattern Recognition (ICWAPR)*, 2022, pp. 25-30.

## Leadership

SEPT 2018 -	GGAM Graduate Student Representative
JUNE 2020	Represent the graduate students on the graduate group in applied mathematics executive committee
OCT 2017-	Student-run Math and Applied Math Seminar, UC Davis
JUNE 2019	Co-organized widely attended weekly seminar for graduate student presentations
NOV 2015	Davis Math Conference Co-organized a 1 day conference for Davis mathematicians
OCT 2015-	GSA Applied Mathematics General Assembly Representative
JUNE 2017	Represented the Applied Math Graduate students in the Graduate Student Association General Assembly

## Teaching Experience

FALL 2014-SPRING 2021 | Calculus Teaching Assistant, 11 quarters