Subrat Kumar Swain

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Education

The University of Queensland - IIT Delhi — Brisbane - New Delhi

PhD in Machine Learning & Security(Prof. Dan Kim & Prof. Vireshwar Kumar), **CGPA 9/10** — Aug 2021 – Present

- **Courseworks**: Machine Learning, Meta Learning, Computer Vision, Network & System Security, Cyber-Physical Systems, Cryptography.

VSS University of Technology — Odisha, India

Bachelor of Technology in Computer Science, **CGPA 9.21/10** — Aug 2016 – Jul 2020

Work Experience

Product Engineer — Sep 2020 – Aug 2021

Cognizant Technology Solutions — Bengaluru, India

- Developed and integrated a Ticket Analysis Solution into Nexa, an AutoML platform, which generates plots for volumetric & multivariate analysis and arrival patterns of the issue tickets.

Machine Learning Engineer — Sep 2019 – Sep 2020

TaiyoAI Inc. — San Francisco, CA(Remote)

- Automated the hyper-parameter optimization of models by 80% using **Bayesian optimization**.
- Improved model evaluation by ranking 20+ competing machine learning models by implementing an evaluation leader board for various use cases.
- Improved & managed model deployment pipeline for 1000+ time series forecasting models using **Apache Airflow**

Undergraduate Research Assistant (Under *Prof. Bighnaraj Naik*) — Apr 2018 – Mar 2020

VSS University of Technology — Odisha, India

- Implemented a Deep Belief Network classifier by stacking multiple Restricted Boltzmann Machines and performed a comparative study on the classification power of the same based on Gibbs chain lengths in Gibbs sampling.

Research Publications

Swain, S., Kumar, V., Kim, D. D., & Bai, G. (2023). SPAT: Semantic-Preserving Adversarial Transformation for Perceptually Similar Adversarial Examples. *European Conference on Artificial Intelligence (ECAI23)*, https://doi.org/10.3233/FAIA230525

Mishra, M, Dash, P. B., Nayak, J., B., & **Swain, S.K.** (2020). Deep Learning and Wavelet Transform Integrated Approach for Short-term Solar PV Power Prediction. *Measurement*, https://doi.org/10.1016/j.measurement.2020.108250

Research Projects

Disentangling Symbols and Movements: Factor-VAE on NAR Dataset(Code & Report)

- Given a challenging few-shot visual analogical reasoning task whose input-output image pairs are related by a complex transformation (composed of primitives), the task was to disentangle the primitive transformations.
- Used Factor-VAE to disentangle the primitive transformations. Due to the lack of any well-defined metric to quantify disentanglement, we visually analysed our results using latent traversals.

Reading Noisy Captions Embedded in Images(Code & Report)

- Implemented Encoder-Decoder network to extract text from images. Images were encoded using ResNet-50, and the texts from the encoded images were extracted with attention using the LSTM cell.
- Attention was used to focus on the part of an image that contained the text. Used 'teacher forcing' for training, 'beam search' for prediction and 'BLEU score' for evaluation

Awards and Achievements

- I was an invited student speaker in the CSRC conference at the UQ
- Qualified for the Prime Minister's Research Fellows (PMRF) PhD fellowship in lateral entry scheme for cycle 9.
- Ranked All India **800** (**top 0.8%**) from 101922 students in Graduate Aptitude Test in Engineering (GATE) - CS-IT
- Selected as a part of SkyDeck, UC Berkeley Start-up Acceleration program as a ML Engineer for TaiyoAI
- Ranked All India **13,187** (**top 5%**) out of 200000 students in Joint Entrance Examination (JEE)– Advanced
- Out of few thousands of students, got selected for National Super 100, Delhi - free residential coaching for the coveted IIT entrance examinations founded by Director General of Police Abhyanand.
- Selected for national level visual art competition from Bhopal region as one of 50+ participants in class IX.
- Qualified JNVST (Navodaya) and funded by the Govt of India to pursue education from Standard 6 to 12.