Tathagata Dey | **22M0765**
Computer Science & Engineering | **M.Tech.**
Indian Institute of Technology Bombay | **Gender: Male**
DOB: 24/03/2000

Examination	University	Institute	Year	CPI / %
Post Graduation	IIT Bombay	IIT Bombay	2024	8.92
Graduation	MAKAUT	GCETTS	2022	9.13
Graduation Specialization: Computer Science and Engineering				

WORK EXPERIENCE & INTERNSHIPS

- **Artificial Intelligence Developer Intern** | ***LG Soft India Pvt. Ltd.*** *(May'23-July'23)*
  - Implemented a model for the problem statement of Table-to-text generation on Rotowire dataset.
  - Attained near state-of-the-art results with sequence-to-sequence model using Open Neural Machine Translation.
  - Gained expertise in linearizing tabular data, conducted extensive experiments on model parameters, refined data processing techniques, performed literature survey and developed a re-usable codebase.

M.TECH THESIS & SEMINAR

- **Table-to-text Generation with Subjectivity and Objectivity**
  (M.Tech Project | Guide: ***Prof. Pushpak Bhattacharyya****)* *(June'23-Present)*
  Current work:
  - Scraped tables of different genres and their target subjective text from the web. Studied the pragmatics behind emotional inference generated from that data.
  - Synthetically generated data instances of different genres. Developed an interface to annotate the data instances.

  Future work:
  - A suitable baseline model has to be developed for the objective and required data for model training or fine-tuning or prompting has to be manually annotated. This dataset will be the first published data with this objective.
  - Human evaluation has to be performed to determine efficiency as it will also be first-of-this-kind work.
- **Text Generation**
  (M.Tech Seminar | Guide: ***Prof. Pushpak Bhattacharyya****)* *(Jan'23-May'23)*
  - Explored text generation, focusing on movie scripts, studying objectives and techniques in-depth.
  - Evaluated leading models, examined applications in text generation, enhancing understanding of the landscape.

RESEARCH & DEVELOPMENT PROJECT

- **Natural Language Generation from RDF Triples**
  (R&D Work for course CS 691 | Guide: ***Prof. Pushpak Bhattacharyya****)* *(Jan'23-May'23)*
  - Developed a state-of-the-art model to generate text sentences from RDF triples with coverage and coherence.
  - Sequence-to-sequence model, such as T5-base with pipeline approach has been used to convert a knowledge graph into sentences. Results are generated on the WebNLG corpus with ablation studies and evaluations.

COURSE PROJECTS

- **Development of a Multi-threaded Web Server**
  (CS 744 | ***Prof. Mythili Vutukuru****)* *(July'22-Nov'22)*
  - Developed a webserver with multiple threads, capable of handling many clients simultaneously over TCP sockets.
  - Conducted performance optimization to overcome bottlenecks, resulting in a smooth and swift user experience.
- **Ghar Dhundo**
  (CS 699 | ***Prof. Bhaskaran Raman****)* *(July'22-Nov'22)*
  - Developed an application as a comprehensive platform to assist individuals in finding their ideal homes.
  - HTML, CSS, JS and Bootstrap have been used in the frontend while Python with Django and PostgreSQL have been used for the robust backend. Implemented features like login-signup, dynamic pricing and wishlist.
- **Linux Shell Functions Implementation**
  (CS 744 | ***Prof. Mythili Vutukuru****)* *(July'22-Nov'22)*
  - Implemented functional properties of a Linux shell, including background and foreground process handling.
  - Incorporated forking, reaping, process management, and signal handling along with efficiency testing.
- **Argument Generation with Prompting**
  (CS 772 | ***Prof. Pushpak Bhattacharyya****)* *(Jan'23-April'23)*
  - Implemented a state-of-the-art paper and duplicated the results on argument generation using T5 model.
  - Employed multi-task training, cumulative loss objective to predict arguments on CMV dataset arguments.
- **Picture-based Word Sense Disambiguation**
  (CS 772 | ***Prof. Pushpak Bhattacharyya****)* *(Jan'23-April'23)*

- Developed a machine learning model that leverages image inputs to disambiguate ambiguous words effectively.
- Curated an innovative dataset and manually annotated it for model evaluation, tailored for testing and validation.

- **POS Tagging Using Encoder-Decoder and FFNN**
  *(CS 772 | **Prof. Pushpak Bhattacharyya**)* *(Jan'23-April'23)*
  - Employed Encoder-Decoder architecture and Feed-forward Neural Network for POS Tagging of a give sentence.
  - Used Universal tagset, compared results of the two approaches and their analysed confusion matrices.
- **Mental Health Prediction Using Machine Learning Models**
  *(CS 725 | **Prof. Preethi Jyothi**)* *(July'22-Nov'22)*
  - Analyzed tech professionals' personal life dataset for mental health prediction; contributed to innovative research.
  - Leveraged diverse models; highlighted high-accuracy selections, enhancing mental health prediction accuracy.
- **Generating Context-based Word Vectors Using CBOW and Skipgram**
  (CS 772 | Prof. Pushpak Bhattacharyya) *(Jan'23-May'23)*
  - Compared CBoW and Skip-gram embeddings in word analogy task to assess their performance.
  - Utilized the Gutenberg corpus to train CboW and Skip-gram models.
- **Dynamics of Challenges Faced in Building a Startup**
  *(CS 752 | **Prof. Om Damani**)* *(Jan'23-April'23)*
  - Examined complex challenges in startup ecosystem—social, economic dynamics. Employed accurate models to pinpoint optimal conditions for robust growth using SFDs, CLDs and other parameters.

RESEARCH WORKS

- **Current Research Works**
  Currently working in the field of Natural Language Processing and AI at the CFILT Lab, Dept. of CSE, IIT Bombay.
  - Upcoming research paper submission include, **Survey of Triple to Text and Text to Triple Generation**, encompassing problem analysis, dataset overview, and different state-of-the-art methods for the said objective.
- **Previous Research Works**
  Previously worked in the field of Computational Biology. During this time period, published 5 Conference Proceedings, 4 Journal Articles and 1 Book Chapter. Some of the significant ones are mentioned below. *(July'19-July'22)*
  - **Identification and computational analysis of mutations in SARS-CoV-2**, *T. Dey, S. Chatterjee et al.*, Computers in Biology and Medicine, Elsevier, Vol 129, 104166, Feb 2021.
  - **Novel Algorithms for In Silico Peptide Vaccine Design with Reference to Ebola Virus**, *S. Biswas, T. Dey et al.*, in 2020 International Conference on Computer, Electrical & Communication Engineering (ICCECE), IEEE, 2020.

TECHNICAL SKILLS

- **Programming & Scripting Languages**: C++, Python, C, HTML, CSS, JS
- **Tools & Libraries**: MATLAB, LaTeX, Git, Bash, Tensorflow, Transformers, Scikit-learn, NLTK

POR & EXTRA-CURRICULARS

- **Student Companion, Institute Student Companion Programme (ISCP), IIT Bombay** *(July'23-present)*
  Working in a team of 235+ coordinators, ensuring a smooth transition of incoming first-year PG students. Completed Mentor Training Programme conducted by Student Wellness Center towards better mentoring.
- **Interview Coordinator, Institute Placement Cell, IIT Bombay** *(Dec'22)*
  Part of a team responsible for streamlining the placement process for 1800+ students. Acted as point of contact for students and several firms/universities collaborating the recruitment process.
- **Teaching Assistantship | CS 626 - Speech, NLP and The Web** | *Prof. Pushpak Bhattacharyya* *(Autumn 2023)*
  Evaluated assignments and course projects throughout the semester. Invigilated exams and conducted seamless availability of course materials to the students.
- **Teaching Assistantship | CS 230 & CS 232 - Digital Logic and Computer Architecture** | *Prof. Biswa Panda* *(Spring 2023)*
  Supervised labs for the course, evaluated lab assignments and lab quiz papers. Also designed tutorial papers and solutions, evaluated quizzes, midsem and endsem papers and helped in grading.
- **Teaching Assistantship | CS 310 - Automata Theory** | *Prof. G. Sivakumar* *(Autumn, 2022)*
  Contributed to designing tutorial, invigilated and evaluated the answer papers and helped in grading of the course.

AWARDS & ACHIEVEMENTS

- Secured **All India Rank 21** in GATE Computer Science Exam of 2022 out of 77257 candidates.
- Selected for **Summer Research Fellowship 2020** at **Jawaharlal Neheru Centre for Advanced Scientific Research**.
- Selected as **JBNSTS Senior Scholar Awardee** in the year of 2018.

HOBBIES

Watching and playing sports, Listening to music, Reading books, Swimming, Video-gaming.