Narathip (Nick) Reamaroon

Phone 858-752-2764
Email nreamaro@umich.edu
Website nickreamaroon.com
LinkedIn /nreamaroon

Education

PhD in Computational Medicine & Bioinformatics, University of Michigan, Ann Arbor, MI. 2016 - 2020

- **Dissertation**: Machine Learning with Label Uncertainty and Learning Using Partially Available Privileged Information
- **Main courses**: Machine Learning, Signal Processing and Machine Learning, Deep Learning in Bioinformatics, Applied Data Science, Mathematics of Biological Networks, Linear Algebra, Probability and Computing, Biostatistics
- **Activities**: Involved in education outreach efforts and undergrad/graduate mentorship opportunities.

BS in Computational Neuroscience, University of California, San Diego, La Jolla, CA. 2009 - 2013

- **Main courses**: Information Theory, Algorithms for Analysis of Neural Data, Biophysical Basis of Neuronal Computation, Neurodynamics, Computational Neurobiology, Waves & Optics, Multivariate Analysis, Probability Theory.

Skills

- **Programming languages**: Python, Matlab, R.
- **Machine learning**: TensorFlow, Keras, PyTorch, Scikit-learn.
- **Spoken languages**: English (native), Thai (fluent), Spanish (conversational)
- **Misc**: Git, distributed computing, SQLite, Tableau, HTML5, CSS3.

Experience

Graduate Researcher, Biomedical & Clinical Informatics Lab, Ann Arbor, MI. 2016 - present

Worked under the supervision of Dr. Kayvan Najarian on applications of artificial intelligence and machine learning in health research and medicine.

- Developed theoretically motivated, principled algorithms for predictive modeling and assessment of critical illnesses.
- Implemented heteroscedastic dropout in reinforcement learning and additional methods (see Projects) to incorporate label uncertainty and learning using partially available privileged data (*LULUPAPI*) during model training.
- Led multiple projects from start to finish: including data acquisition + processing, algorithm development, model training + validation, and publications in multiple journals and conferences.

Research Associate, Dart Neuroscience, San Diego, CA. 2014 - 2016

Predictive modeling, statistical analysis, and assay validation for drug discovery.

- Built data visualization dashboard with an interactive interface (Tableau) to improve high-throughput screening efficiency.
- Deployed and maintained machine learning models for real-time analysis of EC50 from target dose response curves.

Projects

Privileged Information in Reinforcement Learning, Support Vector Machines, and Gradient Boosting 2020 - present

Learning Using Privileged Information (LUPI) paradigm for utilizing knowledge/data only available during model training.

- Implemented LUPI paradigm to ML models (AdaBoost & Random Forest) with knowledge transfer and distillation.
- Improved on existing reinforcement learning implementations with heteroscedastic dropout for privileged information.
- Created a custom sequential minimal optimization style algorithm to solve for partially available data in SVM+.

Directional Blur & Transfer Learning 2019 - 2020

Predictive modeling and detection of critical illness (acute respiratory distress syndrome) from chest x-rays.

- Developed novel feature extraction technique (Directional Blur) to capture diffuse lung opacities as a mathematical concept.
- Implementation of deep learning and transfer learning with pre-trained networks to extract features using Keras.

Label Uncertainty from Clinical Ambiguity in Medical Diagnosis 2017 - 2018

Early detection of disease, outcome prediction, and continuous health monitoring.

- Designed a library of tools to account for diagnostic uncertainty in supervised and semi-supervised learning tasks.
- Time-series analysis of longitudinal health record data with stochastic modeling under strong mixing conditions.

More projects, information, and list of publication available at nickreamaroon.com