Aditya Ranganath

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EDUCATION

- **University of California** — Merced, CA
  PhD Candidate in Electrical Engineering and Computer Science — *Aug. 2018 – Graduating 15th Aug., 2023*

- **University of California** — Merced, CA
  Masters in Electrical Engineering and Computer Science — *Aug. 2016 – Aug. 2018 (Switched to PhD)*

- **Loyola-ICAM College of Engineering and Technology** — Chennai, Tamil Nadu, India
  B.E. in Electrical and Electronics Engineering — *Aug. 2010 - Aug. 2014*

EXPERIENCE

- **Meta Inc.** — Menlo Park, CA
  Applied Research intern — *May 2022 - August 2022*
  - Infrastructure: Built natural language processing pipelines for suggested replies under the Business messaging services team across Instagram, Facebook, Whatsapp with user privacy in mind.
  - Machine learning: Leveraged deep learning and machine learning tools to infer over data potentially impacting billions of people.

- **Nebbiolo Technologies** — Mountain View, CA
  Software Engineer Intern — *June 2017 - Aug. 2017*
  - Paramiko: Engineered pipelines to remote toggle "fog" nodes using a python interface paramiko.
  - Robot manipulation: Analysed stress on fog nodes and performing load balance on these nodes.

- **University of California - Merced** — Jan. 2017 - Current
  Teaching/Research Assistant — *Merced, CA*
  - Teaching Assistant: Teaching Flask, HTML, javascript, CSS, SQL, C++, Calculus, Finite element methods, linear algebra for undergraduate Junior and Senior years
  - Research Assistant - Machine Learning: Designing time-dependent data starved models to understand particle dynamics on the subatomic level. Also, learning to design models for highly chaotic dynamical systems like the double pendulum.

PROGRAMMING SKILLS

- **Languages**: Python, Javascript, C++, SQL, Java, MATLAB

- **Libraries**: TensorFlow, Pytorch, JAX, theano, numpy, scipy, scikit-learn, Presto. Spark

PROJECTS

- QuantumRNN: Used deep learning and numerical techniques on physical chemistry problems.
- Optimization for deep learning: Designed optimizers using quasi-Newton methods in a deep learning setting.
- Image-processing: Designed deep learning architectures to reduce Gaussian and Poisson noise in images.
- Adversarial detection: Performed image compression and clustering to detect targeted attacks on deep networks.
- Optimization for Reinforcement learning: Constrained optimization approach using quasi-Newton approximations in a reinforcement learning setting.

COURSES

- Graduate Courses: Intro to Robotics, Database Implementation systems, Numerical Methods for Differential Equations, Deep Learning, Advanced Topics in Networks and Distributed Systems, Computational Geometry, Cloud Computing, Robot Algorithms, Distributed Systems, Computer Graphics

- Undergraduate Courses: Tranforms and Partial Differential Equations, Numerical Methods, Transmission and Distribution, Power Electronics, Object Oriented Programming, Data Structures, Digital Signal Processing, Electromagnetic Theory, Power Plant Engineering, Biemedical Engineering

Publications

- Pooya Tavallali, Vahid Behzadan, Azar Alizadeh, Aditya Ranganath, and Mukesh Singhal. Adversarial label-poisoning attacks and defense for general multi-class models based on synthetic reduced nearest neighbor. In *2022 IEEE International Conference on Image Processing (ICIP)*, pages 3717–3722, 2022, doi: 10.1109/ICIP46576.2022.9897807.

- Aditya Ranganath, Omar DeGuchy, Fabian Santiago, Mukesh Singhal, and Roummel Marcia. Recurrent nerual imaging: An evolutionary approach for mixed possion-gaussian image denoising. In *2022 21st IEEE International Conference on Machine Learning and Applications (ICMLA)*, pages 484–489, 2022, doi: 10.1109/ICMLA55696.2022.00078.

- Azar Alizadeh, Pooya Tavallali, Vahid Behzadan, Aditya Ranganath, and Mukesh Singhal. A novel approach for synthetic reduced nearest-neighbor leveraging neural networks. In *2022 21st IEEE International Conference on Machine Learning and Applications (ICMLA)*, pages 831–836, 2022, doi: 10.1109/ICMLA55696.2022.00138.

- Boaz Ilan, Aditya Ranganath, Jacqueline Alvarez, Shilpa Khatri, and Roummel Marcia. Interpretability of relu for inversion. In *2022 21st IEEE International Conference on Machine Learning and Applications (ICMLA)*, pages 1190–1195, 2022, doi: 10.1109/ICMLA55696.2022.00192.

- Azar Alizadeh, Mukesh Singhal, Vahid Behzadan, Pooya Tavallali, and Aditya Ranganath. Stochastic induction of decision trees with application to learning haar trees. In *2022 21st IEEE International Conference on Machine Learning and Applications (ICMLA)*, pages 825–830, 2022, doi: 10.1109/ICMLA55696.2022.00137.

- Jason Van Tuinen, Aditya Ranganath, Goran Konjevod, Mukesh Singhal, and Roummel Marcia. Novel adversarial defense techniques for white-box attacks. In *2022 21st IEEE International Conference on Machine Learning and Applications (ICMLA)*, pages 617–622, 2022, doi: 10.1109/ICMLA55696.2022.00095.

- Aditya Ranganath, Omar DeGuchy, Mukesh Singhal, and Roummel F. Marcia. Second-order trust-region optimization for data-limited inference. In *2021 29th European Signal Processing Conference (EUSIPCO)*, pages 2059–2063, 2021, doi: 10.23919/EUSIPCO54536.2021.9616149.

- Aditya Ranganath, Omar DeGuchy, Mukesh Singhal, and Roummel F. Marcia. Multi-stage gaussian noise reduction with recurrent neural networks. In *2021 55th Asilomar Conference on Signals, Systems, and Computers*, pages 135–139, 2021, doi: 10.1109/IEEECONF53345.2021.9723266.

Mentoring Experience

- **Achyuth Kolluru** (2023): Frame interpolation techniques in videos.
- **Abbas Siddiqui** (2023): Optimization techniques in reinforcement learning.
- **Jason Van Tuinen** (2022): Deep learning defense strategies.
- **Denylson Fuentes** (2019): Image processing using deep learning.

Conference Refree

- *International Conference on Machine Learning, 2023*

- *International Conference on Machine Learning, 2022*

- *Conference on Neural Information Processing Systems, 2022*