Aishik Mandal

(+49) 15258588061 • aishik.mandal@tu-darmstadt.de • jitaishik.github.io
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Education

- **Technical University of Darmstadt**
  PhD in Computer Science, *2023-*
- **Indian Institute of Technology, Kharagpur** **CGPA: 9.61/10**
  Bachelor of Technology in Electronics and Electrical Communication Engineering, *2018-2023*
  Master of Technology in Artificial Intelligence, Machine Learning and Applications
  Minor in Computer Science and Engineering
  Micro Specialisation in Embedded Control, Software, Modelling and Design

Internships

- **Multimodal Turn Taking in Conversational Agents** **INRIA Paris, France**
  Research Intern at Articulabo, Cognitive Machine Learning Group under Prof. Justine Cassell, *May 2022-Dec 2022*
- **Revenue Function of Hierarchical Clustering in Comparison Framework** **TU Munich, Germany**
  Research Intern at Theoretical Foundations of AI under Prof. Debarghya Ghoshdastidar *Jun 2021-Aug 2021*

Thesis

- **Universal Transformer for Multimodal Self-supervised Learning** **IIT Kharagpur**
  Master's Thesis, under Prof. Jiaul Hoque Paik, Centre of Excellence in AI(CoEAI) *Aug 2022-Apr 2023*
  - Proposed a **novel loss function** to train a transformer which can **encode images and texts in a shared embedding space**.
  - **Trained a vanilla transformer encoder** from scratch with the proposed loss function on CoCo image captpioning dataset.
  - **Evaluated** the performance of the Universal Transformer in **multimodal and single modality situations**.
  - Conducted **error analysis** and suggested **adversarial training** to achieve improvements.
- **Discourse Mutual Information for Dialogue Understanding and Response Generation** **IIT Kharagpur**
  Bachelor's Thesis, under Prof. Pawan Goyal, Department of Computer Science and Engineering *Dec 2020-Apr 2021*
  - Performed extensive experimentation on a transformer based dual encoder architecture to encode context and response in a dialog, with the purpose of increasing the proposed **Discourse Mutual Information** objective function.
  - Performed various downstream **dialog-understanding tasks** as a means of evaluating the representations learned.
  - Achieved an accuracy improvement of upto **5.8%** on **dialog classification tasks** and upto **15.3%** on **dialog evaluation tasks** over state of the art baselines while performing at par with the baselines on response selection tasks.
  - Designed and trained a **decoder** to obtain responses from response encoding and proposed **algorithms** to map context encoding to response encoding.
  - Performed **exploratory analysis** to understand the **features captured** by the encoder.

Publications

- **Towards Privacy-aware Mental Health AI Models: Advances, Challenges, and Opportunities**
  Aishik Mandal, Tanmoy Chakraborty, Iryna Gurevych, *preprint* (Link to the paper)
- **Enhancing Depression Detection via Question-wise Modality Fusion**
  Aishik Mandal, Dana Atzil-Slonim, Thamar Solorio, Iryna Gurevych, *Oral, Workshop on Computational Linguistics and Clinical Psychology (CLPsych 2025)* (Link to the paper)(Code-base Link)
- **CVQA: Culturally-diverse Multilingual Visual Question Answering Benchmark**
  David Orlando Romero Mogrovejo, Chenyang Lyu, Haryo Akbarianto Wibowo, Santiago Góngora, **Aishik Mandal**,..,Thamar Solorio, Alham Fikri Aji, *Oral, Neural Information Processing Systems Datasets and Benchmarks Track (NEURIPS 2024)* (Link to the paper)
- **A Revenue Function for Comparison-Based Hierarchical Clustering**

Aishik Mandal, Michaël Perrot, Debarghya Ghoshdastidar, *Transactions on Machine Learning Research (TMLR, March 2023)* (Link to the paper)(Code-base Link)

- **Representation Learning for Conversational Data using Discourse Mutual Information Maximization**
  Bishal Santra, Sumegh Roychowdhury, **Aishik Mandal**, Vasu Gurram, Atharva Naik, Manish Gupta, Pawan Goyal, *2022 Annual Conference of the North American Chapter of the Association for Computational Linguistics (NAACL 2022)* (Link to the paper) (Link to project webpage)
- **Knowledge-Aware Neural Networks for Medical Forum Question Classification**
  Soumyadeep Roy, Sudip Chakraborty, **Aishik Mandal**, Gunjan Balde, Prakhar Sharma, Anandhavelu Natrajan, Megha Khosla, Shamik Sural, Niloy Ganguly, *30th ACM International Conference on Information and Knowledge Management (CIKM 2021)* (Link to the paper) (Code-base Link)

Skills and Expertise

- **Programming Languages and Softwares:** Python / C++ / C / MATLAB / OpenSmile / OpenFace / Elan
- **Libraries:** PyTorch / TensorFlow / Keras / ScikitLearn / Pandas / NumPy

Student Supervision

- **Masters Thesis, TU Darmstadt**
  - Mateusz Ciesielski (Apr 2025-Present): Predicting Personality Domains: A Multimodal Approach
  - Paulina Kuczykowska (Sep 2023-Feb 2024): Predicting Depression Severity from Therapy Dialogues

Teaching

- **Teaching Assistant**, *TU Darmstadt(2025)*: Ethics for Natural Language Processing.
- **Teaching Assistant**, *TU Darmstadt(2024)*: Ethics for Natural Language Processing.
- **Teaching Assistant**, *IIT Kharagpur(2023)*: Big Data Processing.

Reviewing

- Transactions on Machine Learning Research (TMLR)

Awards And Achievements

- **Silver Medalist:** Received Silver Medal for holding department rank 1 in Electronics and Electrical Communication Engineering at IIT Kharagpur (2023).
- **DAAD WISE Awardee:** Received WISE scholarship for summer internship at TU Munich (2021).
- **Charpak Lab Scholarship Awardee:** Received Charpak Lab scholarship for summer internship at INRIA (2022).
- **GKF International Internship Scholarship:** Received Guru Krupa IITKGP Foundation Scholarship from IITKGP Foundation for summer internship at INRIA (2022).

Conferences

- **CLPsych Workshop**, *NAACL 2025*
- **Google Research Week**, *Google Research India(2023)*