Siba Smarak Panigrahi

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Education

B.Tech. in Computer Science and Engineering **2018–Present**
Indian Institute of Technology, Kharagpur, India *GPA: 9.73/10*
Department Rank **2** amongst graduating batch of CSE students.

All India Senior School Certificate Examination (AISSCE) **2018**
Kendriya Vidyalaya Sangathan (KVS), India *98.6%*
Secured AIR 3, Rank 1 in Bhubaneswar Region. Among the top 0.1% of the 1.16 million candidates.

Research Interests

Multi-modal Learning, Bias and Explainability, Applications of Deep Learning

Research Experience

Visual Grounding in Textual Entailment **IIT Kharagpur**
Bachelor's Dissertation | Supervisor(s): Prof. Abir Das, Dr. Rameswar Panda *Jan 2022 - ongoing*

Contextual Bias in Visual Recognition Models **IIT Kharagpur**
Supervisor(s): Prof. Abir Das, Dr. Rameswar Panda (MIT-IBM Watson AI Lab) *Apr 2021 - Dec 2021*
Evaluated mAP and used GradCAM with state-of-the-art computer vision models to quantitatively and qualitatively determine the contextual bias in images containing exclusive and co-occurring biased pairs. Proposed different biased models to inherently capture contextual bias and knowledge distillation approaches for automated bias mitigation.

Explanation Based Learning in Pretrained Language Models **INK-Lab, USC**
IUSSTF-Viterbi Intern | Supervisor: Prof. Xiang Ren *Jun 2021 - Sep 2021*
Worked on different attention-based regularization and knowledge-distillation techniques to analyze the effect of explanations generated using gradient-based saliency methods in the performance of Pre-trained Language Models.

Improving Digital Marketing with Topological Data Analysis **Adobe Research, India**
Research Intern | Supervisor(s): Iftikhar Ahamath Burhanuddin, Gautam Choudhary, & Manoj Kilaru *May-Jul 2021*
Implemented Topological Regularization in LSTM Encoder-Decoder architecture to leverage the topological information from customer navigation patterns and obtain sessions' latent representation. Proposed a new metric to identify best session clustering and provided fine-grained cluster insights to improve digital marketing workflow.

Emotion Recognition using EEG Signals **Bennett University, India**
Research Intern | Supervisor(s): Prof. Arpit Bhardwaj, & Divya Acharya *Jul 2020–Aug 2020*
Carried literature reviews of recent papers to understand the basics of Genetic Programming and Multi-Task Cascaded Networks. Designed CNN-based and LSTM-based architectures to obtain **87.72%** and **88.6%** mean accuracy, respectively, for classification of EEG signals into valence, arousal, liking, and dominance.

Publications

[2] **Leveraging Pre-trained Language Models for Key Point Matching** (Paper | Code)
M. N. Kapadnis*, S. Patnaik*, **S. S. Panigrahi***, V. Madhavan*, A. Nandy
EMNLP Workshop - Workshop on Argument Mining, 2021.

[1] **Multi-class Emotion Classification Using EEG Signals** (Paper | Code)
D. Acharya, R. Jain, **S. S. Panigrahi**, R. Sahni, S. Jain, S. P. Deshmukh, A. Bhardwaj
International Advance Computing Conference (IACC), 2020.

Key Projects

Reproducibility Challenge **IIT Kharagpur**
Reinforcement Learning Term Project *Sep 2021 - Feb 2022*
Submitted to *ML Reproducibility Challenge, 2021*. Details omitted since the work is under review.

SemEval 2021 Task 11: NLPContributionGraph **IIT Kharagpur**
NLP Term Project | Course Instructor: Prof. Pawan Goyal *Apr 2021*
Designed, implemented, and fine-tuned various BERT-based models to classify sentences as contribution sentences or not. Achieved the highest F1-score of 0.3101 in the post-competition phase on the date of submission. (Code)

Study of Facebook posts during Elections **MIT, USA**
Data Analytics Intern | Supervisor(s): Dr. Kiran Garimella (IDSS, MIT)
Prof. Aaditya Dar (ISB), & Vasundhara Sirnate (The Polis Project) *Dec 2020*
Designed a complete framework to simplify the study of Facebook posts during elections. Analyzed page characteristics and post reactions from various politics-related Facebook pages and their correlation with election results. Trained simple classification pipelines for assigning most influenced political party to a post. (Code)

COVID-19 detection using Chest X-rays **Effat University, Saudi Arabia**
Summer Intern | Supervisor: Prof. Abdulhamit Subasi *Jun 2020–Aug 2020*
Designed architectures of 2 and 3 layered CNNs to obtain accuracy around **95%** for classification of X-Ray images into Normal, COVID-19, or Pneumonia. Combined Machine Learning algorithms and CNN architectures pre-trained on ImageNet to enhance the above accuracy to more than **96.5%**. (Code)

Academic Achievements & Honors

- **PROSE, Microsoft Research** (winter research intern) (Jan - Jun 2022)
- **Research Week with Google (Computer Vision track)** (1 of 150 selected students) (2022)
- **Prof. J.C. Ghosh Memorial Endowment Prize** (highest CGPA after semester VI) (2021)
- **Indo-US Science and Technology Forum (IUSSTF)** - **Viterbi** Award (1 of 15 awardees) (2021)
- **DAAD-WISE scholarship**, **University of Freiburg** (declined) (2021)
- **Inter IIT Tech Meet 9.0** (Bronze-winning contingent of IIT Kharagpur) (2021)
- **Open IIT Maths Olympiad** (Team event; 1st position, Gold Medal) (2019)
- **Technology Alumni Association (Delhi Chapter) Award** (highest CGPA after semester II) (2019)
- **Jagadis Bose National Science Talent Search Examination** (Rank 2 of 173 awardees) (2018)
- **Kishore Vaigyanik Protsahan Yojana** (All India Rank 828) (2017)
- **KVS Junior Mathematical Olympiad** (Rank 6 in India; Rank 1 in Bhubaneswar region) (2016)
- **Regional Mathematical Olympiad** (Rank 2 in state) (2016)
- **Exchange Student, Sakura Exchange Program in Science** (1 of 90 selected students) (2016)

Relevant Coursework

Mathematics - Linear Algebra, Calculus, Probability and Statistics
Ongoing - Information Retrieval, Principles of Programming Languages
Computer Science - Reinforcement Learning, Deep Learning, Natural Language Processing, Machine Learning, Computer Networks*, Operating Systems*, Algorithms - I* & II, Cryptography & Network Security, Theory of Computation, Discrete Structures, Computer Organization and Architecture*, Compilers*, Switching Circuits and Logic Design*, Software Engineering* (* includes lab component)

Skills

- **Programming Languages** - Python, C, Java, LaTeX, Verilog, MIPS
- **Libraries** - PyTorch, PyTorch Lightning, Keras, Git, Huggingface, Timm, Neptune, Hydra, Captum
- **Web Development** - Django, HTML, CSS, Bootstrap, PostgreSQL

Activities and Leadership

Advisor, Kharagpur Data Analytics Group, IIT Kharagur (Website | Reading-sessions)
Advisor, Institute Wellness Group, IIT Kharagur (Facebook)

Professional Services

- Volunteering: EMNLP 2021