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

Applications of deep learning, Bias and Explainability, Computer Vision, Multi-modal Learning

Research Experience

Contextual Bias in Visual Recognition Models **IIT Kharagpur**
Bachelor's Dissertation | Supervisor(s): Prof. Abir Das (IIT Kharagpur), Dr. Rameswar Panda (MIT-IBM Watson AI Lab) *Apr 2021 - Current*
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 utilized 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

[1] **(EMNLP 2021)** Manav Nitin Kapadnis*, Sohan Patnaik*, **Siba Smarak Panigrahi***, Varun Madhavan*, Abhilash Nandy. Leveraging Pre-trained Language Models for Key Point Matching. In Proceedings of the 8th Workshop on Argument Mining, (Punta Cana, Dominican Republic, 7-11 Nov. 2021) , Association for Computational Linguistics, pp. 200–205 (Paper|Code)

[2] **(IACC 2020)** 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 Advanced Computing (Singapore, 11 Feb. 2021), D. Garg, K. Wong, J. Sarangapani, and S. K. Gupta, Eds., Springer Singapore, pp. 474–491. (Paper|Code)

Key Projects

Reproducibility Challenge: Value Alignment Verification **IIT Kharagpur**
RL Term Project | Course Instructor: Prof. Abir Das *Sep 2021 - Ongoing*
Re-implemented the ideas proposed in the paper (link) to design questions to verify the alignment of an agent with a human reward function in explicit and implicit reward settings. Participating in Reproducibility Challenge 2021.

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

- Part of **technical (coding) team** (at IIT Kharagpur) responsible for organizing **JEE (Advanced)** (2021)
- Selected in the **Indo-US Science and Technology Forum (IUSSTF)** - **Viterbi** program (2021)
- Selected to receive **DAAD-WISE scholarship** to intern at the **University of Freiburg** (declined) (2021)
- Member of Bronze-winning **Inter IIT Tech Meet 9.0** contingent of IIT Kharagpur (2021)
- 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 the 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 the 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)
- 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
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 (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.

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.

Professional Services

- Volunteering: EMNLP 2021