ARIJIT PRAMANIK

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EDUCATION

UNIVERSITY OF WISCONSIN-MADISON
Masters in Computer Science
Aug '19 - May '21 (Expected)
GPA : 3.88 / 4

IIT BOMBAY, INDIA
B.Tech. in Computer Science and Engineering (With Honors)
Jul '15 - May '19
GPA : 9.21 / 10 (Minor in Statistics)
Semester Exchange at National Univ of Singapore (NUS) (GPA: 4.92 / 5)

KEY COURSEWORK
Advanced Computer Networks
Advanced Operating Systems
Big Data Systems
Databases & Information Systems
High-Performance Computing
Machine Learning & Artificial Intelligence
Information Retrieval
Computer Vision & Image Processing
Information Security

TECHNICAL SKILLS
Proficient-
•C/C++ •Python •MATLAB •Java
•Docker •P4 •SQL •Bash •Git •LaTeX
Familiar-
•Scala •Javascript •Pytorch •SmartNIC
•Spark/Hadoop •HTML/CSS •Django
•Go •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"
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**: Aquatics champion (4 gold, 5 silver & 11 bronze) and **Aquatics Captain** (2018-19)

KEY INTERNSHIPS

SANDBOXING OF UNTRUSTED PROCEDURES | SDE Intern
Summer `20 | AWS Relational Database Service | Guide: Jignesh Shah

- Integrated an open-source extension PL/Container into PostgreSQL 12 and 13 to enable sandboxed execution of stored procedures inside Docker containers
- Ran performance benchmarking to identify bottlenecks in Unix sockets & grpc channels to maintain latency at par with locally running extensions
- Developed a new prototype to use a single container across all customers with a 63% memory usage reduction, while scaling to thousands of connections
- Added runtime support for Go language and created 3 separate extensions for R, Python and Go, utilizing separate containers for better isolation

CHARACTERISTICS-DRIVEN SUMMARIZATION | Research Intern
Summer `18 | 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.`19 - Dec `19 | 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 `19 - May `19 | IIT Bombay | 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

ACTIVE NETWORK TRAFFIC SCHEDULING | Adv. Networks
Leveraged count-min sketches within limited memory in P4 switches using register arrays to identify flows contributing to queue-buildup. Tested prototype scaling across millions of simultaneous flows on mininet with ECN feedback to violating senders. Achieved a net reduction in Flow Completion time with this approach

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

PARALLELIZED IMAGE SEGMENTATION | High Perf. Computing
Accelerated Canny edge-detection and Fuzzy C-Means clustering leveraging GPU and hybrid OpenMP+MPI on multicores. Explored SIMD, use of templates and forced inlining with shared and unified memory. Utilized CUDA streams, dynamic parallelism and thrust library along with OMP tasks to achieve high speedup