JEFFREY LAI

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Education

University of Illinois Urbana-Champaign **Aug 2017 - May 2021**
B.S. in Engineering Physics with High Honors (Minors in Computer Science & Math) GPA: 3.91/4.00

University of Texas at Austin (Incoming) **Aug 2022 - Present**
Ph.D. in Computational Science & Engineering (Oden Institute) GPA: [N/A]/4.00
Advisor: Atlas Wang

Academic Positions

Research Assistant, UIUC ECE Department **Aug 2019 – Present**
- Conducting CV and ML research with Professor Alexander Schwing

Chair of SIGAI, Association of Computing Machinery (ACM) at UIUC **Oct 2018 – May 2021**
- Organized ML/AI research seminars and coding tutorials for undergraduate and graduate students

Teaching Assistant, UIUC CS Department **Aug 2020 – May 2021**
- TA for CS446 Machine Learning (Professor Sanmi Koyejo and Alexander Schwing)

Deep Learning Research Assistant, Naval Research Laboratory (NRL) **May 2018 - Aug 2018**
- Developed joint image-text neural networks for few-shot image recognition with Dr. Leslie Smith

Professional Experience

AI Developer, Trova AI **June 2021 – Present**
- Personalized information retrieval over communication spaces
- Developing knowledge graphs in application to search and query autocompletion for conversation data

Software Engineering Intern, Facebook AI Applied Research **May 2020 – Aug 2020**
- Extreme Vision team in the CV/AR group focusing on advertisement clustering methods
- Implemented variants of the ads recommendation pipeline to improve the existing production model

Machine Learning Intern, Capital One **June 2019 – Aug 2019**
- Machine learning team focusing on natural language processing applications
- Implemented production-grade entity recognition models for unstructured documents using TensorFlow

Publications

A. S. Dogra, J. B. Lai, et. al., *Internal Error Estimation and Correction by Neural Network Differential Equation Solvers*, under review (*Proc. Natl. Acad. Sci.*), 2021.

A. S. Dogra, J. B. Lai, et. al., *A Correspondence between Koopman Operator and Neural Tangent Kernel Models of Optimization Dynamics*, under review (*Phys. Rev. Lett.*), 2021.

Invited Talks

Error Estimation and Correction by NN DE Solvers, VITA Seminar, UT Austin **Dec 2021**

Some Mathe-Physical Perspectives on Deep Learning, Stochastic Finance Group, ETH Zurich **Dec 2021**

Introduction to Machine Learning in Python, HackIllinois, UIUC **Aug 2020**

- Video link: https://www.youtube.com/watch?v=Q97ZEgupAvY

Awards

Dean's List **Fall 2017-2020**
Illinois Engineering Achievement Scholarship ($3k) **May 2018**
Illinois Scholars Undergraduate Research (ISUR) Scholarship ($2.5k) **Apr 2020**
Western Digital Scholarships for STEM, We.care Scholarship ($5k) **May 2020**

Projects

Neural Network Differential Equation Solvers

- Neural Network DiffEq solvers with in-built error estimation and correction capabilities

Machine Learning Tutorials: https://github.com/jbial/ml-tutorials

- Comprehensive, hands-on machine learning Jupyter Notebook tutorials for students at SIGAI

Convolution Tutorial: https://github.com/jbial/convolution

- In-depth tutorial about convolution per-request from members of SIGAI

Miscellaneous Math Notebooks: https://github.com/jbial/miscellaneous-math

- A series of notebooks exploring random topics in mathematics and computation

Skills

Programming Languages: Python, C/C++, Go, MATLAB, Java

Frameworks/Libraries: PyTorch, TensorFlow, JAX, NumPy, Detectron, SciPy

Technical Skills: Machine/Deep Learning, Numerical Methods, Scientific Computing, Data Analysis, Numerical Analysis, Software Engineering