Siba Smarak Panigrahi

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Education

M.Sc. (Thesis) in Computer Science **2022–Ongiong**
McGill University and Mila, Montréal, Canada (Supervisor: Siamak Ravanbakhsh)

B.Tech. in Computer Science and Engineering **2018–2022**
Indian Institute of Technology, Kharagpur, India *GPA: 9.73/10*
Department Rank **2** in graduating batch of CSE students (Supervisor: Abir Das, Rameswar Panda).

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

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

Research Experience

Visual Grounding in Textual Entailment **IIT Kharagpur**
Bachelor's Dissertation | Supervisor(s): Prof. Abir Das, Dr. Rameswar Panda *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 **IIT Kharagpur**
Supervisor(s): Prof. Abir Das, Dr. Rameswar Panda (MIT-IBM Watson AI Lab) *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 **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 2021 - 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

[3] **[Re]: Value Alignment Verification** (Paper | Code)
S. S. Panigrahi*, S. Patnaik*
ML Reproducibility Challenge 2021; NeurIPS 2022 Journal Showcase Track; NeurIPS 2022 Spotlight.

[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. Sahni, 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 *Oct 2022 - Ongoing*
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 better material generation. (Code)

Equivariant embedding functions for Graph Representation **McGill University and Mila**
Network Science Course Project | Instructor: Reihaneh Rabbany *Oct 2022 - Ongoing*
Designed 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). (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)

Academic Achievements & Honors

- **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)
- **Exchange Student, Sakura Exchange Program in Science** (1 of 90 selected students) (2016)

Relevant Coursework

Mathematics - Linear Algebra, Calculus, Probability and Statistics
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, Keras, Git, Huggingface, Timm, Hydra
- **Web Development** - Django, HTML, CSS, Bootstrap, PostgreSQL

Activities and Leadership

Advisor, Kharagpur Data Analytics Group, IIT Kharagpur (Reading-sessions)
Advisor, Institute Wellness Group, IIT Kharagpur (Facebook)

Professional Services

- Volunteering: EMNLP 2021, DNetCV 2022 (CVPR-W)
- Reviewer: DNetCV 2022 (CVPR-W)
- Posters/Talks: NeurIPS 2022 Journal Showcase Track (and Lightning Talks)