

# Siba Smarak Panigrahi

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## Education

### B.Tech. in Computer Science and Engineering

Indian Institute of Technology, Kharagpur, India

Department Rank 1 amongst 121 students.

2018–Present

GPA: 9.80/10

### All India Senior School Certificate Examination (AISSCE)

Kendriya Vidyalaya Sangathan (KVS), India

Secured AIR 3, Rank 1 in Bhubaneswar Region. Among the top 0.1% of the 1.16 million candidates.

2018

98.6%

## Research Interests

Bias and Explainability, Computer Vision, Natural Language Processing, 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 - Current

Evaluated mAP and used GradCAM with state-of-the-art computer vision models to quantitatively and qualitatively determine the 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. (Filed for a patent)

### 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.

## 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](#))

## 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](#) to design questions in order to verify alignment of an agent with a human reward function in both 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 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](#))

## Academic Achievements & Honors

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- 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 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)
- Ranked **6th** in India and **1st** in Bhubaneswar in KVS-JMO (Junior Mathematical Olympiad) (2016)
- Ranked **2nd** in Odisha state RMO (Regional 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

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**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

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- **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

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**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

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- Volunteering: EMNLP 2021