Siba Smarak Panigrahi

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Education

B.Tech. in Computer Science and Engineering **2018–Present**
Indian Institute of Technology, Kharagpur, India *GPA: 9.80/10*
Department Rank **1** amongst 121 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

Bias and Explainability, Computer Vision, Deep Learning

Research Experience

Bias in Vision Models **IIT Kharagpur**
Bachelor's Dissertation | Supervisor(s): Prof. Abir Das (IIT Kharagpur),
Dr. Rameswar Panda (MIT-IBM Watson AI Lab) *April 2021 - Ongoing*
Used mAP and GradCAM with state-of-the-art vision models to quantitatively and qualitatively determine the bias in images containing exclusive and co-occuring biased pairs. Designing bias mitigation strategies to improve the performance of biased models.

Explanation Based Learning in Pretrained Language Models **INK-Lab, USC**
IUSSTF-Viterbi Intern | Supervisor: Prof. Xiang Ren *June 2021 - Ongoing*
Worked on different attention-based regularization, and knowledge-distillation techniques to analyze the effect of explanations generated using different techniques 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-July 2021*
Implemented Topological Regularization in LSTM Encoder-Decoder architecture to leverage the topological information from customer navigation patterns. Used above obtained sessions' latent representations for session clustering and providing 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 learn basics of Genetic Programming, and Multi-Task Cascaded Networks. Designed CNN and LSTM architectures to respectively obtain **87.72%** and **88.6%** mean accuracy for classification of EEG signals into valence, arousal, liking, and dominance emotions.

Key Projects

SemEval 2021 Task 11: NLPContributionGraph **IIT Kharagpur**
NLP Term Project | Course Instructor: Prof. Pawan Goyal *Apr 2021*
Designed, implementated and fine-tuned various BERT-based models for classification of sentences as contribution sentences or not. Achieved the highest F1-score of 0.3101 in Post-competition phase on submission date. (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 enhance and simplify the study of Facebook posts during elections. Analyzed distribution of page characteristics and post reactions, released by different FB pages, and their correlation with election results. Trained simple pipelines to assign a 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 ImageNet pre-trained architectures to enhance the above accuracy to more than **96.5%**. (Code)

Write Your Thoughts **IIT Kharagpur**
Software Engineering Lab Term Project | Course Instructor: Prof. Sudip Misra *May 2020*
Created a web platform on the Django framework for literary enthusiasts' to share their stories, poems, and thoughts. Incorporated commenting and rating on a work; allowed subscribing to and ranking of authors. (Code)

Academic Achievements

- Selected for **IUSSTF-Viterbi program** (2021)
- Selected to receive **DAAD-WISE scholarship** for a summer research internship at the **University of Freiburg** (rescinded) (2021)
- Member of Bronze-winning **Inter IIT Tech Meet 9.0** contingent of IIT Kharagpur (2021)
- Qualified campus round in **Smart India Hackathon, Software Edition**, and bagged position amongst top 5 teams of the institute (2020)
- Awarded Gold Medal for securing **1st** position in Open IIT Maths Olympiad (2019)
- Awarded with **Technology Alumni Association (Delhi Chapter) Award**, for securing highest CGPA at end of semester II amongst all B.Tech/Dual Degree students (2019)
- Secured **2nd** rank in JBNSTS (Jagadis Bose National Science Talent Search) Examination (2018)
- Secured **All India Rank 828** in the KVPY examination (2017)
- Invited as **Guest of Hon'ble Prime Minister of India** to witness Republic Day Parade from Prime Minister's Box for excellent performance in AISSE (2017)
- Ranked **6th** in India and **1st** in region in KVS-JMO (Junior Mathematical Olympiad) (2016)
- Ranked **2nd** in Odisha state RMO (Region Mathematical Olympiad) (2016)
- Selected as **Exchange Student** under **Sakura Exchange Program in Science**, Japan Science and Technology Agency; total 90 students from India including 35 from KVS (2016)

Relevant Coursework

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

Skills

- **Coding** - Python, C, Java, LaTeX, Octave, Verilog, MIPS
- **Other** - PyTorch, PyTorch Lightning, Keras, Git, Neptune, Hydra, Captum, Scikit-Learn, Numpy
- **Web Devt.** - Django, HTML, CSS, Bootstrap, PostgreSQL

Activities and Leadership

Advisor (current), Head(Dec '20 - Jun '21) **IIT Kharagpur**

Kharagpur Data Analytics Group (KDAG)

Organized research paper-reading sessions for students of IIT Kharagpur (GitHub). Conducted Data Science and ML workshop for more than 600 registered students. The KDAG is a group of students enthusiastic about Data Science and Machine Learning, along with its applications.

Team Leader (Geometry and Topology Team) **IIT Kharagpur**

Theoretical Mathematics Reading Group (TMRG)

Taught and attended sessions on Basic Topology, Graph Algorithms, Number Theory, and Matrix Algebra. The TMRG is a reading group under UG Students' Council, IIT Kharagpur to develop interest amongst students towards research in Computer Science and Mathematics.

Advisor (current), Head(Aug '20 - Jun '21) **IIT Kharagpur**

Institute Wellness Group (IWG)

Guided web development team to design a website to spread awareness about our activities. Planned refresher events, month-long mental-health awareness drives, and Gatekeeper training programs. IWG is a friendly neighborhood wellness body of the campus, responsible for organizing events that helps to aware students about mental health issues and methods to combat them.

Publications

[1] Divya Acharya, Riddhi Jain, **Siba Smarak Panigrahi**, Rahul Sahni, Siddhi Jain, Sanika Prashant Deshmukh, and Arpit Bhardwaj. Multi-class Emotion Classification Using EEG Signals. In Proceedings of the 10th International Advance Computing Conference (IACC), 2020. (Paper|Code)

[2] Manav Nitin Kapadnis*, Sohan Patnaik*, **Siba Smarak Panigrahi***, Varun Madhavan*, Abhilash Nandy. Leveraging Pre-trained Language Models for Key Point Matching. In the 8th workshop on Argument Mining at Empirical Methods in Natural Language Processing (EMNLP) 2021 (Submitted in Aug 2021)