Anusri Pampari

Contact Information

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Research Interests

Machine Learning for Biomedicine: Application of machine learning to health-care and biology, Model interpretability, Natural Language Processing, Question Answering, Biomedical Imaging

Education

University of Illinois at Urbana-Champaign (UIUC) **3.9/4.0**
M.S., Computer Science, 2016-18

Indian Institute of Technology (IIT), Bombay, India **9.1/10.0**
B.Tech - M.Tech (Dual Degree), Electrical Engineering, 2011-16

Publications

EMNLP 2018: Empirical Methods in Natural Language Processing
"emrQA: A Large Corpus for Question Answering on Electronic Medical Records" [arXiv link]
Authors: A. Pampari, P. Raghavan (IBM Research), J. Liang (IBM Research), J. Peng (UIUC)

Oral paper (acceptance rate: 10%)

Awarded the **Best Paper and Presentation Award** at the American Medical Informatics Association's (AMIA 2017) doctoral student consortium. Only masters student to be selected to present at the venue out of 6 graduate students.

- Proposed a framework to generate a large-scale QA dataset consisting of questions, answers and logical forms using existing resources and minimal expert input.
- Used this framework to generate a QA dataset for Electronic Medical Records.
- Characterized the dataset and evaluated various heuristic and neural QA baselines.

ISMB 2019: 27th International Conference on Intelligent Systems in Molecular Biology
"Learning Predictive Embeddings from Heterogeneous Molecular Networks" [in preperation]
Authors: A. Pampari*, Y. Chen* (U. Maryland), M. Leiserson (U. Maryland), J. Peng (UIUC)

- Designing and evaluating a supervised framework to learn topological embeddings for genes by aggregating multiple heterogeneous networks.
- Explore the use of embeddings for various downstream biomedical applications.

CHIIR 2019: ACM SIGIR Conference on Human Information Interaction and Retrieval
"Help Me Search: Leveraging User-System Collaboration for Query Construction" [under review]
Authors: S. Kuzi (UIUC), A. Narwekar (UIUC), A. Pampari, C. Zhai (UIUC)

- Implemented a novel framework where the search engine and the user work together to iteratively reformulate a input query. Method is shown to improve retrieval accuracy for difficult queries.

Awards

Siebel Scholar: $35k awarded annually for academic excellence and demonstrated leadership to over 90 top students from 16 of the worlds leading graduate schools [Press release] *['18]*

Academic Awards

- Academic Excellence Award for ranking 2nd in dept's B.Tech - M.Tech program, IIT Bombay *['16]*
- Undergraduate Research Award for outstanding research contribution, IIT Bombay *['15]*
- Best Research Project Award out of 112 institute wide projects, IIT Bombay *['12]*

Leadership Awards

- Organizational Excellence Award for leading the dept's mentorship body, IIT Bombay *['16]*
- Outstanding Mentorship Honor out of 200 institute student mentors, IIT Bombay *['15]*

Travel Awards

- Tapia Conference Travel Grant: awarded to 3 graduate students from UIUC *['18]*
- Google Conference Travel Grant: awarded to 8 students from graduate schools in USA *['18]*

References

Jian Peng, *Assistant Professor, UIUC* — jianpeng@illinois.edu *[Thesis adviser]*
Max Leiserson, *Assistant Professor, Univ. of Maryland* — mdml@cs.umd.edu *[Collaborator]*
Preethi Raghavan, *Research Staff Member, IBM Research* — praghav@us.ibm.com *[Mentor]*
Madhav Desai, *Professor, IIT Bombay* — madhav@ee.iitb.ac.in *[Thesis adviser]*

Work Experience

Question-Answering: IBM Research, Cambridge, MA *(May'17 - Jul'17)*
Guide: Preethi Raghavan - NLP Researcher, Jennifer Liang - Medical Researcher

Worked on question-answering and semantic parsing, extended work to a submission at EMNLP

Mobile Computing for Image Processing: Rice University, Houston, Texas *(May'14 - Jul'14)*
Guides: Farinaz Koushanfar (ECE): UCSD, Azalia Mirhoseini: Google Brain

Explored the capability of using both mobile GPUs and CPUs (Snapdragon 800 mobile platform) to accelerate a tree matching pursuit algorithm for sparse approximation of image dictionaries.

Research projects

Neural Network Distillation *(May'18 - Ongoing)*
Guide: Jian Peng (CS): UIUC

Developing a novel variant of knowledge distillation architecture to effectively transfer the knowledge from a cumbersome model to a small model that is more suitable for deployment.

Machine Learning in Computational Biology *(Jan'17 - Aug'17)*
Guide: Jian Peng (CS): UIUC

Implemented models to infer the normal (non-cancer) gene cells targeted by cancer therapy drugs

Worked on transfer learning to improve the performance of drug sensitivity prediction in mice where limited data is available

Health-Care Applications on FPGA Hardware *(Jun'14 - Jun'16)*
Guide: Madhav Desai (EE): IIT Bombay

Worked on Improving signal processing performance (acceleration of 10x-30x and power savings of two orders) used for the detection and compression of ECG signals in Arrhythmia diagnostics.

Designed a pipelined hardware architecture that reduces the latency (2x speedup) in Smith Waterman dynamic programming algorithm for accelerating DNA sequence alignment.

Course Projects

- Graph Convolution Networks for Protein Interface Prediction | Bioinformatics | Prof. J. Peng
- Co-reference Resolution using RNNs | Machine Learning | Prof. D. Roth
- Triple Scoring Task, WSDM Cup | Data Mining | Prof. J. Han
- Indoor Localization using WiFi | Computer Vision | Prof. D. Hoiem
- An implementation survey on variants of RNN | Deep Learning | Prof. S. Lazebnik

Graduate Courses

Machine Learning: Machine Learning, Data Mining, Computer Vision (**A+ grade**), Cutting Edge Trends in Deep Learning, Bioinformatics, Advanced Information Retrieval, ML in Computational Biology (**A+ grade**)

High Performance Computing: Advanced Computing, High Performance Scientific Computing, VLSI CAD, Microprocessors, VLSI Design, Digital Systems, Systems Design, Processor Design

Teaching

Graduate Teaching Assistant: 5 semesters at UIUC, 2 semesters at IIT Bombay *(Aug'15 - Dec'18)*

- IIT Bombay: VLSI CAD (EE677) & Digital Electronics (EE224)
- UIUC: Bioinformatics (CS466), Intro. to Computing (CS101) & Discrete Mathematics (CS173) [**UIUC list of teachers ranked excellent**]

Senior Academic Mentor, Counselling Service, IIT Bombay: 4 semesters *(Aug'14 - May'16)*

- Conducted remedial classes for CS and EE courses for peers needing academic help

Leadership

Head of Department Academic Mentorship Program, DAMP'15 *(Aug'15 - Aug'16)*

- Led a team of 17 mentors (interviewed 80 applicants) to help students facing difficulties with academic load - feedback showed 95% students showed significant grade improvements
- As a part of dept. committee, involved in restructuring undergraduate curriculum
- Enhanced faculty-student and counsellor-student interactions in the dept. by various initiatives

Technical Innovator, MIT Health Technology Camp *(Jun'15 - Jul'15)*

- Worked closely with Ocularist's at L.V Prasad Eye institute
- Manufactured *'Hydro-Pro'*, a solution to help speedup prosthetic eye cleaning

Robotics Club Coordinator *(Aug'12 - Aug'13)*

- Part of a 8 member team which led all Robotics Club activities at the university
- Organized Technical General Championships and Inter-Hostel robotic events
- Imparted technical knowledge by organizing workshops, industrial visits and guest lectures