

Oscar F. Leong

CONTACT INFORMATION

Computational and Applied Mathematics
Rice University
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Houston, Texas 77005

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<https://www.caam.rice.edu/~ofl2/>

RESEARCH INTERESTS

Deep learning, convex/nonconvex optimization, high dimensional probability, signal recovery, phase retrieval, compressed sensing.

EDUCATION

Rice University

Ph.D. Candidate, Computational and Applied Mathematics (expected May 2021)
- Advisor: Dr. Paul Hand
- National Science Foundation (NSF) Graduate Research Fellow
M.A. in Computational and Applied Mathematics, May 2019

Swarthmore College

B.A. in Mathematics, May 2016

Budapest Semesters in Mathematics

Study abroad program, Spring 2015

EXPERIENCE

SCS-Noonan Scholars

Alumni Trustee, Boston Board of Trustees (June 2020–current)

Northeastern University

Part-time Lecturer, Department of Mathematics (August 2019–current)
Visiting Scholar, Department of Mathematics (August 2018–May 2021)

Lawrence Livermore National Laboratory

Intern, Data Science Summer Institute (June 2019–August 2019)
- Mentor: Dr. Wesam Sakla

PUBLICATIONS

P. Hand, **O. Leong**, V. Voroninski, *A Deterministic Condition for Convergence in Non-Smooth Phase Retrieval*, in preparation

P. Hand, **O. Leong**, V. Voroninski, *Compressive Phase Retrieval: Optimal Sample Complexity with Deep Generative Priors*, submitted, arXiv:2008.10579

M. Asim, M. Daniels, **O. Leong**, A. Ahmed, P. Hand, *Invertible Generative Models for Inverse Problems: Mitigating Representation Error and Dataset Bias*, International Conference on Machine Learning (ICML) 2020

O. Leong, W. Sakla, *Low Shot Learning with Untrained Neural Networks for Imaging Inverse Problems*, Neural Information Processing Systems (NeurIPS) 2019 Workshop on Solving Inverse Problems with Deep Networks (**LatinX in AI oral presentation**)

P. Hand, **O. Leong**, V. Voroninski, *Phase Retrieval Under a Generative Prior*, Neural

Information Processing Systems (NeurIPS) 2018 (**NeurIPS oral presentation, %0.6 submissions**)

B. Kuture, **O. Leong**, C. Loa, M. Sondjaja, F. E. Su, *Proving Tucker's Lemma with a Volume Argument*, in Proceedings of the AMS Special Session on Algebraic and Geometric Methods in Discrete Mathematics, Contemporary Mathematics, American Mathematical Society

TALKS

Learned Generative Priors for Imaging Inverse Problems, PhD Thesis Proposal, Virtual. (August 2020)

Low Shot Learning with Untrained Neural Networks for Imaging Inverse Problems, LatinX in AI Workshop, Vancouver, Canada. (December 2019)

Phase Retrieval Under a Generative Prior, Sampling Theory and Applications (SampTA), Bordeaux, France. (July 2019)

Phase Retrieval Under a Generative Prior, Lawrence Livermore National Laboratory Machine Learning Reading Group, Livermore, California. (June 2019)

Phase Retrieval Under a Generative Prior, Neural Information Processing Systems (NeurIPS), Montréal, Canada. (December 2018)

Phase Retrieval Under a Generative Prior, Master's Thesis Defense, Rice University. (October 2018)

Phase Retrieval Under a Generative Prior, Dept. of Mathematics Graduate Student Seminar, Northeastern University. (October 2018)

Proving Tucker's Lemma With a Volume Argument, Dept. of CAAM Graduate Student Seminar, Rice University. (September 2016)

Helly's Theorem and it's Generalization to the Union of Convex Sets, Swarthmore Senior Showcase, Swarthmore College. (May 2016)

Proving Tucker's Lemma With a Volume Argument, Young Mathematician's Conference, Ohio State University. (August 2015)

Ranks of Graphs in \mathbb{Z}_2 , Joint Mathematics Meetings, San Antonio, Texas. (January 2015)

POSTER
PRESENTATIONS

Invertible Generative Models for Inverse Problems: Mitigating Representation Error and Dataset Bias, ACM Richard Tapia Diversity in Computing Conference, Virtual. (September 2020)

Invertible Generative Models for Inverse Problems: Mitigating Representation Error and Dataset Bias, International Conference on Machine Learning, Virtual. (July 2020)

Low-Shot Learning with Untrained Neural Networks for Imaging Inverse Problems, NeurIPS Deep Inverse Workshop, Vancouver, Canada. (December, 2019)

Enforcing Deep Generative Priors in Phase Retrieval with Optimal Recovery Guarantees, ACM Richard Tapia Diversity in Computing Conference, San Diego, California.

(September 2019)

Low-Shot Learning with Untrained Neural Networks for Imaging Inverse Problems, Lawrence Livermore National Laboratory Summer Poster Session, Livermore, California. (August, 2019)

Phase Retrieval Under a Generative Prior, Workshop on Scientific Machine Learning, ICERM, Brown University. (January 2019)

Phase Retrieval Under a Generative Prior, Neural Information Processing Systems (NeurIPS), Montréal, Canada. (December 2018)

Phase Retrieval Under a Generative Prior, Blackwell-Tapia Conference, ICERM, Brown University. (November 2018)

Helly's Theorem and its Generalization to the Union of Convex Sets, Swarthmore Sigma Xi, Swarthmore College. (May 2016)

Proving Tucker's Lemma With a Volume Argument, Joint Mathematics Meetings, Seattle, Washington. (January 2016)

Proving Tucker's Lemma With a Volume Argument, SACNAS Conference, Washington, DC. (October 2015)

Ranks of Graphs in \mathbb{Z}_2 , SACNAS Conference, Los Angeles, California. (October 2014)

TEACHING
EXPERIENCE

Northeastern University

Spring 2020 Instructor of Record, Calculus for Business & Economics

Fall 2019 Instructor of Record (2 sections), Calculus for Business & Economics

Rice University

Spring 2018 Teaching Assistant, Introduction to Engineering Computation

Fall 2017 Teaching Assistant, Introduction to Engineering Computation

Richard Tapia Center for Excellence & Equity

Summer 2017 Lead Instructor, Tapia Camps: Computer Science

Swarthmore College

Fall 2013 Teaching Assistant, Single Variable Calculus

South Central Scholars (SCS)

Summer 2013 Teaching Assistant, SCS Summer Academy, Calculus I

HONORS AND
AWARDS

2020	ACM Tapia Conference Scholarship
2019	LatinX in AI Oral Presentation
2019	LatinX in AI Travel Grant
2019	NeurIPS Travel Grant
2019	ACM Tapia Conference Travel Scholarship
2018	NeurIPS Oral Presentation
2018	NeurIPS Travel Grant
2018–2021	NSF Graduate Research Fellowship, Accepted
2018	NPSC Graduate Research Fellowship Finalist
2016	Brinkmann Prize for Outstanding Mathematical Paper, Swarthmore College
2014	Best Undergraduate Poster Presentation in Mathematics, SACNAS
2012–2016	Cedar SoCAL Scholar
2012–2016	Philip Evans Scholar, Swarthmore College
2012	Hispanic Heritage Youth Awards: Gold Medal in Mathematics & Engineering

TECHNICAL SKILLS Languages: Python & MATLAB

Packages & tools: PyTorch (Competent) & Tensorflow (Basic)

GRADUATE
COURSEWORK

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| <input type="checkbox"/> Real Analysis I | <input type="checkbox"/> Numerical Methods for PDEs |
| <input type="checkbox"/> Adv. Numerical Analysis I & II | <input type="checkbox"/> Optimization Theory |
| <input type="checkbox"/> Computational Science I | <input type="checkbox"/> Random Processes & Applications |
| <input type="checkbox"/> Signal Recovery Theory | <input type="checkbox"/> Mathematical Probability |
| <input type="checkbox"/> Linear and Integer Programming | <input type="checkbox"/> Numerical Linear Algebra |
| <input type="checkbox"/> Neural Machine Learning | <input type="checkbox"/> Partial Differential Equations |