DEEP SHANKAR PANDEY

390 Clay Rd, Rochester, NY, 14623 | +1 585-747-3830 | https://pandeydeep9.github.io/
linkedin.com/in/pandeydeep9 | pandeydeep9 | dp7972@rit.edu

RESEARCH INTERESTS

Meta-learning, Uncertainty awareness, and Robustness in Machine Learning
Application of Machine Learning and Deep Learning models to real-world problems

EDUCATION

ROCHESTER INSTITUTE OF TECHNOLOGY Rochester, NY
Ph.D. in Computing and Information Sciences Expected August, 2024
Research focus in developing trustworthy deep learning models that can learn from limited data
Cumulative GPA: 3.93/4.00
Relevant Courseworks: Mathematics of Deep Learning; Data-Driven Knowledge Discovery; Statistical Machine Learning;

TRIBHUVAN UNIVERSITY Lalitpur, Nepal
Bachelors in Electronics and Communication Engineering at Institute of Engineering, Pulchowk Campus Nov 2013 - Sept 2017
Average Percentage: 76.39%
Relevant Courseworks: Data Mining; Artificial Intelligence; Big Data Technologies;

PUBLICATIONS

- **Deep Shankar Pandey**, and Qi Yu. "Multidimensional Belief Quantification for Label-Efficient Meta-Learning." *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition* 2022 (**CVPR 2022**)
- Zhu, Yuansheng, Weishi Shi, **Deep Shankar Pandey,** Yang Liu, Xiaofan Que, Daniel E. Krutz, and Qi Yu. "Uncertainty-Aware Multiple Instance Learning from Large-Scale Long Time Series Data." In *2021 IEEE International Conference on Big Data* (**Big Data 2021)**

RESEARCH EXPERIENCE

MINING LAB, RIT. (A research lab at Rochester Institute of Technology) Rochester, NY
Graduate Research Assistant Aug 2019 – Present

- Developed a novel computationally efficient uncertainty aware meta-learning model for few-shot classification tasks. Parts of the work appeared in CVPR 2022. Successfully applied the model for maritime surveillance
- Developed a novel outlier robust and uncertainty aware conditional neural process model for few-shot and any-shot regression problems. The work is under review
- Developing theoretically guaranteed and adversarialy robust uncertainty-aware meta learning models that can learn from limited and noisy data (Ongoing Work)

RESEARCH POTENTIAL ASSESSMENT WORK, RIT. Rochester, NY
Work done for successful completion of Research Potential Assessment Exam Aug 2019 – May 2020

- Worked on efficient optimization-based meta-learning via active-task selection
- Carried out in-depth analysis of the state-of-the-art meta-learning algorithms along with their implementations
- Developed active task selection methods to improve the performance of the meta-learning models across various classification and regression problems

PROJECTS

ATTENTION BASED DEEP SETS TO IDENTIFY CHARACTERISTIC PATTERNS OF CHILDREN WITH AUTISM SPECTRUM DISORDER

A collaboration project as a part of the summer work, 2022

- Worked on development of an attention driven deep learning model that differentiates children with Autism Spectrum Disorder (ASD) from typically developing children using time-series data collected from an interactive Virtual Reality based game environment. Further, developed a framework to identify the key characteristic patterns for the children with ASD

DEVELOPING MACHINE LEARNING MODELS CONSISTENT WITH THE REAL WORLD PHYSICS

Ongoing collaboration project with University of Rochester Research Group, 2022-2023

- Working on extending the Deep Learning models to be consistent with the real world observations and the underlying physics in the real world. Introducing the consistency from architecture modification and physics based regularization

UNCERTAINTY AWARE DECISION MAKING FOR IMPROVED MARITIME SURVEILLANCE

Minor Project as a part of the summer work, 2021

- Worked on development of Bayesian Neural Networks for uncertainty-aware image classification models for maritime-vessel images collected from satellites (SAR data)

HANDWRITTEN DIGIT CLASSIFICATION

Minor Project as a part of Mathematics of Deep Learning course, 2020

- Implemented Neural Network models from scratch in numpy to solve image classification problems
- Worked on analysis of the backpropagation, optimization and vectorization, and sanity checks for the neural networks

MULTIMODAL DATA FUSION TO IMPROVE MEDICAL IMAGE UNDERSTANDING

Minor Project as a part of the Data-Driven Knowledge Discovery course, 2019

- Worked on using deep learning models to combine multimodal information (image of the skin lesion and the verbal description of the lesion) for improved medical diagnosis of different skin diseases

FACE IDENTIFICATION

Minor Project as a part of Artificial Intelligence course, 2016

- Worked on dimensionality reduction and feature extraction using Principal Component Analysis
- Carried out face image classification using multiple classifiers: KNN Classifier, Support Vector Machines, and Logistic Regression

IMPLEMENTATION OF REDIRECTED WALKING IN VIRTUAL REALITY

Final Year Major Project at Institute of Engineering, Pulchowk Campus, Tribhuvan University, 2016

- Researched and implemented different algorithms for translational, rotational, and curvature gains in Redirected Walking (C#, Unity, HTC Vive). Made game environments and worked with maze-generating algorithms

PROFESSIONAL EXPERIENCES

Game Developer at Paracosma, Nepal: As part of the core developer team, created special effects in games, scripted character behaviors, and implemented game environment logic. Nov. 2017 - Apr. 2018

Intern at Paracosma, Nepal: As part of the game developer team, worked on implementation of game character behaviors and the game mechanics Dec. 2016 - Oct. 2017

Intern at E&T, Nepal: As part of the E&T-TU Collaboration project for Blockchain Application. Developed dynamic user interfaces for the project May. 2016 - Sep.. 2016

SKILLS

Programming Languages: Advanced in Python, Intermediate in C, C++ and C#

Machine Learning and Deep Learning: Advanced in Pytorch, Scikit-learn, Numpy, Intermediate in Tensorflow and Keras

Languages: Fluent in English and Nepali; Conversational Proficiency in Hindi

Certifications, Coursera: Bayesian Methods for Deep Learning, Deep Learning Specialization, Python3 Specialization, and Mathematics for Deep Learning Specialization

Personal Growth: Member of Toastmasters at RIT to improve my public speaking, communication and leadership skills.

Leadership: Founder and first president (April 2019 - April 2020) of Nepalese Student Association at RIT