Edward Kwao

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EDUCATION

Hanbat National University(HBNU) **September 2021 – Present**
MSc.Intelligent Media Engineering - ***CGPA - 4.50/4.50(current)*** *Yuseong-gu, South Korea*

Kwame Nkrumah University of Science and Technology(KNUST) **August 2016 – August 2020**
BSc.Telecommunication Engineering - ***CWA - 74.48%*** *Kumasi, Ghana*

RELEVANT COURSEWORK

- Probability Theory
- Information Theory
- Writing English Technical paper
- Convex Optimization
- Signal Processing for Vehicular Communication
- Fundamentals of Wireless Communication

SKILLS/EXPERTISE

Tools/Programming Language: Matlab, Python, C, HFSS, LaTeX/Overleaf, Microsoft(Word, Excel, PPT), Linux scripting, SDR(Ettus USRP) programming, wireshark, SRS Airscope.

Academic/Industrial: Machine learning, Analysis, Research, Simulations, Wireless Channel Coding, wireless communication networks, and protocols

Libraries/Framework: Sci-kit Learn, TensorFlow, Keras, SciPy, Pandas, NumPy, Matplotlib, Seaborn

Interpersonal: Leadership, Teaching, Teamwork, Active listening, Responsibility, Critical Thinking, Excellent written and communication skills in English Language.

RESEARCH AND TEACHING EXPERIENCE

Intelligent Communications and Information Security Lab **September 2021 – Present**
Graduate Student, Research Assistant *Yuseong-gu, South Korea*

- Review research papers and research in LTE cellular networks and communication systems.
- Studying application of deep learning concepts in wireless communication.
- Reproduced results in highly ranked research papers relevant to our work, *using matlab or python.*
- Assisting undergraduate students with programming in MATLAB and Python.

Huawei Certified ICT Training Academy, KNUST **June 2021 – August 2021**
Tutor *Kumasi, Ghana*

- Guided enrolled students in grasping key computer networking concepts: Internet Switching, Routing Architecture, Network Security, Internet Protocols – IPV4, IPV6, DHCP, FTP, Telnet.

Faculty of Electrical and Computer Engineering, KNUST **September 2020 – August 2021**
Teaching and Research Assistant *Kumasi, Ghana*

- Designed and simulated printed/planar communication antennas.
- Reviewed papers and conducted literature reviews.
- Taught students Applied Electricity, Mobile and Satellite Communication, Digital Signal Processing, and Electromagnetism.
- Mentored final year undergraduate students in antenna design projects.

1 Signal Regiment, Ghana Military Headquarters **July 2019 – September 2019**
Intern *Kumasi, Ghana*

- Troubleshot networks and configured VOIP phones on duty days(once a week).
- Information Technology tutor for Other Rank Soldiers: Gave lessons for an hour, twice a week.
- Taught Other Rank soldiers cellular network protocols and data communication networks
- Drone Inspection and Maintenance team member: Assigned to inspecting and maintaining two drones twice a week.

New Jerusalem International School **July 2015 – July 2016**
Tutor *Accra, Ghana*

- Taught Junior High School Students integrated science and mathematics on the average of 18 hours/week.
- Students' Welfare committee assistant head: Engaged students in talks,twice every month with regards to hygiene and cleanliness.
- Initiated a weekly science and mathematics quiz competition among students and spearheaded the activity to promote the study of the subject matter.

PROJECTS

Vulnerability Analysis in Practical 4G LTE and 5G Networks — **Currently in Progress**

HBNU, South Korea

- We analyze the 3GPP radio access network protocol specifications.
- We explore vulnerabilities in how the protocols ensure synchronization between the network and user equipment.
- At the heart of our project, is the Timing Advance Command sent by eNodeB to the user equipment during random access procedure and its involvement in switching the user equipment between RRC Connected and RRC Idle modes.

Deep learning based Attack in Multiuser Communication Systems — **Currently in Progress**

HNBU, South Korea

- A deep learning based multiuser autoencoder is first trained in a way that produces similar bit error rate of users' signals.
- We assume that one of the users has malicious intention and transmits an adversarial perturbation that destroys the signals of normal users while rendering its own signal immune to the effect of the perturbation.
- We seek to formulate the generation of the adversarial perturbation as an optimization problem.

Heat Regulation System for Poultry Brooding House — **April 2021**

KNUST, Ghana

- The setup consists of LM35 sensors that measure and transmit the temperature
- of the brooding house to the end-user through an arduino microcontroller,
- zigbee and GSM modules when a temperature limit is exceeded
- The end-user is able to control the temperature of the primary source of heat in the brooding house.ie. the incandescent bulb and lantern via a mobile app.

High Gain Printed LPDA Design for UHF Applications — **September 2019 – May 2020**

KNUST, Ghana

- The log-periodic dipole antenna was designed and simulated with the HFSS software.
- It has a high gain and good far field communication parameters.
- It operates from 440 MHz–690 MHz, thus for radio and TV broadcasting.

CERTIFICATIONS AND AWARDS

- Deep Learning Specialization: Coursera (taught by Prof. Andrew Ng). — **February 2022 - March 2022**
- Huawei Certified ICT Associate (HCIA) - Routing & Switching. — **July 2019 - July 2023**
- First Class Honors - Telecommunication Engineering (KNUST). — **August 2020**
- Ghana Engineering Students' Association(GESA) Intellectual Competition Winner - KNUST. — **November 2017**
- Ghana National Petroleum Corporation (GNPC) Scholarship Award. Tuition, accommodation, living expenses, learning materials and health screening - Undergraduate. — **September 2017 - September 2020**
- Best Science and Math Tutor - New Jerusalem International School. — **December 2016**

EXTRACURRICULAR

- Member, Papa's Keep Fit Gym. — **2018, 2019, 2020**
- Captain, Wrontek Football Team. — **June 2019 - August 2019**
- Member, Ghana Engineering Students' Association Project Committee, KNUST. — **November 2017 - 2018**

REFERENCES

** Available on request