

Siba Smarak Panigrahi

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Education

M.Sc. (Thesis) in Computer Science <i>McGill University and Mila, Montréal, Canada (Supervisor: Siamak Ravanbakhsh)</i>	2022–Ongiong GPA: 4.0/4.0
B.Tech. in Computer Science and Engineering <i>Indian Institute of Technology, Kharagpur, India</i> Department Rank 2 in graduating batch of CSE students (Supervisor: Abir Das, Rameswar Panda).	2018–2022 GPA: 9.73/10
All India Senior School Certificate Examination (AISSCE) <i>Kendriya Vidyalaya Sangathan (KVS), India</i> Secured AIR 3, Rank 1 in Bhubaneswar Region. Among the top 0.1% of the 1.16 million candidates.	2018 98.6%

Research Interests

Representation Learning (using symmetry, on graphs and images), Reinforcement Learning, Generative Models

Research Experience

Equivariant embedding functions for Graph Representation <i>Supervisor: Siamak Ravanbakhsh</i>	Mila and McGill University Nov 2022 - Ongoing
Designing equivariant graph encoders by regularizing latent space with a loss to preserve euclidean distances of graph embeddings before and after transformation (such as addition or removal of edges, modification to graph spectrum).	
Visual Grounding in Textual Entailment <i>Bachelor's Dissertation Supervisor(s): Prof. Abir Das, Dr. Rameswar Panda</i>	IIT Kharagpur Jan 2022 - May 2022
Investigated the effect of simultaneously and individually visual grounding the premise and hypothesis in NLI task. Trained various BERT configurations by leveraging high-level feature representations of image from ResNet-50 and CLIP.	
Contextual Bias in Visual Recognition Models <i>Supervisor(s): Prof. Abir Das, Dr. Rameswar Panda (MIT-IBM Watson AI Lab)</i>	IIT Kharagpur 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 <i>IUSSTF-Viterbi Intern Supervisor: Prof. Xiang Ren</i>	INK-Lab, USC 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 <i>Research Intern Supervisor: Iftikhar Ahamath Burhanuddin</i>	Adobe Research, India May 2021 - Jul 2021
Implemented Topological Regularization in LSTM Encoder-Decoder architecture to leverage the topological information from customer navigation patterns and obtain sessions' better latent representation to provide insights on sessions.	
Emotion Recognition using EEG Signals <i>Research Intern Supervisor(s): Prof. Arpit Bhardwaj, & Divya Acharya</i>	Bennett University, India 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

[4] 1 submission under review at **ICML 2023**

[3] **[Re]: Value Alignment Verification** ([Paper](#) | [Code](#))

S. S. Panigrahi*, S. Patnaik*

ML Reproducibility Challenge (MLRC) 2021; NeurIPS 2022 Spotlight and Journal Showcase Track.

- [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. Sahnii, S. Jain, S. P. Deshmukh, A. Bhardwaj
International Advance Computing Conference (IACC), 2020.

Key Projects

Crystal Symmetry aware framework for Material Generation **McGill University and Mila**
GGM Course Project | Instructor: Joey Bose and Prakash Panangaden

Implemented equivariant message-passing and knowledge distillation in complex graph encoders (such as [DimeNet](#)) to incorporate crystal symmetry (Bravais lattice) information in [CDVAE](#) framework for material generation.

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)*

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 the most influenced political party to a post. ([Code](#))

Academic Achievements & Honors

- **Oxford ML Summer School (OxML)** (Healthcare track) (2023)
- **Jamsetji Nusserwanji Tata (JN Tata) Scholar** (endowment for higher studies) (2022)
- **Eastern European Machine Learning (EEML) Summer School** (selected for poster presentation) (2022)
- **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)
- **Guest of the Hon'ble Prime Minister of India** to witness Republic Day Parade (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 - Causal Inference and ML, Probabilistic Graphical Models

Computer Science - Geometry and Generative Models (GGM), Network Science, Deep Learning, Machine Learning, Reinforcement Learning, Natural Language Processing (NLP), Information Retrieval, Principles of Programming Languages, Computer Networks*, Operating Systems*, Algorithms - I* & II, Cryptography & Network Security, Theory of Computation, Compilers*, Software Engineering* (* includes lab component)

Skills

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

Activities and Leadership

Member, Mental Health Committee, Mila

Advisor, Kharagpur Data Analytics Group (KDAG), IIT Kharagpur ([Reading-sessions](#))

Advisor, Institute Wellness Group, IIT Kharagpur ([Facebook](#))

Professional Services

- **Organizing:** Molecular ML Conference (MoML) 2023
- **Volunteering:** [DNetCV 2022](#) (CVPR-W), EMNLP 2021
- **Reviewer:** MLRC 2022, DNetCV 2022 (CVPR-W)
- **Posters/Talks:**
 - NeurIPS 2022 Journal Showcase Track (and Spotlight lightning talks) (Poster & [Talk](#), 2022)
 - 50th Anniversary of School of Computer Science, McGill University (Poster, 2022)
 - KDAG Winter Workshop, lecture on Support Vector Machines ([Talk](#), 2020)