

Aishik Mandal

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Education

- **Technical University of Darmstadt**
 - *ELLIS PhD Program Doctoral Candidate in Computer Science*, Sep 2023- Dec 2026
Research: Privacy-Preserving High-Fidelity Synthetic Therapy Session Generation.
Advisors: Prof. Iryna Gurevych, Prof. Aurélien Bellet, Prof. Tanmoy Chakraborty
 - **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

Skills and Expertise

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

Internships

- **Privacy-aware Synthetic Therapy Session Generation** **INRIA Montpellier, France**
 - *Visiting Researcher at [Premedical Lab](#) under Prof. Aurélien Bellet* Oct 2025-Mar 2026
 - Analyzed the **privacy-utility trade-off** in synthetic therapy generation using client profiles and symptoms.
 - Showed that using client profiles increase privacy leakage by **+51.3% attribute leakage, +8% linkage, +9% MIA attack accuracy** over using only symptoms, but improve the diversity of the generated sessions.
- **Multimodal Turn Taking in Conversational Agents** **INRIA Paris, France**
 - *Research Intern at [Articulabo, Cognitive Machine Learning Group](#) under Prof. Justine Cassell* May 2022-Jul 2022
 - Developed a **multimodal turn-taking predictor** for conversational agents using **LSTMs, attention mechanisms, and a pre-trained transformer** to jointly model audio, visual, and text signals.
 - Achieved a **macro F1 score improvement of +0.09** (max: 1) over **state-of-the-art models**.
- **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
 - Introduced the **first framework to evaluate hierarchical clustering using comparisons**, with a **novel revenue function** that avoids reliance on pairwise similarities or ground-truth trees.
 - Developed **two novel variants of average linkage clustering** that operate directly on comparisons.
 - Achieved **high rank correlations of +0.9** (max: 1) with standard clustering quality metrics.

Thesis

- **Privacy-Preserving High-Fidelity Synthetic Therapy Session Generation** **TU Darmstadt**
 - *PhD Thesis, under Prof. Iryna Gurevych, [Ubiquitous Knowledge Processing \(UKP\) Lab](#)* Sep 2023-Dec 2026
 - Proposed a novel multi-agent LLM framework for generating synthetic therapy sessions, achieving **3.8% improvement on standard scales** and **77.2% preference from human experts** across 9 aspects over state-of-the-art datasets.
 - Developed a **Client Psychological Graph-based synthetic session generation framework**, experimenting with **CoT and multi-agent feedback** prompting, achieving an **average rank of 1.6/4 over state-of-the-art baselines** in expert evaluation.
 - Achieved a **utility improvement of 4.3% on a counseling benchmark over state-of-the-art baselines** with no safety degradation using Llama3-8B fine-tuned on the generated dataset.
- **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 crossmodal contrastive loss** to train a 12-layer transformer for image-text embeddings on COCO.
 - Achieved **competitive performance with Sentence Transformers** in text-only tasks.
 - Conducted **error analysis**, identifying the **need for hard negatives** for improved adversarial training.
- **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

- Proposed a **novel discourse mutual information loss** for a **transformer-based dual encoder**. Additionally trained a **decoder** and proposed a mapping algorithm from context to response embeddings.
- Achieved average improvement of **+4.1% on dialogue classification tasks** and **+10.6% on dialogue evaluation tasks over state-of-the-art baselines**, while maintaining competitive performance on response selection tasks.
- Conducted **exploratory analysis using K-means clustering, KNN, and t-SNE** to interpret the encoder's learned representations.

Publications

- **Graph2Counsel: Clinically Grounded Synthetic Counseling Dialogue Generation from Client Psychological Graphs**, *preprint* ([Paper](#)) ([Code](#)) ([Data & Model](#))
Aishik Mandal, Hiba Arnaout, Clarissa W. Ong, Juliet Bockhorst, Kate Sheehan, Rachael Moldow, Tanmoy Chakraborty, Iryna Gurevych
- **SPEAK-SAFE: Secure Processing of Electronic Audio for Knowledge in Suicide Assessment from Therapeutic Exchanges**, *Frontiers in Digital Health 2026* ([Paper](#))
Christopher Landau, Patricia Getty, Caroline Gruler, Rebekka Stadje, Sofia Arampatzi, **Aishik Mandal**, Anmol Goel, Iryna Gurevych, Andreas Reif, Oliver Grimm
- **MAGneT: Coordinated Multi-Agent Generation of Synthetic Multi-Turn Mental Health Counseling Sessions**, *preprint* ([Paper](#)) ([Code](#)) ([Data & Model](#))
Aishik Mandal, Tanmoy Chakraborty, Iryna Gurevych
- **A Comprehensive Survey of Datasets for Clinical Mental Health AI Systems**, *preprint* ([Paper](#))
Aishik Mandal, Prottay Kumar Adhikary, Hiba Arnaout, Iryna Gurevych, Tanmoy Chakraborty
- **Towards Privacy-aware Mental Health AI Models: Advances, Challenges, and Opportunities**, *Nature Computational Science* ([Paper](#))
Aishik Mandal, Tanmoy Chakraborty, Iryna Gurevych
- **CaMMT: Benchmarking Culturally Aware Multimodal Machine Translation**, *Findings EMNLP 2025* ([Paper](#))
Emilio Villa-Cueva, Sholpan Bolatzhanova, Diana Turmakhan, Kareem Elzeky, ..., **Aishik Mandal**,..., Tamar Solorio
- **Enhancing Depression Detection via Question-wise Modality Fusion**, *Oral, CLPsych 2025* ([Paper](#)) ([Code](#))
Aishik Mandal, Dana Atzil-Slonim, Tamar Solorio, Iryna Gurevych
- **CVQA: Culturally-diverse Multilingual Visual Question Answering Benchmark**, *Oral, NEURIPS 2024* ([Paper](#))
David Orlando Romero Mogrovejo, Chenyang Lyu, Haryo Akbarianto Wibowo, Santiago Góngora, **Aishik Mandal**,..., Tamar Solorio, Alham Fikri Aji
- **A Revenue Function for Comparison-Based Hierarchical Clustering**, *TMLR, March 2023* ([Paper](#)) ([Code](#))
Aishik Mandal, Michaël Perrot, Debarghya Ghoshdastidar
- **Representation Learning for Conversational Data using Discourse Mutual Information Maximization**, *NAACL 2022* ([Paper](#))
Bishal Santra, Sumegh Roychowdhury, **Aishik Mandal**, Vasu Gurram, Atharva Naik, Manish Gupta, Pawan Goyal
- **Knowledge-Aware Neural Networks for Medical Forum Question Classification**, *CIKM 2021* ([Paper](#)) ([Code](#))
Soumyadeep Roy, Sudip Chakraborty, **Aishik Mandal**, Gunjan Balde, Prakhar Sharma, Anandhavelu Natrajan, Megha Khosla, Shamik Sural, Niloy Ganguly

Teaching and Supervision

- **Masters Thesis Supervision, TU Darmstadt**
 - Mateusz Ciesielski (Apr 2025-Oct 2025): Predicting Personality Domains: A Multimodal Approach.
 - Paulina Kuczykowska (Sep 2023-Feb 2024): Predicting Depression Severity from Therapy Dialogues.
- **Teaching Assistant, TU Darmstadt (2024-2026)**: Ethics for Natural Language Processing.
- **Teaching Assistant, IIT Kharagpur(2023)**: Big Data Processing.

Reviewing

- Transactions on Machine Learning Research (TMLR 2025,2026)
- AAAI AI for Social Impact Track 2026

Awards And Achievements

- **ELIZA Scholarship**: Received for ELLIS exchange at INRIA Montpellier (2025).
- **Silver Medal**: Received for securing department rank 1 in Electronics at IIT Kharagpur (2023).
- **Chapak Lab Scholarship Awardee**: Received for summer internship at INRIA (2022).
- **GKF International Internship Scholarship**: Received for summer internship at INRIA (2022).
- **DAAD WISE Awardee**: Received for summer internship at TU Munich (2021).