Saptarashmi Bandyopadhyay

Department of Computer Science
University of Maryland, College Park
Maryland 20742
United States of America

Email: sapta.band59@gmail.com
Phone: +18146992126
Skype ID: saptarashmicse
Google Scholar

Education

University of Maryland, College Park — *2020 - present*
PhD student in Computer Science — GPA: 4.0/4.0

The Pennsylvania State University, University Park — *2018 - 2020*
M.S. in Computer Science and Engineering — GPA: 3.94/4.0

Indian Institute of Engineering Science & Technology, Shibpur — *2014 - 2018*
B.Tech (Honours) in Computer Science and Engineering — GPA: 9.42/10

Publications

1. **Targets in Reinforcement Learning to solve Stackelberg Security Games**
Saptarashmi Bandyopadhyay, Chenqi Zhu, Philip Daniel, Joshua Morrison, Ethan Shay, John Dickerson
AAAI 2022 Fall Symposium (FSS-22) symposium "Lessons Learned for Autonomous Assessment of Machine Abilities (LLAAMA)." (accepted for presentaton in November 2022)

2. **Cooperation in Hybrid Multi-agent Reinforcement Learning for interdiction games**
Saptarashmi Bandyopadhyay, John Dickerson
Microsoft Research-TTIC workshop on "New Models in Online Decision Making for Real-World Applications" at Toyota Technological Institute, Chicago, 2022 Poster

3. **Preventing Deforestation: Modeling and Prediction of Vulnerabilities in Forest Conservation**
Saptarashmi Bandyopadhyay, Deepthi Raghunandan, Dhruva Sahrawat, John Dickerson
*Annual AAAI Workshop on Artificial Intelligence to Accelerate Science and Engineering (AI2ASE) at the 36th AAAI Conference on Artificial Intelligence (**AAAI**), 2022* Paper Proceedings Poster

4. **Interactive Visualizations of Word Embeddings for K-12 students**
Saptarashmi Bandyopadhyay, Jason Xu, Neel Pawar and David Touretzky
*Proceedings of the Twelfth AAAI Symposium on Educational Advances in Artificial Intelligence (**EAAI**) 2022 at the 36th AAAI Conference on Artificial Intelligence (**AAAI**), 2022* Paper Proceedings Demo

5. **The University of Maryland, College Park Submission to Large-Scale Multilingual Shared Task at WMT 2021**
Saptarashmi Bandyopadhyay, Tasnim Kabir, Zizhen Lian, Marine Carpuat
*Proceedings of the 6th Conference on Machine Translation (**WMT**) 2021 at the 25th Conference on Empirical Methods in Natural Language Processing (**EMNLP**), 2021* Paper Proceedings Poster

6. **Tweets and Social Network Data for Twitter Bot Analysis**
Jennifer Golbeck, Niloofarsadat Alavi, Hannah K. Bako, **Saptarashmi Bandyopadhyay** et. al.
*Proceedings of **SBP-BRiMS**: 2021 International Conference on Social Computing, Behavioral-Cultural Modeling & Prediction and Behavior Representation in Modeling and Simulation* Paper Proceedings

7. **Natural Language Response Generation from SQL with Generalization and Back-translation**
Saptarashmi Bandyopadhyay, Tianyang Zhao
*Proceedings of **IntEx-SemPar**: Interactive and Executable Semantic Parsing, 2020 Workshop at the 24th Conference on Empirical Methods in Natural Language Processing (**EMNLP**), 2020* Paper Proceedings Presentation

8. **UdS-DFKI@WMT20: Unsupervised MT and Very Low Resource Supervised MT for German↔Upper Sorbian**
Sourav Dutta, Jesujoba O. Alabi, **Saptarashmi Bandyopadhyay**, Dana Ruiter, Josef van Genabith
*Proceedings of the 5th Conference on Machine Translation (**WMT**) 2020 at the 24th Conference on Empirical Methods in Natural Language Processing (**EMNLP**), 2020* Paper Presentation

9. **Blood vessel segmentation in narrow band imaging bronchoscopic video**
Saptarashmi Bandyopadhyay, Vahid Daneshpajooh, William E. Higgins, Danish Ahmad, Jennifer Toth, Rebecca Bascom
*Biomedical Applications in Molecular, Structural, and Functional Imaging Conference at the Society of Photo-Optical Instrumentation Engineers (**SPIE**) Medical imaging, 2021 Symposium* Paper Summary

10. **Super-resolution and deblurring enhancement for narrow band imaging bronchoscopy**
Vahid Daneshpajooh,**Saptarashmi Bandyopadhyay**, William E. Higgins, Danish Ahmad, Jennifer Toth, Rebecca Bascom
*Image Processing Conference at the Society of Photo-Optical Instrumentation Engineers (**SPIE**) Medical imaging, 2021 Symposium*, **Received the Honorable Mention (2nd Place) Poster Award** Paper Summary

11. **Factored Neural Machine Translation on Low Resource Languages in the COVID-19 crisis**
Saptarashmi Bandyopadhyay
*Poster Session of ACL 2020 Workshop on Natural Language Processing for COVID-19 (NLP-COVID 19 Workshop) at the 58th Annual Meeting of the Association for Computational Linguistics **ACL**, 2020* Paper Poster Video

12. **Factored Neural Machine Translation at LoResMT 2019**
Saptarashmi Bandyopadhyay
*Proceedings of the 2nd Workshop on Technologies for MT of Low Resource Languages, 17th Machine Translation Summit (**MT Summit**), 2019 (in **ACL** Anthology)* Paper

13. **Read, Highlight and Summarize: A Hierarchical Neural Semantic Encoder-based Approach**
Rajeev Bhatt Ambati, **Saptarashmi Bandyopadhyay**, Prasenjit Mitra
***Arxiv**, 2019* Paper Code

14. **Correlation Distance based Information Extraction System at FIRE 2016 Microblog Track**
Saptarashmi Bandyopadhyay
*8th **FIRE** (Forum for Information Retrieval Evaluation) 2016* Paper Presentation

15. **Content selection as semantic-based ontology exploration**
Laura Perez-Beltrachini, Claire Gardent, Anselme Revuz, **Saptarashmi Bandyopadhyay**
*2nd **WebNLG** Workshop 2016 at the 9th **INLG** conference (International Natural Language Generation conference), 2016 (in **ACL** Anthology)* Paper

16. **Thresholding of histopathological images of oral mucosa for identification of precancerous OSMF cells - a novel entropy based approach**
Saptarashmi Bandyopadhyay, Soumyadeep Basu, Ranjan Rashmi Paul, Ajoy Kumar Ray
*12th **VISIGRAPP** (International Joint Conference on Computer Vision, Imaging and Computer Graphics Theory and Applications) (4:**VISAPP**) 2017* Paper

17. **SEMRSA: Spectrum Efficient Modulation-aware Dynamic Routing & Spectrum Allocation in Elastic Optical Network**
Saptarashmi Bandyopadhyay, Vishal Dey, Monish Chatterjee, Uma Bhattacharya
*Proceedings of the 8th International Conference on Computer Modeling and Simulation (ICCMS), **ACM**, 2017* Paper

18. **An online cost-effective protection scheme for quick recovery in all-optical WDM mesh networks**
Vishal Dey, Monish Chatterjee, **Saptarashmi Bandyopadhyay**, Uma Bhattacharya
*Photonic Network Communications, **Springer**, 2018* Paper

Research Internships

1. **DFKI (German Research Center for Artificial Intelligence), Saarbrucken, Germany** *May - July, 2017*
Advisor: Prof. Josef van Genabith
Topic: Handling of in-line mark-up in Statistical Machine Translation and Neural Machine Translation

2. **LORIA, INRIA Nancy, France** *May - July, 2016*
Advisors: Dr. Laura Perez Beltrachini and Prof. Claire Gardent, Charpak Internship Scholarship Programme
Topic: Automatically constructing a corpus to train a neural model for content selection from incomplete ontologies

3. **University of Saarland, Saarbrucken, Germany** *June, 2015*
Advisor: Prof. Josef van Genabith
Topic: Data preparation and software development for semantically enhanced Statistical Machine Translation

Research Projects

1. **Multi-agent Reinforcement Learning for interdiction games (NSF project)** *Spring, Summer, Fall 2022*

2. **Inverse Scaling on Psychological Profiles of Large Language Models (LLMs)** *Summer 2022*

3. **Data analysis of a Health Information Application for minority users (NIH-NLM project)** *Spring 2022*

4. **Machine Learning Fairness Evaluation Rooted in Justice** Report *Fall 2021*

5. **Data Collection to detect Good and Bad Questions for Learning** *Fall 2021*
6. **Adversarial Question Writing based Web Interface for Improvised Learning** Demo Code *Summer 2021*
7. **Automated Speech Recognition in Question Answering** Demo Code *Summer 2021*
8. **Question Answering system improvisation using Item Response Theory** *Summer 2021*
9. **Question Answering using Machine Translation and Natural Language Generation** *Summer 2021*
10. **Computational Mechanisms and Incentives for Forest Conservation** *Spring 2021*
11. **BERT attention based Low Resource Multilingual Neural Machine Translation** *Spring 2021*
12. **Verification of Claims in the COVID-19 Pandemic** Report *Fall 2020*
13. **Fine-grained Image-to-Image Editing from Text Captions** Report *Fall 2020*
14. **Twitter Data Analysis in the Government, Sports, Acting and COVID-19 domains** *Summer 2020*
    Advisor: Prof. Kathleen Carley, Carnegie Mellon University
15. **Interactive Visualizations of Word Vector Embeddings** *Summer 2020*
    Advisor: Prof. Dave Touretzky, Carnegie Mellon University Demo Code
16. **Fake News Detection Challenge @ KDD2020 TrueFact Workshop** Presentation *Summer 2020*
17. **Vessel Segmentation in Narrow Band Imaging Bronchoscopic Video** *Fall 2019 - Spring 2020*
    Advisor: Prof. William Evan Higgins, Pennsylvania State University, (NIH funded project) Thesis
18. **Sentiment based Multi-graph Learning for Fake News Detection and Analysis** Report *Fall 2019*
19. **Reinforcement Learning Based Query Evaluation Using Dynamic Time Slices** Report *Fall 2019*
20. **Graph Neural Network based System Attack Detection from Hardware Monitoring** Report *Fall 2019*
21. **Development and implementation of Question Answering System for querying Knowledge Graphs (a project involving the Army Research Lab)** *Summer 2019*
22. **Computational and statistical challenges of Deep Q/Reinforcement Learning** Report *Spring 2019*
23. **Efficient neural machine translation model for natural language generation** Report *Spring 2019*
24. **Development of CoSpecDetect tool to collect annotated data for automated identification of ideas in essays (funded by NSF)** Code *Spring 2019*
25. **Texture Segmentation** Report *Spring 2019*
26. **Non-Linear Filtering and Anisotropic Diffusion** Report *Spring 2019*
27. **The Morphological Skeleton and Shape Analysis** Report *Spring 2019*
28. **Shape Detection using Morphological Operations** Report *Spring 2019*
29. **A Survey Paper on Internet of Things Architecture** Report *Fall 2018*
30. **A Review of NLP Annotation Tools and Platforms for Semantics and Pragmatics** Report *Fall 2018*
31. **Implementation of Low-Density Parity Checker** Report *2016-2018*
32. **Development and Analysis of Indian Crime Graph Database** Report *2016-2018*
33. **Directed graph representation and analysis of Indian legal corpus** Report *2016-2018*

Scholastic Achievements

1. **Awarded as a Do Good Accelerator Fellow at the University of Maryland, College Park** *2022*
2. **ICML 2022**, **AAAI 2022** and **EAAI 2022** Scholarships *2022*
3. **Funding to present at Microsoft Research-TTIC workshop on "New Models in Online Decision Making for Real-World Applications" at Toyota Technological Institute, Chicago** *2022*
4. **Awarded the Dean's Summer Research Fellowship at the University of Maryland, College Park** *2021*

5. **Accepted to the ACM FAccT 2021** Doctoral Consortium *2021*
6. **Accepted to the Legal Tech Summer School at the Technical University (TU), Munich, Germany** *2021*
7. **Accepted to the U21 Global Citizenship Program from the University of Maryland, College Park** *2021*
8. **ACL 2021** and **ACL 2020** Student Volunteer Awards *2020, 2021*
9. **ICML 2020** Student Volunteer Award *2020*
10. **NeurIPS 2020** Student Volunteer Award *2020*
11. Member of the **MIT Isolat Collaboration** on COVID -19 research *2020*
12. **ACM** Student Travel Award to attend **KDD 2019** conference by **ACM SIGKDD** *2019*
13. **Charpak Internship Scholarship Programme, 2016 - one of the 25 students** selected for the Scholarship Programme by **the Government of France** *2016*
14. **Jagadish Bose National Science Talent Search (JBNSTS) Scholar, 2014** funded by **Department of Science and Technology, Government of India** and **Government of West Bengal** *2014*
15. Eligible for **DST-Inspire Fellowship** - among **top 1% of the students in All India Senior School Certificate Examination, 2014** *2014*

Work Experience

1. **Department of Computer Science, University of Maryland, College Park**
   (a) *Graduate Research Assistant for a NSF project* *Summer, Fall 2022*
   (b) *Graduate Teaching Assistant for CMSC 724 Database Management Systems* *Spring 2022*
   (c) *Graduate Research Assistant on Question Answering research projects* *Summer 2021*
   (d) *Graduate Teaching Assistant for CMSC 470 Natural Language Processing* *Spring 2021*
   (e) *Graduate Teaching Assistant for CMSC 424 Database Design* *Fall 2020 , Fall 2021*
2. **Department of Computer Science & Engineering, Pennsylvania State University**
   (a) *Graduate Teaching Assistant for CMPSC 431W, Database Management Systems* *Spring 2020*
   (b) *Graduate Teaching Assistant for CMPEN 455, Digital Image Processing course* *Fall 2019*
3. **Department of Computer Science & Engineering, Pennsylvania State University** *Summer 2019*
   *Summer Research Assistant working on a project under **U.S. Army Research Laboratory, Network Science, Collaborative Technology Alliance (NSCTA)**, to generate graphs for sustained investigation of knowledge bases*
4. **Department of Computer Science & Engineering, Pennsylvania State University** *Fall 2018 - Spring 2019*
   Graduate Research Assistant with Grade 16 assistantship

Technical Skills

1. Programming Languages – C, C++, MATLAB, Python, JAVA, R, MySQL, SPARQL Query Language, Javascript, PL/SQL, SchemeLISP, Bash, Prolog, Verilog
2. Techniques and software exposed to
   - Statistical Machine Translation Tools, MOSES, Neural Machine Translation tools like OpenNMT, TensorflowNMT, FairSeq
   - Working with BabelNet, WordNet, VerbNet, CPlex, GnuPlot, Weka, sentencepiece, NLTK, plotlyJS libraries
   - Machine Learning tools: TensorFlow, Pytorch, Theano, TensorflowJS
   - Node JS, Angular JS, Django, Flask frameworks
   - MySQLDB, PostgreSQL, MongoDB, OracleDB Database
   - Natural Language Processing: Dependency tree structures, DBPedia entities, Word2Vec, BERT, Twitter API
   - Semantic Web (SW): Ontologies (specially taxonomies), Resource Description Framework (RDF) data and SPARQL Query Language for RDF
   - Large Scale data processing: parallel computing using a computer cluster CiGri.

- Programming and development: Java, Eclipse, Jena, Git version control system, Stanford Named Entity Tagger, Stanford Dependency Parser, Apache Maven
- Network Tools: Wireshark, netlink socket programming, FPGA programming
- Compiler Tools - lex, yacc
- Decompiler – jdcmd, luyten
- Annotation Tools – GATE, DUCView, PyrEval
- Crowd-sourcing Platform – Amazon Mechanical Turk
- Human Computer Interaction tools – Axure RP, RUI (Recording User Input)
- Virtual Machine: VirtualBox, Vagrant, Docker
- Simulation tools: LabView, Matlab Simulink, Multisim, Modelsim, GEM5

Miscellaneous Experience

1. Member of AAMAS 2023 Conference Program Committee *2022-2023*
2. Invited Speaker to an open problem session at Microsoft Research-TTIC workshop on "New Models in Online Decision Making for Real-World Applications" at Toyota Technological Institute, Chicago. *2022*
3. Invited Speaker at the AI4ALL Outreach Event hosted by the University of Maryland, College Park *2021*; *2022*
4. Mentor of a research project with students from underrepresented genders at the University of Maryland, College Park Technica 2021 Research Outreach Hackathon *2021*
5. Member of EMNLP 2021 Conference Program Committee *2021*
6. Selected as Presenter at UAI 2021 Conference *2021*
7. Leading and guiding Question Answering research projects with 16 interns in BS, MS and High School at USA, India, China and Bahrain *2021*
8. Mentor of a research project on "Building a Question-Answering Project" with BIPOC students at the University of Maryland, College Park Bitcamp 2021 Research Outreach Hackathon *2021*
9. Member of the Advisory Committee on Transport Data Equity Initiative, a project of the University of Washington and the US Department of Transportation *2021*
10. Student Reviewer for the Computer Science graduate programs at the University of Maryland, College Park *2020*
11. Reviewer of NLP COVID-19 Workshop (Part 2) @ EMNLP 2020 *2020*
12. IRB training at Pennsylvania State University *2018, 2019*
13. An Organizer of the 3rd NLP Colloquium at the Pennsylvania State University *2018*
14. Delivered 5 talks at the Reinforcement Learning Reading Group at Pennsylvania State University *2018*

Special Achievements

1. Selected as one of the ten students of among all national level institutions in India to interact with the Hon'ble President of India in 2016 to share experience on the topic "Youth and Nation building"
2. Writing Regular articles in The Statesman, a leading newspaper in India, as Voices Coordinator
3. Seventh Position in a competition of Manually controlled bots as part of a Four Member team in the DIY 3.0.0. Challenge of 'ROBODARSHAN' – IIEST Robotics Society
4. Debating
   - Second Position in the Fresher's Debate '14 organized by IIEST Debating Society
   - Best Interjector in the Fresher's Debate '14 organized by IIEST Debating Society
5. Sangeet Bhushan (Final) in Vocal Classical Pracheen Kala Kendra, Chandigarh, India.