

# Nussara (Firn) Tieanklin

COMPUTER SCIENCE RESEARCHER · DATA SCIENCE FOR SOCIAL GOODS · RURAL COMMUNITY NETWORKS · TEACHING ASSISTANT

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## Education

### University of Washington

Washington, U.S.A

PH.D. IN COMPUTER SCIENCE AND ENGINEERING (ADVANCED DATA SCIENCE OPTION)

June 2021 - Present

Advised by Prof. Kurtis Heimerl

Affiliated to Information and Communication Technology for Development (ICTD) Lab

BACHELOR OF COMPUTER SCIENCE AND SYSTEMS (CSS HONORS) WITH A MINOR IN INFORMATICS

September 2017 - June 2021

Honors thesis: *Deep Model Compression* advised by Prof. Juhua Hu

In-major GPA: 3.84 | 2019 - 2021 Annual Dean's List

## Skills

<b>Research Interests</b>	Data Analytic/Visualization, Mixed Methods Research, Community-owned Cellular Networks
<b>Softwares/Libraries</b>	PyTorch, Colab, TensorFlow, scikit-learn, D3.js, Tableau, NumPy, Pandas, Web Services, Git, Postgres, Heroku, AWS, Node.js, APIs, Shiny, UNIX, bash, Android Studio,
<b>Languages</b>	Python, Java, Java JS, SQL, C, R, HTML/CSS

## Publications

### The Effect of Air Pollution on the Motorcycle-Taxi Grab Workers in Southeast Asia

2022

Nussara Tieanklin, Joseph Breda, Kurtis Heimerl

Work In Progress

### Participant Observation Study on Community Network Mobilization

2022

Nussara Tieanklin, Joseph Breda, Kurtis Heimerl

Work In Progress

### Menopause Legacies: Designing to Record & Share Menopause Experiences Across Generations

2022

Shaan Chopra, Katherine Juarez, Lisa Orii, Nussara Tieanklin

Work In Progress

### Air Pollutions in Ports

July 2022

Nussara Tieanklin

nussaraafir.github.io/air-pollutions-in-ports

### mtunzi: a programmable approach to software-defined network access control and captive networking for low-resource setting

December 2021

Innocent Ndubuisi-Obi Jr, Nussara Tieanklin

nussaraafir.github.io/mtunzi

### The Low Impact of COVID-19 on Rural Community Network Traffic

June 2021

Nussara Tieanklin, Matthew Johnson, Kurtis Heimerl (ACM COMPASS 2021)

dl.acm.org/doi/10.1145/3460112.3472311

### Weight-Based Deep Model Compression of DGA Detectors for Small Devices

June 2021

Nussara Tieanklin (Computer Science & Systems Honors)

## Work Experience

### Graduate Researcher & Undergraduate Researcher

March 2019 - Present

INFORMATION AND COMMUNICATION TECHNOLOGY FOR DEVELOPMENT (ICTD) LAB AT PAUL G. ALLEN SCHOOL (CSE)

- Applies mixed-methods research to analyze how the air pollution impacts motorcycle-taxi Grab workers' strategies and income in Southeast Asia. (in partnership with Grab Holding Inc.)
- Collaborate in community outreach, equipment deployment, and troubleshooting on the open-sourced Community Cellular (LTE) Network project to bring affordable high-speed connectivity to lower-income neighborhoods in South Seattle and Tacoma area.
- *mtunzi*, a system for software-defined network access control and captive networking aimed toward the networking needs of small WISPs and community network operators.
- Analyze the impact of COVID-19 on the Community Cellular Networks's internet traffic and transactions in Bokondini, Indonesia. (ACM COMPASS'21)

SCHOOL OF ENGINEERING AND TECHNOLOGY (UWT)

- Interpret decision making behind Deep Learning models and decompress in order to have them operate in IoT devices efficiently, such as mobiles and tablets, to detect and block Domain Generation Algorithm (DGA) malwares with Infobox company under supervision of Prof. Juhua Hu.

### Research Intern for Aarhus City Lab

May 2022 - July 2022

DOKK1 AT ÅRHUS, DENMARK

- Applied Data Science practices analyzing the impact of cruise emissions and used Deep Learning for time series forecasting on the air quality of the second largest city of Denmark, Århus.
- This work is a collaboration with the Aarhus City Lab team, ITK department at DOKK1 (Århus, Denmark). A media coverage for the work: [itk.aarhus.dk/nyheder/projektnyheder/krydstogtskibe/cruise-ships/](https://itk.aarhus.dk/nyheder/projektnyheder/krydstogtskibe/cruise-ships/). More information, please visit [github.com/nussaraafir/aarhus-aqi](https://github.com/nussaraafir/aarhus-aqi).

## Graduate & Undergraduate Teaching Assistant

September 2020 - Present

PAUL G. ALLEN SCHOOL OF COMPUTER SCIENCE & ENGINEERING

- Assist Prof. Jeffrey Heer and Prof. Leilani Battle with lesson plans for the *Data Visualization* class. Instructing the class requires TAs to be proficient in using D3.js, web programming, Tableau, and observable notebooks. Other tasks includes but not limited to holding office hours, instructing small groups of students, and providing feedback/help on assignments for classes of 120 students.

SCHOOL OF ENGINEERING AND TECHNOLOGY (UWT)

- Teach materials and construct exercises for Data Structures, Discrete Math, and Object-Oriented Programming classes.

## Undergraduate Tutor

September 2019 - February 2020

INFORMATION SCHOOL AT UNIVERSITY OF WASHINGTON

- Teach students one-on-one with more than 200 students especially disadvantaged and limited coding experienced students and work collaboratively with iSchool professors to improve contents for Intro to Data Science, Web development, Databases and Server-Side Development course.

## Data Science Intern

July 2018 - August 2018

AERONAUTICAL RADIO OF THAILAND AT BANGKOK THAILAND

- Collaboratively working on optimizing airspace usage with data scientists and engineers in Air Traffic Flow Management (ATFM) Team to balance the air traffic demand of Thai airspace capacity.
- Analyze, forecast, and visualize the possible delays on each routes on over millions flight data using data mining and visualization skills and various tools including but not limited to Tableau and advanced Excel formulae.
- Successfully able to identify congested routes and the causes of delay, which have been further handled by the team accordingly.

## ThaiSA Vice President

June 2018 - June 2019

THAI STUDENTS ASSOCIATION (THAIS) AT UNIVERSITY OF WASHINGTON

- Organize 12 Thai cultural events with more than a thousand attendees, delegate and follow up undertaken duties along with support about 300 Thai Student community for their cultural and academic adaptation. More information about the events please visit <http://tinyurl.com/thaisauw>

## Projects

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### mtunzi: Software-defined Network Access Control for Small Networks

[GitHub Repository](#)

RESEARCHER AND NETWORK ENGINEER

September 2021 - January 2022

- mtunzi* is a system for software-defined network access control and captive networking aimed toward the networking needs of small WISPs and community network operators. The system uses Openflow as a communication protocol and freeRADIUS server authentication process, both run on Mininet (i.e. network emulator). The captive portal uses flask application.
- Collaboratively design the flask app portal and software-defined approach to register and authenticate switches, authenticate hosts & users, and dynamically manage hosts & users.

### Microsoft Malware Detection for UW Informatics x Microsoft Corp.

PROJECT LEADER AND DATABASE ANALYST

January 2020 - March 2021

- Lead the team to build normalized database model, drafting the entity relationship diagram (ERD), and investigate the top 5 devices, characteristics that are prone to get infected by analyzing over eight million rows of real data representing the malware-infected devices.
- Collaboratively design normalized and highly optimized database containing only business related to meet the needs using advanced SQL and high-level database management. Microsoft SQL Server is the main software. The data analysis was done in Python.

### PathDeck: COVID-19 Health Tracking Application

[GitHub Repository](#)

FULL-STACK MOBILE APPLICATION DEVELOPER

June 2020 - August 2020

- Is an application allows users to track their health, locations, activities, and notify people in contact quickly if they get infected. However, this application can also serve as a note taking or daily planner application. More information about features please visit the GitHub repository.
- Contributed mainly as a full-stack developer together with Kieu Trihn using Android environment, Postgres, Heroku, Figma, SQL, JavaScript and Java. The demo video can be found at [youtu.be/oJ3nPrunM60](https://youtu.be/oJ3nPrunM60)

### NutriBites: On-Demand Campus Dining Service at DubHacks 2019

[GitHub Repository](#)

FRONT-END DEVELOPER

October 2019 - October 2019

- A software prototype for tight-schedule students to pre-order campus nutritious food online. The features include utilizing the calendar API and ML to automatically ordering lunch based on availability, behavioral analysis of orders, and coin-earning system from consuming healthier food or delivering for their schoolmates as an incentive.
- Contributed on the prototype of platform collaboratively from brainstorming ways to differentiate NutriBites from other student-run food services and developed front-end using Bootstrap, HTML, CSS, and JavaScript.

### Chicago Crime Data Visualization

[GitHub Repository](#)

PROJECT LEADER AND DATA VISUALIZATION DEVELOPER

June 2019 - August 2019

- Is a shiny application for interactive data visualization using crime datasets in Chicago over the past 10 years to inform locals and tourists about the locations and areas, crime types, and timeline that crimes were committed.
- Designed and implemented mainly on the interactive heatmap showing crime distribution in different time/area using data exploration and visualization skills in advanced R and HTML/CSS language.

## Selected Media Coverage

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### From Seattle to Aarhus: Investigating how cruise ships affect air quality

August 2022

[itk.aarhus.dk/nyheder/projektnyheder/krydstogtskibe/cruise-ships/](https://itk.aarhus.dk/nyheder/projektnyheder/krydstogtskibe/cruise-ships/)

### Photo Essay: A view into a Tribal Broadband Bootcamp

March 2022

[muninetworks.org/content/photo-essay-view-tribal-broadband-bootcamp](https://muninetworks.org/content/photo-essay-view-tribal-broadband-bootcamp)

## Courseworks

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Data Visualization

Human Computer Interaction (HCI)

Design Methods - User Interface Design

Deep Learning

Machine Learning

Databases & Data Modelling

Computer Networks & Systems

SW Development& QA Techniques

Mobile Application Development

## Scholarships

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### Royal Thai Scholarship

*June 2017 - Present*

FUNDED BY AERONAUTICAL RADIO OF THAILAND (AEROTHAI)

- Received a full financial support of \$400,000 to study Bachelor's and Master's Degree in the United States.

### Long Term Exchange Program (LTEP) Scholarship

*September 2012 - July 2013*

FUNDED BY ROTARY INTERNATIONAL DISTRICT 3350

- Received a scholarship of \$65,000 to attend a year-long program studying in Dover Bay Secondary in British Columbia, Canada to learn both academically and culturally.

## Honors & Awards

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2021 **Annual Dean's list 2019-2021**, University of Washington High-scholarship award

*Seattle, WA*

2016 **Student of The Month as a Communicator**, Student Recognition Ceremony

*New Hampton, NH*

2014 **Gold Medal**, ASEAN Community English Debate Contest

*Chiang Mai, Thailand*

2014 **Gold Medal**, English Skit Competition at 63rd National Student Arts and Crafts Competition

*Phetchabun, Thailand*

## Conferences

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### Grace Hopper Celebration (vGHC) 2021

*September 2021*

*vGHC'21 scholarship recipient from Paul G. Allen school*

### Richard Tapia Celebration of Diversity in Computing (TAPIA) 2021

*September 2021*

*TAPIA'21 scholarship recipient from Paul G. Allen school*

### ACM COMPASS 2021

*June 2021*

*Workshop Presenter*