Ram Sharan Chaulagain

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Education

Ph.D. in Computer Science Aug, 2018 – Present

Florida State University, Tallahassee, FL *Advisor: Dr. Xin Yuan*

Bachelor's in Computer Engineering 2017

Tribhuvan University, Nepal

Experiences

Research Assistant Aug, 2018 – Present

Florida State University, Tallahassee, FL

- Analyzed traffic patterns of HPC (Lammps, Nekbone, Milc) and Deep Learning (Cosmoflow) applications at the interconnect level. Developed an SDN-based routing scheme tailored to these patterns for the Dragonfly interconnect fabric.
- Enhanced UGAL routing scheme improving the accuracy of the latency estimation for UGAL with local information showcasing proactive mitigation of the potential network congestion with imbalanced network traffic.
- Implemented traffic patterns, routing, topologies, and other network parameters to study HPC interconnect performance on the Booksim and CODES (interconnect simulators).

Research Aide May 2019 – Aug 2019, May 2020 – Aug 2020

Argonne National Lab, Chicago, IL

- Conducted research on implementing a deep-learning-based routing algorithm matching existing theoretical routing (UGAL-G) with 6% improvement over existing state of the art UGAL-L routing algorithm for adversarial traffic pattern and published a research poster in SuperComputing Conference 2020.
- Conducted research on congestion characteristics and mitigation in dragonfly topology to understand routing performance using an interconnect simulator designed by Argonne, visualizing head of line blocking and the flow of packets on network links with different injection loads.
- Implemented a counter to maintain average wait time of packets in the router's buffer for a simulation study, enabling detection of global link congestion from the local router before back-pressure of the flow.

Research Intern May 2017 – June 2017

Grow By Data, Kathmandu, Nepal

- Conducted research on Web Scraping Techniques to extract the webpage contents using multiple nodes parallelly with Xpath and CSS selector .

Selected Publications

- **Chaulagain RS**, & Yuan, X. (2024, May). Enhanced UGAL Routing Schemes for Dragonfly Networks. In Proceedings of the 38th ACM International Conference on Supercomputing (pp. 449-459).
- **Chaulagain RS**, Liza FT, Chunduri S, Yuan X, Lang M. *"Achieving the Performance of Global Adaptive Routing using Local Information on Dragonfly through Deep Learning."* ACM/IEEE SC tech poster. 2020 Nov.
- **Chaulagain RS**, Pandey S, Basnet SR, Shakya S. *"Cloud based web scraping for big data applications."* In2017 IEEE International Conference on Smart Cloud (SmartCloud) 2017 Nov 3 (pp. 138-143). IEEE.

Programming Skills

Languages: Python, C / C++

Infrastructure tools: Docker, Git, MySQL, Terraform

Data analysis: SQL, Excel, Scikit-learn, Pandas, PyTorch, TensorFlow

Coursera Certifications: Fundamentals of Reinforcement learning

Others: AWS, Linux scripting, MPI, OpenMP, Microcontroller programming, LaTeX, Netica, Linden Scripting

Selected Projects

- Deployed scalable deep learning based stock prediction application on **AWS servers using Terraform.**
- Designed a parallel Web Scraping system using **Selenium, XPath, and CSS selector** at its core to extract the webpage contents and deployed them in AWS nodes.

Leadership and Awards

Outstanding Research Assistant Award 2024