ILEANA RUGINA

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EDUCATION

Massachusetts Institute of Technology, Cambridge MA
MEng. in EECS (5.0/5.0 GPA) , B.S. in EECS and Physics Sep. 2015 - May 2021
Selected CS coursework: Algorithms, Machine Learning, Statistical Learning, Optimization for ML; Bayesian Modeling, Meta-Learning, Statistics Computation & Applications; Computer Systems, Software Construction.

WORK AND RESEARCH EXPERIENCE

MEng Research Assistant at MIT Soljačić Lab Jul. 2019 - Present
- Designed a data-informed task-agnostic attention pruning method for transformer models. Evaluated performance on various models (autoregressive, autoencoder, or seq-to-seq transformers). Used sparse GPU kernels to lower memory footprint by 30% and increase inference speed by 10%.
- Defined a few-shot multi-task image translation benchmark on a large-scale meteorological dataset. Improved performance of GANs using meta-learning algorithms and contrastive pretraining.
- References: Professor Marin Soljačić (MIT), Dr. Preslav Nakov (QCRI).

Undergraduate Research Assistant at MIT Kavli Institute Sep. 2018 - Jan. 2019
- Implemented multi-scale convolutional autoencoders to compress time-series data.
- Used unsupervised binary classifiers on the latent representation to perform anomaly detection.

Research Intern at Celixir
Stratford-upon-Avon, UK Jun. 2018 - Aug. 2018
- Performed cell image analysis (segmentation, feature extraction) to predict cell culture health.
- Estimated feature importance to design future experiments and reduce number of assays.
- Collaborated with biologists to incorporate expert priors in Bayesian models using a web based GUI.

Research Intern at Shell Technology Centre Bangalore
Bangalore, India Jun. 2017 - Aug. 2017
- Analysed fluid connectivity in 3D porous media to facilitate fluid dynamics simulations. Skeletonized 3D voxel grids using either their distance transforms or thinning algorithms. Implemented and evaluated heuristics for graph search algorithms to speed up numerical simulations.

TEACHING EXPERIENCE

MIT 6.004 Computation Structures Teaching Assistant Sep. 2019 - Dec. 2019
- Computer architecture introductory class. Assignments include writing assembly and HDL code.
- Held recitations and office hours to assist with lecture material and coding assignments.

CLASS/PERSONAL PROJECTS

- Java Programming: networked multiplayer Pinball game.
- ML Theory: Last Iterate Convergence of EG Methods for Variationally Coherent Min-Max Problems.
- Applied ML: Meta-Learning Symbolic Regression, Phase-Coded Bayesian Neural Networks.

ACADEMIC ACHIEVEMENTS

Publication: Data-Informed Global Sparseness in Attention Mechanisms for Deep Neural Networks
Silver Medal - Asian Physics Olympiad; **Bronze Medal** - International Physics Olympiad 2015

SKILLS AND INTERESTS

Technical Skills: Python (TF, PyTorch, PyMC3, Scikit-learn), Go, Java, C; bash, slurm, docker.
Academic Interests: Few-Shot and Self-Supervised Learning, NLP, Optimization, HPC.