Elizabeth A. Ondula

EDUCATION

Ph.D in Computer Science
University of Southern California
AUG 2018 - 2024 (expected graduation date)

B.Eng (Electrical and Electronics Engineering)
Technical University of Kenya
MAY 2010 - AUGUST 2014

RESEARCH EXPERIENCE

Research Assistant
Viterbi School of Engineering, University of Southern California
AUG 2020 - MAY 2021

Studying and implementing reinforcement learning based tools to address decision problems in the education, agriculture and supply-chain domains.

IBM Research (Analog AI) -
JUN 2021 - AUG 2021

Using IBM's Analog AI toolkit, I worked on hyperparameter optimization and parallelizing hardware-aware training for different deep neural network architectures.

IBM Research Africa, Nairobi, Kenya - Research Software Engineer (IoT + Blockchain)
JULY 2017 - JULY 2018

I worked on implementing an access control system using blockchain and user interface design and experience for a healthcare wallet application.

ENGINEERING, LEADERSHIP AND GOVERNMENT EXPERIENCE

Diaspora AI - Co-Founder + CTO
JULY 2018 - DEC 2020
https://diasporaai.com/

Taskforce Member
Ministry of ICT, Innovation & Youth Affairs
March 2018 - July 2019

Brave Venture Labs, Nairobi, Kenya - Head of Product Development
NOVEMBER 2016 – JUNE 2017

- Managed the design, development and processes definition of a recruiting system that leverages artificial intelligence techniques for job matching.

IBM Research Africa, Nairobi, Kenya - Software Engineer (IoT + AI)
AUGUST 2014 - OCTOBER 2016.

- Design and development of a conversational agent for providing watering recommendations to small-scale farmers in Tharaka Nthi, Kenya. This work also included the development of a model for crop water-stress prediction. Implemented a tool using low-cost soil moisture sensors for measuring plant water-stress.
- Designed and developed UI/UX flows as well as mobile and web applications
- Mentored software developer interns.

IBM Research Africa, Nairobi, Kenya - Software & Hardware Engineering Intern
MAY 2014 - JULY 2014

- Implemented a financial investment mobile application. This included conducting user studies, analyzing financial investment options in Kenyan and designing a user interface and experience for the application.
- Designed and fabricated a water level sensor. The sensors were then deployed to monitor water usage in both urban and rural Kenya

iHub - Technology Innovation Community, Nairobi, Kenya - Co-Lead R&D Group
NOVEMBER 2013 - MARCH 2014

- Curated and designed the curriculum for the first kids' robotics workshop in the space.
- Facilitated over 10 workshops for hardware and robotics enthusiasts in Nairobi.
- Designed and fabricated a low-cost frame for a quadcopter.
- Prototyped a low-cost educational robot that won Ultra Robotics Challenge, IEEE in 2013

TEACHING EXPERIENCE

- Database Systems - Masters level (USC)
  Summer 2020, Fall 2020

- **Strathmore University** - Guest Lecturer (M2M Communications)
  2016 - 2017
  Internet of Things Architecture, Programming Hardware devices and developing Cloud Applications - Masters level

- **Technical University of Kenya -** Robotics Lab Assistant
  2013-2014
  I developed robotic training kits used for lab sessions for Robotics unit for

PATENTS

- Weldemariam, K., Kozloski, J.R., Gordon, M.S., Vukovic, M. and **Ondula, E**., International Business Machines Corp, 2020. *Automated task management on a blockchain based on predictive and analytical analysis*. U.S. Patent Application 16/019,630.
- Fleming, K., Wambua, M., Kotin, T., **Ondula, E**. and Weldemariam, K., International Business Machines Corp, 2019. *System and method for creating and managing intelligent water points in resource constrained regions*. U.S. Patent 10,319,051.
- Fleming, K.K., **Ondula, E.A**., Samuel, L. and Weldemariam, K.S., International Business Machines Corp, 2020. *Predicting crop productivity via intervention planning on small-scale farms*. U.S. Patent 10,772,269.
- Weldemariam, K., **Ondula, E**., Bore, N.K. and Kwatra, S., International Business Machines Corp, 2020. *Simplifying electronic communication based on dynamically structured contact entries*. U.S. Patent Application 16/197,492.
- Wambugu, I.W., **Ondula, E.**, Ogega, V., Nyota, T., Kwatra, S. and Weldemariam, K., International Business Machines Corp, 2020. *Maintaining voice conversation continuity*. U.S. Patent Application 16/132,023.

PUBLICATIONS

- Fleming, K., Waweru, P., Wambua, M., **Ondula, E.** and Samuel, L., 2016. Toward quantified small-scale farms in africa. *IEEE Internet Computing*, *20*(3), pp.63-67.
- Zeni M, **Ondula E**, Mbitiru R, Nyambura A, Samuel L, Fleming K, Weldemariam K. Low-power low-cost wireless sensors for real-time plant stress detection. InProceedings of the 2015 Annual Symposium on Computing for Development 2015 Dec 1 (pp. 51-59).
- Fleming K, Kouassi A, **Ondula E**, Waweru P. Toward farmer decision profiles to improve food security in Kenya. IBM Journal of Research and Development. 2016 Sep 30;60(5/6):6-1.
- Tirupathi S, McKenna SA, Fleming K, Wambua M, Waweru P, **Ondula E**. Digital Aquifer-Integrating modeling, technical, software and policy aspects to develop a groundwater management tool. InAGU Fall Meeting Abstracts 2016 Dec (Vol. 2016, pp. H53C-1729).
- Samuel L, **Ondula E**, Wambua M, Fleming K. Small-scale farming optimization using frugal plant-based irrigation scheduling in Kenya. InAGU Fall Meeting Abstracts 2015 Dec (Vol. 2015, pp. GC53G-1300).

VOLUNTARY SERVICE

SuperComputing 2021
As a committee member, my role was to judge artifact descriptions during the paper submission and evaluate artifacts of accepted papers.

Journal of Systems Research
Artifact Evaluation Board member

MENTORSHIP

Women in Engineering (University of Southern California**)** - Mentor
Fall 2021

Viterbi Summer Institute (Viterbi School of Engineering**)** - *Research* Mentor
Summer 2020

Project: AI tools design and development to address misinformation that causes social threats on the web.
Outcome: https://www.youtube.com/watch?v=7TghvBY_Z4Q

Viterbi Mentorship Program (University of Southern California**)** - Mentor
DEC 2018 - MAY 2018
Assigned two international Masters students to assist with orientation and needs for better transition to graduate school life.

Discovery Project, USC
Summer 2019

IBM BlueHack Jamaica (IBM**)** - Technical Mentor (Blockchain, AI and Design Thinking)
NOV 2017
Worked with over 70 university students, young professionals and start-ups in Jamaica to develop viable prototypes to solve business and societal challenges using Blockchain and Artificial Intelligence technologies.

Foondi Workshops - Mentor
JAN 2017 - JULY 2018
Facilitate the electronics training program on the use of basic electronics and smart (internet of things - IoT) devices. I focus on how to integrate IoT devices into active problem solving for local challenges in the East African market.

Women who Mentor and Innovate in Africa, Nairobi, Kenya - Co-founder and Mentor
JULY 2013 - DECEMBER 2015
Formulated a program for women pursuing STEM courses in the university. The program included organizing sessions with professional women in the field of STEM, training in both technical and soft skills that relevant for career development and growth. I provided technical mentorship for Engineering students and aided/assisted in formulation of different clubs in the universities

Tech Avenue - Co-founder and Technical Mentor
JULY 2013 - DECEMBER 2014
This was a platform for students to develop and sharpen their skills that will aid them to innovate and develop products and services that are required by industry and have a direct impact in improving lives in the community at large.

AWARDS

Grace Hopper Conference Scholarship - *USC*
Jun 2019

OSDI '18 Diversity Grant - *USENIX OSDI Conference*
Sep 2018

Annenberg Fellowship - *University of Southern California*
2018-2019

IBM Manager Choice Award - *IBM*
2016 AND 2015

The 100: Tech Community Appreciation Awards - *Kenya Tech Community*
MARCH 2015
Best IoT Devices- and Mobile-related Application for Services Professionals - *IBM*
DECEMBER 2014
Ultra Affordable Educational Robot Challenge - *IEEE Robotics Society*
MARCH 2014
International Space Apps Challenge - *NASA*

2013

SKILLS

Programming Languages: Python, Javascript, HTML, Android, C++
Hardware: Arduino, Raspberry Pi, ATMEGA, ARM boards
Systems Engineering: Requirements Engineering, Architecture design
Data: NoSQL, SQL, Modeling
Product Design and Development: Sprint and Agile Methodologies
Data, Machine Learning Tools: Pandas, Pytorch, Tensorflow
Creative Coding: Spark AR, paper.js, p5js, Matter js, Three js, Unity

REFERENCES

To be provided upon request.