AMIT JENA

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OBJECTIVE

Seeking an Internship/Co-op position for Spring/Summer 2024.

INTEREST AREAS

Meta-learning, Reinforcement Learning, Transformer Models, Stability Analysis, Power Systems

EDUCATION

2020 - present	**Ph.D., Electrical Engineering**, Texas A&M University, Advisor: Dr. Le Xie, **GPA**: 3.80/4.00
2017 - 2020	**M.S., Electrical Engineering**, Iowa State University, **GPA**: 3.88/4.00
2011 - 2016	**Integrated Bachelors and Masters in Science, Mathematics**, National Institute of Technology (NIT), Rourkela, **GPA**: 8.09/10

HONORS AND RECOGNITIONS

- Recipient of Powell Fellowship at Texas A&M University for 2023-24.
- Recipient of Electrical and Computer Engineering Ph.D. Merit Fellowship at Texas A&M University for 2020-21.
- Recipient of Principal Financial Group Scholarship for 2019 at Iowa State University.
- Class rank 1 in Integrated Msc. in mathematics at NIT Rourkela in 2013-14 and 2014-15.

PUBLICATIONS

Submitted/Pre-prints

1. **A. Jena**, T. Huang, S. Sivaranjani, D. Kalathil, Le Xie, Distributed Learning of Neural Lyapunov Functions for Large-Scale Networked Dissipative Systems, under review. Available on Arxiv here.

Published/Accepted

1. **A. Jena**, D. Kalathil, Le Xie, Meta-learning-based Adaptive Stability Certificates for Dynamical Systems, accepted for AAAI-24 *(The 38th Annual AAAI Conference on Artificial Intelligence)*.
2. R. Kumar, R. R. Hossain, S. Talukder, **A. Jena**, A. Ghazo, Recursive Histogram Tracking-Based Rapid Online Anomaly Detection in Cyber-Physical Systems, *IEEE Transactions on Systems, Man, and Cybernetics: Systems*, 2022. Available here.
3. **A. Jena**, T. Huang, S. Sivaranjani, D. Kalathil, Le Xie, Distributed Learning-based Stability Assessment for Large Scale Networks of Dissipative Systems, *IEEE Conference on Decision and Control (CDC)*, 2021. Available here.
4. S. R. Sahoo, S. P. Sahoo, **A. Jena**, K. C. Pati, Optimal control on Schrödinger Lie group and the behavior of the dynamics, *IMA Journal of Mathematical Control and Information*, 2018. Available here.
5. S. Rana, B. Mishra, **A. Jena**, Numerical investigation of steady-state heat conduction in arbitrary shaped heat exchanger tubes with mutliply connected cross sections, *International Journal of Applied and Computational Mathematics*, 2018. Available here.
6. S. P. Sahoo, **A. Jena**, S. R. Sahoo, K.C. Pati, Optimal control, stability and numerical integration on SU(3), *International Journal of Applied and Computational Mathematics*, 2017. Available here.
7. S. Rana, **A. Jena**, A BEM formulation of two dimensional steady state heat conduction in exchanger tubes of arbitrary cross sections, *International Journal of Heat and Mass Transfer*, 2017. Available here.
8. **A. Jena**, P. Sahu, S. Bharat, B. B. Biswal, Optimal trajectory planning of a 3R SCARA manipulator using geodesic, *ICPEICES IEEE conference held at Delhi Technological University (ICPEICES 2016)*, 2016. Available here.

GRADUATE COURSE PROJECTS

Modified ResNets with Improved Performance Results Fall 2022
Texas A& M University, CSCE 636, Instructor: Dr. S. JI

· Implemented Squeeze and Excitation blocks in a standard ResNet-32 architecture, and employed a label smoothing based loss function. The resulting deep neural network achieved higher prediction accuracy than a regular ResNet-32 on the CIFAR-10 dataset.

Domain Randomization based Robust Power System Voltage Control Spring 2021
Texas A& M University, ECEN 689, Instructor: Dr. D. Kalathil

· Applied domain randomization based reinforcement learning to voltage control problems in power systems. Proposed solution method was robust to uncertainty induced sim-to-real gaps in distribution and transmission systems, while the baseline methods suffered from performance degradation under this setting.

Looping Adversarial Attack on Deep Reinforcement Learning Models Spring 2019
Iowa State University, ME 592X, Instructor: Dr. S. Sarkar

· Designed a novel state-space based bias attack scheme for deep Q network (DQN) models where the trajectory of the RL agent gets trapped in a never ending loop without reaching the destination.

Online Detection of Anomalies in Cyber-Physical Systems Spring 2019
Iowa State University, EE 576, Instructor: Dr. R. Kumar

· Formulated a linear time fast algorithm to detect security attacks such as replay attack and denial of service attack on cyber-physical systems. Estimated and tracked real time distribution of system data packets followed by comparison with a nominal one. The effectiveness of the algorithm was reported through precise attack detection and attack time point estimation.

Uncertain Data Clustering using Optimal Mass Transport Fall 2018
Iowa State University, COM S 578X, Instructor: Dr. K. Liu

· Extended the formulation of the classical K-means algorithm to handle real world uncertain data that occur due to data handling errors and imprecise measurements. The result of this approach, an algorithm termed as WK-means was presented and validated by applying it to synthetic, semi-synthetic and real-world datasets.

Manifold Learning using Vector-valued Optimal Mass Transport Spring 2018
Iowa State University, EE 525X, Instructor: C. Hegde

· Implemented vector-valued optimal mass transport (V-OMT) for manifold learning algorithm on real world massive image datasets.

RELEVANT GRADUATE COURSE HIGHLIGHTS

COM S 578X	Optimization for Machine Learning	**ECEN 689**	Reinforcement Learning
CSCE 636	Deep Learning	**ECEN 713**	Data Sciences and Applications in Modern Power systems

UNDERGRADUATE RESEARCH EXPERIENCE

Reearch Intern at Department of Mechanical Engineering, IIT Bombay 2016 - 17
Advisor: Dr. A. Srivastav

· *Mathematical modelling of crystallization of silicate melt droplets:* Developed the mathematical understanding of crystallization phenomena, simulated the crystal growth process using phase field and boundary element method, and reported an improvement in algorithmic convergence time.

Undergraduate Researcher at Department of Mathematics, NIT Rourkela 2015 - 16
Advisor: Dr. K. C. Pati

· *Optimal control of Lie groups:* This masters thesis work included study of optimal control, controllability, stability and integrability of various Lie groups such as G_2 and SU(3).

SKILLS

Programming Language	C, C++, Python
Deep Learning packages	PyTorch, TensorFlow, Keras
Software	MATLAB, CVX
Typesetting	Excel, Word, Powerpoint, LaTeX

TEACHING EXPERIENCE

- Teaching Assistant for **EE 442 (Introduction to Circuits and Instruments)** at ECpE Department, ISU, Fall'17.
- Teaching Assistant for **EE 324 (Signals & Systems II)** at ECpE Department, ISU, Spring & Fall'18.
- Teaching Assistant for **EE 224 (Signals & Systems I)** at ECpE Department, ISU, Spring & Fall'19.