ARIJIT PRAMANIK

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EDUCATION

UNIVERSITY OF WISCONSIN-MADISON

Masters in Computer Science
Aug.2019-May.2021 (Expected)

IIT BOMBAY, INDIA

B.Tech. in Computer Science and Engineering (With Honors)
Jul.2015-Jul.2019
Cum. GPA : 9.21 / 10
Minor in Statistics
Semester Exchange at National Univ of Singapore (NUS) (GPA: 4.92 / 5)

KEY COURSEWORK

Machine Learning
Advanced Image Processing
Information Retrieval
Big Data Systems
Advanced Operating Systems
Computer Vision
Artificial Intelligence
Computer Graphics

TECHNICAL SKILLS

Proficient-
•C/C++ •Python •MATLAB •Java
•Docker •P4 •SQL •Bash •GIT •LaTeX
Familiar-
•Scala •Javascript •Pytorch •OpenGL
•Spark/Hadoop •HTML/CSS •Django
•Android •OCaml •Racket •R/SAS

PATENTS & PUBLICATIONS

"Abstractive Text Summarization tailored to target characteristics"
K. Chawla, H. Singh, A. Pramanik, M. Kumar & B. V. Srinivasan
CICLING 2019

"Method to generate a target-characteristic tuned content using a word generation model"
A. Pramanik, H. Singh, M. Kumar, B. V. Srinivasan & K. Chawla
Filed at USPTO in Jan 2019

ACHIEVEMENTS & AWARDS

- **Institute Academic Prize** : Dept. Rank 1 in 3^{rd} year (GPA : 9.86 / 10)
- **Cohort top 1%** in Information Retrieval, Optimization & Numerical Analysis
- **Teaching Assistant**: Computer Graphics, Programming & Computer Architecture
- **Institute Sports Citation**: Extraordinary contribution to Aquatics (4 gold, 5 silver & 11 bronze) and **Aquatics Captain** [2019]

KEY INTERNSHIPS

HARDWARE ACCELERATION OF PROXIES | Research Intern

Summer 2019 | University of Washington | Guide: Prof. Arvind Krishnamurthy

- Worked on Layer 4 and 7 load balancing of different proxies like **Envoy**, **Nginx** & **HAproxy** to demarcate functionalities for host and SmartNIC offloading
- Performed benchmarking experiments using **wrk** to determine feasibility of SSL checksum offloading and scalability, with a detailed study of Envoy workers

CHARACTERISTICS-DRIVEN SUMMARIZATION | Research Intern

Summer 2018 | Adobe Research Labs | Guide: Dr. Balaji Vasan Srinivasan

- Adapted Facebook AI Research's **convolutional seq2seq** model for feature-driven text generation on *pointer-generator* framework with modified **attention layers** to focus on specific input text embeddings for topic-tuned summaries
- Altered **beam search paradigm** for enhancing decoder state induced word-level features with **token-based learning** for length constrained summarization
- Achieved a 6.4% increase in ROUGE scores with **Reinforcement Learning**

RESEARCH

RAMAN SPECTROSCOPIC IMAGING | Bachelor's Thesis

Jul.2018-May.2019 | IIT Bombay, India | Guide: Prof. Ajit Rajwade

Devised an **inpainting** method to enable compressed sensing and **super-resolution** of Raman spectral images to speedup acquisition, leveraging **Gaussian Mixture Models** and **Blind Dictionary Learning**. Implemented **Non-Negative Sparse Coding** for source separation use case of removing paraffin signature from preserved tissues

STATE REPLICATION & FAULT TOLERANCE IN P4 | RnD Project

Jan.2019-May.2019 | IIT Bombay, India | Guide: Prof. Mythili Vutukuru

Constructed a **synchronous** cum **asynchronous** write-consistent bmv2 model to store network states on the switch itself with **consistent migration** across backup switches in the **data plane**. Achieved faster flow switchover compared to **controller-mediated** state updates. Proposed an annotation based API for a generalized module

KEY PROJECTS

TETRISBOT | Artificial Intelligence

Designed a **utility-based** agent using **genetic algorithms** and **particle swarm optimization** for optimal convergence of weights, clearing over 856,000 rows. Implemented an auto-encoder with **Q-learning** for a low dimensional state space

JAVA-LIKE COMPILER FOR OCAML | Impl of Programming Langs

Designed the **EBNF abstract syntax tree** & VM instruction **interpreter** with **Hindley Milner** type inference system. Implemented conditionals, functions, applications, let constructs, **tail recursion** using contiguous stack frames with abstraction for monads

LEGAL CASE RETRIEVAL SYSTEM | Information Retrieval

Designed a freetext search engine to rank legal case judgments (2^{nd}/33 teams) with **positional indices** for proximity search and **zone** & **field indices** like court hierarchy, date. Enhanced F_1 score using **query expansion**: **pseudo-relevance feedback** with **Rocchio formula**, WordNet synonyms and **tf-idf** weighted co-occurrence thesaurus

STEREO RECONSTRUCTION | Computer Vision

Obtained dense correspondences using *KLT tracker* to estimate **Fundamental matrix** by **8-point algorithm**. Employed **PatchMatch** algorithm for image quilting and demosaicing of homographic images. Implemented **normalized graphcuts** with α-expansion for segmentation using **multilabel Markov Random Fields**