Computing and Information Science
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Research Interests

With growing interest towards decentralized infrastructure, Blockchain has enabled building a tamper-proof distributed public ledger in the face of untrusted parties. In particular, Bitcoin and smart contract platforms (e.g. Ethereum) have been used tremendously in financial industry and decentralized applications. These systems, however, require significant wasteful computation and incur large transaction latency. In contrast, traditional byzantine consensus protocols achieve fast finality and require minimal computation. I am interested in designing (1) low-latency scalable byzantine consensus protocols (2) using byzantine consensus protocols to replace expensive Proof-of-Work mechanism to create scalable and energy efficient blockchain designs.

Education

2017–present **Ph.D. computer science**, *Rochester Institute of Technology*, Rochester, NY, USA.
Advisor: Mohan Kumar, GPA: 3.86

2009–2013 **B.E. Electronics and Communication Engineering**, *Tribhuvan University*, Lalitpur, Nepal.
GPA: 3.81

Professional Employment

2017-present **Graduate Research Assistant**, *Rochester Institute of Technology*, Rochester, NY.
Currently researching on efficient Almost surely terminating asynchronous byzantine agreement protocols.

2015-2017 **Freelance Software Developer**, *Upwork Global Inc.*, Cambridge, MA.
Worked as an Elasticsearch consultant; working in various large scale web-application using Django as web backend and Elasticsearch as search backend

2016-2017 **Senior Software Engineer**, *FFL Design Inc.*, Meridian, ID.
Built E-commerce applications for shooting sports industry

2017 **Senior Software Engineer (part-time)**, *DjangoForce LLC*, Boise, ID.
Built back-end for ScanFactor.com–a career fair software

2014-2015 **Senior Software Engineer**, *n.Locate Pvt. Ltd.*, Lalitpur, Nepal.
Built local search engine for places, movies, etc using Elasticsearch as the backend

2013-2014 **Design Engineer**, *Real Time Solutions*, Lalitpur, Nepal.
Worked with LUFA, LWIP stack in Free-RTOS.

Projects

Fault Tolerant Key Value Store.
A distributed key value store made fault-tolerant using Raft consensus protocol. Requires $2f+1$ servers to tolerate f crash failures in the system.

AI-Pollo: Mixed Reality Theatre.
A HoloLens application that dynamically anchors holograms to different world positions based on an external control application. Multiple hololens can view same shared environment.

FPGA Implementation of Stereo Vision.
Image disparity computed with corelation between two imags from identical cameras and disparity map dispalyed in a monitor. Spartan 3A DSP borad and VHDL languge used to program the system

USB based oscilloscope.
USB oscilloscope using ADC module in Atmega8. GUI Interface made in C++ to view signals.

Awards and Honors

2017-present **RIT PhD Merit Scholarship**.

2009-2013 **The College Fellowship Scholarship**.
Tuition waiver for 4 years of undergraduate studies for BE in Electronics and Communication Engineering

Skills

Programming Languages.
TLA+, GoLang, Python, SML, Java, Scala, Matlab, VHDL, C++, C, C#, Javascript, PHP

Frameworks.
Django, Falsk, Spark

Databases.
Elasticsearch, Mysql, Postgresql, MongoDB, Sqlite

References

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