JOSEPH TATRO

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EDUCATION

Rensselaer Polytechnic Institute
Doctor of Philosophy, Applied Mathematics — May 2021
Master of Science, Applied Mathematics — December 2018
Research Interests: Machine Learning, Optimization, & Computational Geometry
Advisor: Rongjie Lai
GPA: 4.00

The University of Texas at Austin
Bachelor of Science, Mathematics — May 2016
Option: Pure Mathematics
GPA: 3.81

COMPUTER SKILLS

Programming Languages: Python, MATLAB, C++, Java
Notable Libraries: NumPy, SciPy, PyTorch, Tensorflow, OpenCV
Other Computer Languages: HTML, CSS
Applications: Microsoft Office, Excel, Git

EXPERIENCE

RPI - Department of Mathematical Sciences – *Research Assistant;* Troy, NY — Spring 2019 - Fall 2020

- Investigate learning of geometry; designing neural networks for disentanglement of shape and pose in several projects
- Explore geometry of learning; improving performance of *mode connectivity* algorithms by accounting for neural network weight symmetry

Systems & Technology Research – *Computer Vision Research Intern;* Boston, MA — Summer 2017, Summer 2018

- Predicted disparity maps from stereo rectified images by retraining Siamese neural network in PyTorch with added data
- Constructed 3D models of urban scenes by reprojecting disparity maps output from network to world coordinates
- Developed algorithms in MATLAB for real-time georegistration of narrow FOV airborne video to satellite images, speeding up pre-existing implementation by 80%

UCSD - Jaffe Underwater Imaging Lab - *Marine Physical Laboratory Intern;* La Jolla, CA — Summer 2015

- Imaged focal stacks of coral skeletons using depth-scanning microscope to generate high resolution images
- Implemented Structure from Motion algorithms to create a 3D model of coral skeleton

LEADERSHIP EXPERIENCE AND ACTIVITIES

Society for Industrial and Applied Mathematics - *RPI Chapter President* — Fall 2016 - Summer 2017

- Organized professional and social events to promote growth of chapter and further members' career development
- Identified, scheduled, and hosted speaker, matching the department's research interests, for Spring 2017 colloquium

HONORS

- IBM AI Horizons Network Scholar — Spring 2019 - Fall 2020
- Senior Fellow/Visiting Graduate Researcher at the Institute for Pure and Applied Mathematics — Spring 2019
- NSF GRFP - Honorable Mention (Computational Mathematics) — Spring 2018
- Douglas A. Parker Memorial Endowed Presidential Scholarship — Fall 2014 - Spring 2016
- Katie Murray II Unrestricted Endowed Presidential Scholarship — Fall 2015 - Spring 2016

ADDITIONAL INFORMATION

Interests: Songwriting, concerts, puzzles, running
Work Eligibility: Eligible to work in the U.S. with no restrictions

PUBLICATIONS

- **Tatro, N. J.**, Chen, P. Y., Das, P., Melnyk, I., Sattigeri, P., & Lai, R. (2020). Optimizing Mode Connectivity via Neuron Alignment. *To appear in: Advances in Neural Information Processing Systems*.
- **Tatro, N. J.**, Das, P., Chen, P. Y., Chenthamarakshan, V., & Lai, R. (2020). ProGAE: A Geometric Autoencoder-based Generative Model for Disentangling Protein Dynamics. Submitted
- **Tatro, N. J.**, Schonsheck, S. C., & Lai, R. (2020). Unsupervised Geometric Disentanglement for Surfaces via CFAN-VAE. *arXiv preprint arXiv:2005.11622*. Submitted

CONFERENCE PRESENTATIONS

Upcoming

- **Tatro, N. J.**, Chen, P. Y., Das, P., Melnyk, I., Sattigeri, P., & Lai, R. (December, 2020). Optimizing Mode Connectivity via Neuron Alignment. Poster session presented at the Conference on Neural Information Processing Systems, Vancouver, Canada.