Tathagata Dey

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Employment History

May, 2023 – · · · · **AI Developer Intern,** LG Soft India Pvt. Ltd.

April, 2022 - July, 2022 **Associate Faculty** Geeksforgeeks GATE Computer Science.

Education

2022-2024 **M.Tech, Indian Institute of Technology (IIT) Bombay** in Computer Science and Engineering.

2018-2022 **B.Tech, Govt. College of Engineering and Textile Technology** in Computer Sciencce and Engineering
Grade: 9.13/10.

Major Projects

Natural Language Generation from RDF Triples under Prof. Pushpak Bhattacharyya
Spring, 2023 - CS 691 (Research and Development Course)
Developed a state-of-the-art model to generate textual sentences from multiple RDF triples covering all the information. A pipeline approach with T5 and few-shot prompting generates the output.

Seminar Thesis

Text Generation under Prof. Pushpak Bhattacharyya
Spring, 2023 - CS 694 (Literature Survey Course)
Studied various aspects and objectives of text generation with special emphasis on movie script generation. Analysed and compared the state-of-the-art models in this field and their applications.

Course Projects

Argument Generation with Prompting under Prof. Pushpak Bhattacharyya
Spring, 2023 - CS 772 (Deep Learning for Natural Language Processing)
Performed argument generation on CMV dataset using multi-task prompting on T5 model. The model was trained to optimize all the losses of different objectives.

Picture-based Word Sense Disambiguation under Prof. Pushpak Bhattacharyya
Spring, 2023 - CS 772 (Deep Learning for Natural Language Processing)
Implemented a model to identify correct meaning of an ambiguous word through picture input. Created a novel sample dataset to test the results.

POS Tagging Using Encoder-Decoder and FFNN under Prof. Pushpak Bhattacharyya
Spring, 2023 - CS 772 (Deep Learning for Natural Language Processing)
Developed two seperate models for POS Tagging on the universal tagset using Encoder-Decoder architecture and Feed-forward Neural Network.

Course Projects (continued)

- **Mental Health Prediction Using Machine Learning Models** under Prof. Preethi Jyothi
  Autumn, 2022 - CS 725 (Foundations of Machine Learning)
  A dataset of personal life-based answers of tech people is used to predict mental health. Various models are used and the best of them are mentioned.

- **Ghar Dhundo** under Prof. Bhaskaran Raman
  Autumn, 2022 - CS 699 (Software Lab)
  Building a website to find various homes or apartments for buying, renting or leasing based on different demographics, features and facilities.

- **Multi-threaded Web Server** under Prof. Mythili Vutukur
  Autumn, 2022 - CS 744 (Design and Engineering of Computing Systems)
  Built a webserver with multiple threads, capable of handling many clients at the same time over TCP sockets. HTTP requests are served successfully and also the performance bottlenecks are optimized.

- **Linux Shell Functions Implementation** under Prof. Mythili Vutukuru
  Autumn, 2022 - CS 744 (Design and Engineering of Computing Systems)
  Implemented functional properties of a linux shell. Background process, foreground process, forking, reaping, process memory management and signal handling have been implemented along with efficient testing.

- **Dynamics of Challenges Faced in Building a Startup** under Prof. Om Damani
  Spring, 2023 - CS 752 (System Dynamics)
  Analysed various social, economic and dynamic challenges faced by a startup system. Modeled them and simulated to find right situation for a startup growth.

Research Publications

Journal Articles

1. S. Biswas, S. Manna, T. Dey, S. Chatterjee, and S. Dey, "Identification of generalized peptide regions for designing vaccine effective for all significant mutated strains of sars-cov-2," *Combinatorial Chemistry & High Throughput Screening*, vol. 25, no. 3, pp. 414–428, 2022.
2. S. C. Basak, T. Dey, A. Nandy, *et al.*, "Cluster analysis of coronavirus sequences using computational sequence descriptors: With applications to sars, mers and sars-cov-2 (covid-19)," *Current Computer-Aided Drug Design*, vol. 17, no. 7, pp. 936–945, 2021.
3. T. Dey, S. Chatterjee, S. Manna, A. Nandy, and S. C. Basak, "Identification and computational analysis of mutations in sars-cov-2," *Computers in biology and medicine*, vol. 129, p. 104 166, 2021.
4. S. Chatterjee, T. Dey, and S. Manna, "Emergence of a pathogenic strain of covid-19," *Journal of Bioinformatics and Systems Biology*, vol. 3, no. 4, pp. 81–91, 2020.

Conference Proceedings

1. S. Biswas, S. Chatterjee, T. Dey, *et al.*, "In silico approach for peptide vaccine design for covid 19," in *MDPI AG in MOL2NET 2020, International conference on multidisciplinary sciences, 6th edition session USINEWS-04: US-IN-EU Worldwide Science Workshop Series, UMN, Duluth, USA*, vol. 10, 2020.
2. S. Biswas, T. Dey, S. Chatterjee, *et al.*, "Novel algorithms for in silico peptide vaccine design with reference to ebola virus," in *2020 International Conference on Computer, Electrical & Communication Engineering (ICCECE)*, IEEE, 2020, pp. 1–8.

3. T. Dey, S. Chatterjee, S. Manna, A. Nandy, and S. Basak, "New computational analysis to identify the mutational changes in sars-cov-2, mol2net," in *International Conference on Multidisciplinary Sciences USINEWS-04*, 2020.
4. T. Deya, S. Biswas, S. Chatterjee, S. Manna, A. Nandye, and S. C. Basake, "2d polar co-ordinate representation of amino acid sequences with some applications to ebola virus, sars and sars-cov-2 (covid-19)," in *MOL2NET, Int. Conf. Multidisciplinary Sci*, 2020.
5. S. Biswas, T. Dey, S. Chatterjee, *et al.*, "A novel approach to peptide vaccine design for ebola virus," in *MDPI AG in MOL2NET 2019, International conference on multidisciplinary sciences, 5th edition session USINEWS-03: US-IN-EU Worldwide Science Workshop Series, UMN, Duluth, USA*, vol. 10, 2019.

Books and Chapters

1. D. Sen, T. Dey, M. Vračko, A. Nandy, and S. C. Basak, "Applications of alignment-free sequence descriptors in the characterization of sequences in the age of big data: A case study with zika virus, sars, mers, and covid-19," in *Big Data Analytics in Chemoinformatics and Bioinformatics*, Elsevier, 2023, pp. 359–390.

Skills

Programming	Python, C, C++.
ML Libraries	Scikit-learn, Keras, Tensorflow, Nltk, Gensim, Matplotlib
Limited Exposure	Html, CSS, Js, Matlab, Git, Latex, Bash.
Soft Skills	Hard-working, Enthusiastic to learn, Communicative, Considerate.
Languages	Strong reading, writing and speaking competencies for English, Hindi and Bengali.

Miscellaneous Experience

Awards and Achievements

2022	Secured **All India Rank 21** in GATE Computer Science Exam of 2022.
	Secured **All India Rank 15** in Joint Entrance Screening Test in Computer Science of 2022.
2020	Selected for **Summer Research Fellowship** in the year of 2020 at **Jawaharlal Neheru Centre for Advanced Scientific Research**, Bangalore.
2018	Selected as **JBNSTS Senior Scholar Awardee** in the year of 2018.

Position of Responsibility

Dec, 2022	**Interview Coordinator**. Conducted placement cell tests, proctored tests on numerous occasions and managed company executives during placement season.
Spring, 2023	**Teaching Assistant - CS 230**. Course Digital Logic and Computer Architecture for Spring 2022 under Prof. B. Panda.
	Teaching Assistant - CS 301. Course Digital Logic and Computer Architecture Lab for Spring 2022 under Prof. B. Panda.
Autumn, 2022	**Teaching Assistant - CS 301**. Course Automata Theory for Autumn 2022 under Prof. G. Sivakumar.