Siba Smarak Panigrahi

📱 +91 9439440550 • ✉ sibasmarak.p@gmail.com • 🌐 sibasmarak.github.io

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)   *Apr 2021 - Ongoing*
Evaluated mAP and used GradCAM with state-of-the-art vision models (convolution, attention, and transformer based) to quantitatively and qualitatively determine the bias in images containing exclusive and co-occuring biased pairs. Designing bias mitigation strategies to reduce captured bias as well as improve the performance of biased vision models.

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 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 emotions.

Key Projects

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 for classification of sentences as contribution sentences or not. Achieved the highest F1-score of 0.3101 in Post-competition phase on 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 distribution of 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)

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 in the **Indo-US Science and Technology Forum (IUSSTF) - Viterbi** program   (2021)
- Selected to receive **DAAD-WISE scholarship** for a summer research internship at
  the **University of Freiburg** (declined)   (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**   (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 (Kishore Vaigyanik Protsahan Yojana) 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 (All India Secondary School Examination) (2017)
- Ranked **6th** in India and **1st** in Bhubaneswar in KVS-JMO (Junior 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 Systems*, Algorithms - I* & II, Formal Language and Automata Theory, Compilers*, Computer Organization and Architecture*, 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 (current), Head (Dec 2020 - Jun 2021)   **IIT Kharagpur**
Kharagpur Data Analytics Group (KDAG)
Initiated and organized open to all research paper-reading sessions (GitHub). Conducted Data Science and ML workshop for more than 600 registered students; taught Support Vector Machines and provided additional resources.

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 under UG Students' Council aims to develop interest in students towards research in Computer Science and Mathematics.

Advisor (current), Head (Aug 2020 - Jun 2021)   **IIT Kharagpur**
Institute Wellness Group (IWG)
Guided web development team to design a website to spread awareness about activities and events organized by IWG. Planned campus-wide refresher events, month-long mental-health awareness drives, and Gatekeeper training programs. IWG is a wellness body of the campus, to aware students about mental health issues and methods to combat them.

Publications

[1] 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 (Paper|Code)

[2] 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)