# Sankalpa Timilsina

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## Education

**Tennessee Technological University** **August 2021 – December 2023**
*Masters in Computer Science* *Cookeville, Tennessee*

**Institute of Engineering Pulchowk Campus** **May 2012 – January 2017**
*Bachelors in Computer Engineering* *Kathmandu, Nepal*

## Work and Research

**Los Alamos National Laboratory** **May 2023 – August 2023**
*Intern* *Los Alamos, New Mexico*
Named Data Networking (NDN) is a proposed future internet architecture focusing on content-centric security. To address security gaps of IP-based Industrial Control Systems (ICS), I built a virtual testbed for ICS with NDN networking.

- Wrote a Python based library which alongside a router demonstrates the possibility of using NDN in ICS with Programmable Logic Controllers (PLCs)
- Presented poster at the lab's Annual Student Symposium 2023

**Tennessee Technological University** **August 2021 – Present**
*Graduate Research Assistant* *Cookeville, Tennessee*
The NDN community lacks real-world experimental network traffic traces and traffic analysis tools. To solve this:

- Developed a systemd service to automate the capture of NDN traces from wide-area NDN testbed
- Developed trace analysis, and replay tools with Python and C++

To address the need of a scalable platform in the genomics communities to aggregate dispersed datasets:

- Built a Kubernetes Data Lake with NDN network on FABRIC research infrastructure

To provide the scientific research communities an automated platform for experimenting and hosting their datasets:

- I am building a generic NDN and Kubernetes platform which provides fully automated data and compute lake creation with Python, NDN and Kubernetes

## Industry Experiences

I have more than 5 years of experience as a software engineer. Recent positions:

**Outcode Software LLC** | *Lead Software Engineer* **October 2020 – July 2021**

- https://foodtruckleague.com a service headquartered at Utah provides a digital platform for hosting food truck events to the local community
- I lead the DevOps project in addition to handling the project hosting on AWS
- Tools: AWS EKS, ECR, Docker, Django, Wordpress, React, Nginx

**Insight Workshop** | *Lead Software Engineer* **November 2019 – October 2020**

- Lead and built the learning and training platform for aspiring web developers. It trains the developers on programing languages and communication skills (https://levelup.com.np)
- Tools: AWS, Django

**Eagle Vision IT** | *Software Engineer* **January 2017 – November 2019**

- To address production bugs, I built a custom logging and notification system based on Node JS and ELK stack
- https://bgjobfinder.jp, a bilingual (EN, JP) portal is an active job portal for seekers and recruiters and was built with microservices architecture. I was one of the primary contributors
- https://5spades.com, a betting site for sports uses GraphQL endpoints and shows real-time sport updates. I handled the project individually from planning to building to deployment
- Tools: AWS EC2, S3, Route53, Cloudfront, Sails JS, Nginx, Cronjobs

## Technical Skills

**Languages**: Python, Javascript, C++, PHP, Bash
**Technologies**: Node JS, Django, Angular, AWS, GCP, GraphQL, REST, Nginx, Apache, Docker, Kubernetes, Wordpress
**Database**: MySQL, MongoDB, Elasticsearch, PostgreSQL, Redis
**Other**: Clickup, Trello, Git

## PUBLICATIONS, TECHNICAL PAPERS, TALKS

- Capture and Analysis of Traffic Traces on a Wide-Area NDN Testbed *Timilsina, et al. "Capture and Analysis of Traffic Traces on a Wide-Area NDN Testbed", ACM Conference on Information-Centric Networking, 2023., (Accepted, to appear)*
- N-DISE: NDN-based data distribution for large-scale data-intensive science *Wu, Yuanhao, Faruk Volkan Mutlu, et al. "N-DISE: NDN-based data distribution for large-scale data-intensive science." In Proceedings of the 9th ACM Conference on Information-Centric Networking, pp. 103-113. 2022.*
- Building an Industrial Control System Testbed and Application Library over Named Data Networking *Timilsina, et al. "Building an Industrial Control System Testbed and Application Library over Named Data Networking", Industrial Control System Security Workshop, 2023. (Under submission)*
- Utilizing NDN-DPDK for Kubernetes Genomics Data Lake *Timilsina, et al. "Utilizing NDN-DPDK for Kubernetes Genomics Data Lake"*
- Genomics Data Lake, Kubernetes and NDN: SuperComputing 2022 *SuperComputing Workshop, Dallas, Texas, 2022*