Saptarashmi Bandyopadhyay

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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. **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

2. **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

3. **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

4. **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* Paper Summary

5. **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

6. **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

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

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

9. **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

10. **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

11. **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

12. **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

Publications (under submission)

1. **Development of Tagged Parallel Corpus for Efficient Low-Resource Neural Machine Translation: Nepali-English and English-Nepali**,
Saptarashmi Bandyopadhyay

2. **Graph-based Detection and Profiling of the Most Influential Hackers**
Saptarashmi Bandyopadhyay

3. **A Retrospective Study on Deep Visual Learning**
Saptarashmi Bandyopadhyay, Ajoy Kumar Ray

4. **Deep Learning based System Vulnerability Detection**
Asmit De, **Saptarashmi Bandyopadhyay**, Swaroop Ghosh

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. **Verification of Claims in the COVID-19 Pandemic** Report *Fall 2020*

2. **Fine-grained Image-to-Image Editing from Text Captions** Report *Fall 2020*

3. **Twitter Data Analysis in the Government, Sports, Acting and COVID-19 domains** *Summer 2020*
Advisor: Prof. Kathleen Carley, Carnegie Mellon University

4. **Interactive Visualizations of Word Vector Embeddings** *Summer 2020*
Advisor: Prof. Dave Touretzky, Carnegie Mellon University Demo Code

5. **Fake News Detection Challenge @ KDD2020 TrueFact Workshop** Presentation *Summer 2020*

6. **Vessel Segmentation in Narrow Band Imaging Bronchoscopic Video** *Fall 2019 - Spring 2020*
Advisor: Prof. William Evan Higgins, Pennsylvania State University, (NIH funded project) Thesis

7. **Sentiment based Multi-graph Learning for Fake News Detection and Analysis** Report *Fall 2019*

8. **Reinforcement Learning Based Query Evaluation Using Dynamic Time Slices** Report *Fall 2019*
9. **Graph Neural Network based System Attack Detection from Hardware Monitoring** Report *Fall 2019*
10. **Development and implementation of Question Answering System for querying Knowledge Graphs (a project involving the Army Research Lab)** *Summer 2019*
11. **Computational and statistical challenges of Deep Q/Reinforcement Learning** Report *Spring 2019*
12. **Efficient neural machine translation model for natural language generation** Report *Spring 2019*
13. **Development of CoSpecDetect tool to collect annotated data for automated identification of ideas in essays (funded by NSF)** Code *Spring 2019*
14. **Texture Segmentation** Report *Spring 2019*
15. **Non-Linear Filtering and Anisotropic Diffusion** Report *Spring 2019*
16. **The Morphological Skeleton and Shape Analysis** Report *Spring 2019*
17. **Shape Detection using Morphological Operations** Report *Spring 2019*
18. **A Survey Paper on Internet of Things Architecture** Report *Fall 2018*
19. **A Review of NLP Annotation Tools and Platforms for Semantics and Pragmatics** Report *Fall 2018*
20. **Implementation of Low-Density Parity Checker** Report *2016-2018*
21. **Development and Analysis of Indian Crime Graph Database** Report *2016-2018*
22. **Directed graph representation and analysis of Indian legal corpus** Report *2016-2018*

Scholastic Achievements

1. **ACL 2020** Student Volunteer Award *2020*
2. **ICML 2020** Student Volunteer Award *2020*
3. **NeurIPS 2020** Student Volunteer Award *2020*
4. Member of the **MIT Isolat Collaboration** on COVID -19 research *2020*
5. **ACM** Student Travel Award to attend **KDD 2019** conference by **ACM SIGKDD** *2019*
6. **Charpak Internship Scholarship Programme, 2016 - one of the 25 students** selected for the Scholarship Programme by **the Government of France** *2016*
7. **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*
8. 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** *Spring 2021*
   Graduate Teaching Assistant for CMSC 470 Natural Language Processing
2. **Department of Computer Science, University of Maryland, College Park** *Fall 2020*
   Graduate Teaching Assistant for CMSC 424 Database Design
3. **Department of Computer Science & Engineering, Pennsylvania State University** *Spring 2020*
   Graduate Teaching Assistant for CMPSC 431W, Database Management Systems
4. **Department of Computer Science & Engineering, Pennsylvania State University** *Fall 2019*
   Graduate Teaching Assistant for CMPEN 455, Digital Image Processing course

5. **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*
6. **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
   - Working with BabelNet, WordNet, VerbNet, CPlex, GnuPlot, Weka, sentencepiece, NLTK, plotlyJS libraries
   - Machine Learning tools: TensorFlow, Theano, TensorflowJS, Pytorch
   - 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. Reviewer of NLP COVID-19 Workshop (Part 2) @ EMNLP 2020 *2020*
2. IRB training at Pennsylvania State University *2018, 2019*
3. An Organizer of the 3rd NLP Colloquium at the Pennsylvania State University *2018*
4. 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 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.