

# 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  
Computer Networks  
Databases & Information Systems  
Advanced Operating Systems  
Artificial Intelligence  
Advanced Image Processing  
Information Retrieval  
Computer Vision

## TECHNICAL SKILLS

Proficient-

•C/C++ •Python •MATLAB •Java  
•Docker •P4 •SQL •Bash •GIT • $\text{\LaTeX}$

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<sup>rd</sup> 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 | SUMMER INTERN

Summer 2018 | Adobe Systems | 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

### DATAPLANE-ONLY POLICY-COMPLIANT ROUTING | IND. STUDY

Aug.2019-Ongoing | UW-Madison | Guide: Prof. Aditya Akella

Devised a routing mechanism on programmable switches in P4 that uses search algorithms to compute the route in the data-plane without controller intervention. Handled failures through register updates utilizing failure packets in Tofino. Supports policies like middlebox-chaining, flexible WCMP with hierarchical routing

### 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

### 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

## 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<sup>nd</sup>/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