PATRICK BOATENG

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EDUCATION

Bachelor's degree **Sep 2017 - Nov 2021**

Kwame Nkrumah University of Science and Technology

- **Programme**: Bachelor of Science in Civil Engineering
- **Honor**: First Class [3.76/4.0] - *WES iGPA Calculator*
- **Thesis**: Predicting the compressive strength of concrete using machine learning techniques.
- **Key Courses**: Introduction to Finite Element Methods | Algebra | Numerical Analysis | Statistics and Probability | Differential Equation | Soil and Rock mechanics | Computer Aided Design (AutoCad) | Computer Programming (MATLAB) | Construction Management

RESEARCH INTEREST

- **Machine learning for structural health monitoring**: Explore the application of machine learning algorithms to monitor the health and predict the maintenance needs of civil structures such as bridges, buildings, and dams using predictive models that use sensor data to detect anomalies and structural weakness.
- **Finite Element Analysis of Structures:** I am passionate about applying advanced numerical techniques to analyze and optimize structural designs. My focus is on ensuring the safety and efficiency of engineering structures, such as buildings and bridges.
- **Risk Analysis of Structures:** I want to specialize in evaluating and mitigating potential risks associated with structural engineering projects. My research will aim at developing methodologies for identifying vulnerabilities and enhancing the resilience of critical infrastructure.
- **Seismic Retrofitting:** Earthquake resilience is a critical concern in regions prone to seismic activity. I am interested in developing retrofitting strategies to strengthen existing structures and minimize damage during seismic events.
- **Structural Steel Design:** Steel is a versatile material in construction. My research in this area focuses on innovative steel design approaches, including sustainability, cost-effectiveness, and structural performance.
- **Machine Learning and Artificial Intelligence for Design Optimization:** I am dedicated to exploring the integration of cutting-edge machine learning and artificial intelligence techniques into the field of civil engineering. My research will focus on using data-driven approaches

to optimize the design and construction of structures, improving efficiency and reducing resource consumption.

WORK EXPERIENCE

Assistant Consulting Engineer **Sep 2022 - Present**

Heureka Consult Limited **Full Time**

- Performed quality assurance and quality control procedures for construction projects, including overseeing the Cardinal Namdini gold mine's water storage and tailings dams.
- Generated project and laboratory reports for the client.
- Conducted geotechnical site investigations for road projects, such as the Accra-Ofankor road rehabilitation.
- Analyzed laboratory test results and made engineering judgements.
- Conducted an assessment of structural soundness and stability of pre-existing structures.
- Developed a Microsoft Excel add-in capable of soil classification, accommodating both the **Unified Soil Classification System** and the **American Association of State Highway and Transportation Officials** classification systems.

IT Consultant **Sep 2021 - Aug 2022**

Kwame Nkrumah University of Science and Technology **National Service Personnel**

- Provided assistance in the digitization of manual tasks. For example, I developed a simple database using Python and WxPython to keep track of customers whose applications have been processed.
- Assisted and consulted in all IT related work.

Site Engineer **Apr 2020 - Nov 2020**

Quatran Services Limited **Intern**

- Conducted site supervision and implemented Quality Assurance and Quality Control measures during the construction of the solvent extraction plant for Wilmar Africa.
- Ensured precise execution of structural drawings by interpreting and comprehending the drawings accurately.
- Prepared weekly progress reports summarizing all the works completed on-site.

HONORS AND AWARDS

- **Provost Excellent Students Awards, College of Engineering (KNUST) in year 3 and 4**: An award given to students who have demonstrated exceptional academic performance.

RESEARCH EXPERIENCE

Concrete compressive strength prediction **Mar 2021 - Aug 2021**

- Employed various machine learning techniques to develop models for predicting the 28th day compressive strength of concrete. **GitHub repo**

TECHNICAL SKILLS

- **Programming Languages**: Python | C | C++ | Microsoft Excel VBA
- **Deep Learning Frameworks**: Pytorch
- **Machine Learning**: Scikit-learn | XGBoost
- **Data Analysis**: Pandas | Numpy
- **Software**: Microsoft Office Excel | Latex | AutoCad | ETABS

PERSONAL PROJECTS

- **geolab**: An open-source software for geotechnical engineering analysis and modelling. **GitHub repo**
- **makepackage**: A Python package for packaging python code. (*Contributor/Collaborator*) **GitHub repo**

REFERENCES

[Available upon request]