SOMNATH BASU ROY CHOWDHURY

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Research Interests

Machine Learning, Statistical Natural Language Processing, Knowledge Graphs. Current Focus: Graph neural network applications in natural language and commonsense knowledge incorporation in NLP tasks.

Education

University of North Carolina (UNC) at Chapel Hill   2021 - present
Ph.D. in Computer Science
Advisor: Prof. Snigdha Chaturvedi

Indian Institute of Technology (IIT) - Kharagpur, India   2013 - 2018
B.Tech. & M.Tech. (Dual Degree Hons.) in Electrical Engineering
Minor in Computer Science & Engineering (CSE)
Micro-specialization in Embedded Wireless Systems (EWS)
Advisor: Prof. Jayanta Mukhopadhyay

Publications

Google Scholar: xGbyrIUAAAAJ. (Note: Most computer science researchers publish more in conferences than journals. Conferences are considered equally or more prestigious than journals, all conferences below including short papers have an acceptance rate $< 25\%$.)

Peer reviewed publications:

7. Towards efficient data normalization using grammar-based parsing
   Somnath Basu Roy Chowdhury, Aresh Mishra and Ayan Banerjee
   Proceedings of **Microsoft Journal of Applied Research (MSJAR), 2020**. (*Internal*)

6. Instance-based Inductive Deep Transfer Learning by Cross-Dataset Querying with LSH
   Somnath Basu Roy Chowdhury, K.M. Annervaz and Ambedkar Dukkipati.
   Proceedings of **DeepLo Workshop, EMNLP 2019**. [pdf]

5. Learning beyond datasets: Knowledge Graph Augmented neural networks for NLP
   K.M. Annervaz*, Somnath Basu Roy Chowdhury* and Ambedkar Dukkipati.
   Proceeding of **NAACL 2018**. (Long, Oral) [pdf]

4. AdGAP: Advanced Global Average Pooling
   Arna Ghosh, Biswarup Bhattacharya* and Somnath Basu Roy Chowdhury*
   Proceedings of **AAAI 2018**. (Student Abstract) [pdf]

3. Training Autoencoders in Sparse Domain
   Biswarup Bhattacharya, Arna Ghosh* and Somnath Basu Roy Chowdhury*
   Proceedings of **AAAI 2018**. (Student Abstract) [pdf]

2. Handwriting Profiling using Generative Adversarial Networks
   Arna Ghosh*, Biswarup Bhattacharya* and Somnath Basu Roy Chowdhury*
   Proceedings of **AAAI 2017**. (Student Abstract) [pdf]

1. SAD-GAN: Synthetic Autonomous Driving using Generative Adversarial Networks
   Arna Ghosh*, Biswarup Bhattacharya* and Somnath Basu Roy Chowdhury*
   Proceedings of **DLAI Workshop, NIPS 2016**. [pdf]

   (* = equal contribution)

Theses:

1. Lung Cancer segmentation in 3D CBCT Images
   Advisor: Prof. Jayanta Mukhopadhyay
   M.Tech. Thesis, IIT Kharagpur [pdf]

Research and Work Experience

UNC Chapel Hill, Computer Science Dept.   (2021 - *present*)
Graduate Research Assistant, UNC-NLP
Advisor: Prof. Snigdha Chaturvedi

Microsoft Corporation   (July 2019 - Dec 2020)
Data Scientist II, Semi-Structured Information Retrieval team (Bing)

- Developed a context-free grammar framework leveraging *Earley parsing* and improved it to handle right-recursive scenarios enhancing down-stream schema-matching performance by $\sim 400 - 1200\%$

- Part of the team to setup a *semi-structured knowledge graph* from scratch and shipped 100M+ entity panes on Bing from unstructured data. Leveraged *entropy-based signals* from user-queries to perform *conflation* and ship over 200K entity panes for people segment

Apple Inc.   (*June 2018 - July 2019*)
Software Engineer, Apple Security Engineering
Complex event processing for access management.

Accenture Technologies Lab (ATL)   (*Summer 2017*)
Research Intern, Topic: Knowledge graph enhanced NLP
Advisor: K. M. Annervaz (ATL), Prof. Ambedkar Dukkipati, (IISc)

Statistics and Machine Learning Group, IISc   (*May 2017 - April 2018*)
Research Intern, Topic: Low Resource NLP
Advisor: Prof. Ambedkar Dukkipati

Visual Information Processing Lab - IIT Kharagpur   (*2016 - 2018*)
Undergraduate Researcher, Topic: Lung Cancer Segmentation in 3D CBCT
Advisor: Prof. Jayanta Mukhopadhyay

National Brain Research Centre - Gurgaon, India   (*Summer 2015*)
IAS Summer Fellow, Topic: Image Processing in MRI scans
Advisor: Prof. Pravat Mandal

Professional Service/ Teaching

- **Program Committee Member/ Reviewer**
  3rd workshop on Narrative Understanding Workshop, NAACL   2021
- *Teaching Assistant* (EE21101)
  Signals and Networks Lab, IIT Kharagpur   2018
- *Teaching Assistant* (EE19001)
  Electrical Technology Lab, IIT Kharagpur   2017

Talks

'Probabilistically grounded word embeddings', Bing paper reading forum, *Microsoft*   (Nov 2019)

'Secure Machine Learning', *Apple India Research Forum*   (April 2019)

Academic Achievements

- *All India Rank* 7 (EECS) - Nationwide Education & Scholarship Test (NEST - II).   2017
- *ACM-ICPC Asia-Chennai Regionals* - Rank 33/1100   2015
- *IAS Summer Research Fellowship* - National Brain Research Center   2015
- *Department Change*, IIT Kharagpur - Rank 3/52 department students   2014
- *INSPIRE Scholarship* - Top 1 percentile in ISC (Grade 12).   2013
- *Top ranks* - JEE (Mains, Advanced): 99.9+ percentile, Top 1% in ISCE & ISC   2013

Miscellaneous Activities

- *Winner* of the WaterAid Marathon Hyderabad - *5km* category   2019
- *Best Innovation Award* - Apple EMEIA Hackathon   2018
- *Special Mention in Technology GC* - Graduating batch LBS Hall.   2018
- *Silver-medal* winning Data Analytics team - Inter-hostel GC   2017
- *Gold-medal* winning Hardware Modeling team- Inter-hostel GC   2015
- 5th year distinction in *Fine Arts* and Painting - All India Art and Crafts Society   2010