SUDHANSHU MISHRA

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EDUCATION

Indian Institute of Technology, Kanpur	2017 - present
Master of Technology, Mechanical Engineering	CGPA : 9.3/10
Bachelor of Technology, Mechanical Engineering	CGPA : 8.4/10

CISCE, ISC, Class XII	2016
Boys High School and College, Allahabad	94.8%

CISCE, ICSE, Class X	2014
Boys High School and College, Allahabad	93.2%

ACADEMIC HONORS

Awarded the Summer Research Fellowship by INSA, NASI and IAS.	2019
Secured All India Rank 3680 in IIT-JEE Advanced among 170,000 students.	2017
Secured All India Rank 7783 in IIT-JEE Mains among 1,200,000 students.	2017
Selected for student grant to attend FIRE 2019 and present paper.	2019
Selected for poster presentation at EEML Summer School.	2021

INTERNSHIPS

Summer Research Fellowship Programme - Indian Statistical Institute, Kolkata	May 2019- July 2019
Undergraduate Summer Research Program - NYU Tandon School of Engineering	June 2021- Aug 2021

PUBLICATIONS

Goswamy, T., Parmar, N., Gupta, A., Shah, R., Tandon, V., Goyal, V., Gupta, S., Laud, K., Gupta, S., **Mishra, S.**, Modi,A. AI-based Monitoring and Response System for Hospital Preparedness towards COVID-19 in Southeast Asia at Healthcare Systems, Population Health, and the Role of Health-Tech (HSYS 2020), ICML 2020 Workshop. [link]

Mishra, S., Prasad, S., & Mishra, S. (2020). Multilingual Joint Fine-tuning of Transformer models for identifying Trolling, Aggression and Cyberbullying at TRAC 2020. In Proceedings of the Second Workshop on Trolling, Aggression and Cyberbullying (TRAC-2020). [link]

Mishra, S., & **Mishra, S.** (2019). 3Idiots at HASOC 2019: Fine-tuning Transformer Neural Networks for Hate Speech Identification in Indo-European Languages. In Proceedings of the 11th annual meeting of the Forum for Information Retrieval Evaluation. [link]

Mishra, Sudhanshu, Shivangi Prasad, and Shubhanshu Mishra. 2021. Exploring Multi-Task Multi-Lingual Learning of Transformer Models for Hate Speech and Offensive Speech Identification in Social Media. SN COMPUT. SCI. [link]

PROJECTS

Falsification of Cyber-physical Systems using Deep Reinforcement Learning	Jan - April 2021
CS659 Course Project	

· Falsification of Simulink Models using Deep Reinforcement Learning
· Used Double DQN and A3C algorithms for Falsification from ChainerRL library.
· Used S-Taliro for robustness calculation.
· Re-implementation of Falsification of Cyber-physical Systems using Deep Reinforcement Learning paper by T. Akazaki et. al.

Parallelization of Lid Driven Cavity flow using OpenMP   Jan - April 2021
PHY690 Course Project

· Wrote Lid-Driven Cavity flow simulation in python and C++ for 2D and 3D case.
· Parallelized the Cavity flow simulation using OpenMP, OpenACC.
· Performed strong and weak scaling analysis for varying grids and processors

Simple baseline for citation context purpose and influence classification   June 2020
Joint Work with Shubhanshu Mishra

· Used Random Forests, Gradient Boosted Trees and Multi-Layered Perceptrons for identifying citation context.
· Achieved 2nd position in influence task and 3rd position in the purpose task
· Systems Paper Published for 8th International Workshop on mining scientific publications, 3C Shared Task.

AI-based Monitoring and Response System for Hospital Preparedness towards COVID-19 in Southeast Asia   April 2020 - June 2020
With IITK Consulting Group

· COVID-19 monitoring and response system to identify the surge in the volume of patients at hospitals and shortage of critical equipment like ventilators in South-east Asian countries
· Paper Published in HSYS 2020 Track of International Conference of Machine Learning 2020 Workshop.

Trolling, Aggression and Cyber-bullying Content Identification   March 2020 - April 2020
Joint work with Shivangi Prasad and Shubhanshu Mishra

· Used fine-tuning of multi-lingual transformer neural network with joint training training on different languages and joint labelling of multiple tasks. Trained Models available at huggingface.co/socialmediaie
· Our approach came 2nd and 4th in 2 sub-tasks and 3rd in 4 of the 6 sub-tasks.
· Code: github.com/socialmediaie/TRAC2020

Hate Speech Identification   June 2019 - May 2020
Joint work with Shubhanshu Mishra

· Used fine-tuning of multi-lingual transformer neural networks, multi-task models and Back Translation.
· Among the 8 shared tasks, our solution won the 1st place for 3 tasks. Additionally, it was within the top 5 for 7 of the 8 tasks, being within 1% of the best solution for 5 out of the 8 sub-tasks.
· Published in the Proceedings of the 11th annual meeting of the Forum for Information Retrieval Evaluation. Extension of this work has been submitted to "Springer Nature Computer Science" journal.
· Invited for an oral presentation at Forum for Information Retrieval Evaluation 2019
· Code: github.com/socialmediaie/HASOC2019

Open World Classification using Adversarial Auto-Encoders   May 2019 - July 2019
Summer Internship Project (SRFP) under the guidance of Prof. Nikhil R. Pal (ISI Kolkata)

· Worked on Open World Problem of handling data which does not belong to any known class of the classifier.

- Experimented with various types of Generative deep learning algorithms like Vanilla GAN, W-GAN and Adversarial Autoencoders to develop a method to detect open world samples using the MNIST dataset.
- Code: github.com/ghostktjMactavish/Adversarial-Autoencoders

Personal Audio
December 2018 - 2019
Research Project under the supervision of Prof. Rajesh M. Hegde

- Developing adaptive equalization methods to create acoustic contrast controlled personal audio zones.
- Implemented a generalized Kalman Filter for the estimation of channel response in dynamic scenarios and BACC approach for inverse filters.
- MATLAB code at : github.com/ghostktjMactavish/PersonalAudio

Piezoelectric Energy Harvesting
January 2020 - May 2020
Advanced Vibration Control ME756A

- Studied the vibrational energy harvesting techniques using piezoelectric devices.
- Submitted Term Paper analyzing mathematical aspects of piezoelectric energy harvesting.

SKILLS

Programming Languages	C, C++, Python, Java, MATLAB, Julia, Octave.
Libraries and Softwares	Tensorflow, Keras, Pytorch, Simulink, Fusion 360, SolidWorks, ROS, PyQT, LabView, ANSYS

RELEVANT COURSES

Vibration Control(ME354)*	Engineering Dynamics*	HPC and ML
Modern Control Systems	Finite Element Method*	Non-Linear Vibrations*
Numerical Methods*	Engineering Drawing (ME251)*	Machining Dynamics*
Autonomous Cyber-Physical Systems*	Computational Fluid Dynamics*	ML for Signal Processing*

*: Received Top Grade ($\mathbf{A}$) ^{o}: Ongoing

ONLINE COURSES

Machine Learning by Andrew Ng, Stanford University on Coursera. (Course Certificate)

Reinforcement Learning Specialization, University of Alberta, Alberta Machine Intelligence Institute on Coursera. (Course Certificate)

Sequence Models, Deeplearning.ai on Coursera (Course Certificate)

Deep Reinforcement Learning taught by Prof. David Silver (Audited Online)

EXTRA-CURRICULAR ACTIVITIES AND ACHIEVEMENTS

Senior Executive of Football Events in Intra-collegiate sports meet (Udghosh).	May 2019- July 2019
Company Coordinator Student Placement Office	2018 - 2019
Completed Athletics Summer Camp	May - June 2018
Awarded 1st prize in Science Hoax Competition by judges from HRI Allahabad	2015
Selected for attending Eastern European Machine Learning Summer School	2021
Attended HPC Workshop on Materials and Mechanics	2021