EKPO PROMISE OSAINE

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EDUCATION

- **Cornell University, PhD. in Computer Science (In View)** August 2023- May 2028
- **Princeton University, MSc. in Computer Science** August 2021- May 2023
- **University of Benin, Benin City (UNIBEN), Edo State**, **Nigeria** Sept. 2015- March 2020
  B.Eng. in Computer Engineering (**First Class Honors - 4.77/5.00**)

Research Projects Undertaken:

- **Graduate Research Assistant, Independent Research** September 2023- Present
  Principal Investigator- Prof. Angelique Taylor, Prof. Sanjiban Choudhury
  Air Laboratory and PORTAL, Dept. of Computer Science**, Cornell University,** USA
  Main Project (Safe Multi-agent Reinforcement Learning for Dynamic Task Allocation**):** This project is aimed at modelling team dynamics in a medical setting. While several works have investigated human-robot interactions in safety-critical environments, there is a gap in ensuring safety during collaboration where implicit safety constraints exist.
  - Building a simulator that captures team dynamics in a medical environment.
  - Developing an RL algorithm that optimizes for task completion while satisfying safety constraints.
- **AI Safety and verification intern** June 2023- August 2023
  Robust Intelligence team, Siemens. Principal Investigator: Christof Budnick, **Manager**: Georgi Markov
  Main Project (Explainable AI (XAI) with Deep learning and Knowledge Graphs): This project was focused on providing explanation to the recommendations of graph-based machine learning models for medical diagnosis. It featured running GNNExplainer on predictions from graph attention networks to come up with detailed explanations after disease inference.
  - Wrote algorithms for two XAI experiments on real-world datasets & random datasets for proof of concept.

  Second Project (Titanium**):** This project was focused on building a multimodal safety monitor by combining two unsafe systems; a vision-based AI system and real-time localization system (RTLS).
  - Wrote python algorithms to facilitate the integration of the vision system and the RTLS system to facilitate exchange of information in compatible input and output format.
- **Graduate Research Assistant, Independent Research** August 2022- August 2023
  Principal Investigator- Prof. Jaime Fernández Fisac
  Safe Robotics Laboratory, Dept. of Electrical and Computer Engineering**, Princeton University,** USA
  Main Project (AI Safety- Investigating Persuasiveness in Large Language Models**):** This project is aimed at investigating emergent manipulative behaviors in large languages agents (ChatGPT, GPT-2/3/4/J), when combined with sequential decision-making systems due to the danger of AI technologies in producing compelling arguments for false ideas.
  - Conducted experiments to reveal that language models exhibit social biases embedded in their datasets in subtle ways.
  - Built a belief shift reward function on a persuasive metric to evaluate persuasiveness of arguments from large language models for false statement as an extension of Google BIG BENCH convince me benchmark task.

  Labs: As part of Safety-Critical robotic systems course (ECE 539):
  - Robust literature review on Barrier Functions, human trajectory prediction, constrained safety critics & motion planning.
  - Completed hands-on labs in Safe & Inverse Reinforcement Learning, Search and optimization (Graph and Sample-based
- **Graduate Research Assistant, Independent Research** August 2021- August 2022
  Principal Investigator- Prof. Barbara Engelhardt
  Beehive Research Laboratory, Dept. of Computer Science**, Princeton University,** USA
  Main Project (Multi Group Reinforcement learning for Effective Electrolyte repletion): This method involved using multi-group Gaussian process regression models in a fitted Q-iteration (FQI) reinforcement learning (RL) framework for personalization by deriving optimal policies for different subgroups of patients according to their comorbidities.
  - Developed a novel algorithm built on the intersection of reinforcement learning and gaussian processes for repletion.
- Supervised vs Unsupervised Intrusion Detection, 2021- Implemented machine learning algorithms for supervised and unsupervised intrusion detection, then compared both to discover strengths and determine optimal situations for each method.

Service, Presentations And Conferences Attended:

- NeurIPS Conference and WiML 2021 Workshop Volunteer and Black in AI Presentation on Multi Group Reinforcement learning for Maternal Health in childbirth.
- International Collegiate Programming Contest, ICPC, New York Competition,2022.
- NeurIPS WiML 2022 Conference Presentation, Multi Group Reinforcement learning for Effective Electrolyte repletion.
- LEAP Alliance NSF-Funded, Education USA and Michael Taiwo Scholarship Interviewer and Mentor, 2021 and 2022.

- Presenter, 2023 Princeton Research Day on Investigating persuasiveness in Large Language models.
- Reviewer and Attendee, 5th Annual Learning for Dynamics & Control Conference(L4DC), 2023.
- Black in Robotics Summer Workshop Facilitator in Robot Arm, 2023.
- XAI and Titanium Final Internship Presentation, 2023

TEACHING AND ACADEMIC EXPERIENCE

- **Tutor, Department of Computer Science, Cornell University, Ithaca, USA** Sep. 2022– May 2023
  Teaching Assistant for COS 4780/5780 "Introduction to Machine Learning (Python programming)"
- **Tutor, Department of Compute Science, Princeton University, Princeton, USA** Sep. 2022– May 2023
  Teaching Assistant/Preceptor for COS 126 "Computer Science: An Interdisciplinary Approach (Java Programming)".
- **Summer Researcher, Beehive Research Team, Dept. of Computer Science, Princeton.** June – Aug. 2022
  Conducted research experiments to gather results on "Multi Group Reinforcement learning for Effective Electrolyte repletion|".
- **Tutor, Department of Computer Engineering, University of Benin, Benin City, Nigeria** Sep. - Nov. 2019

INDUSTRIAL EXPERIENCE

- **AI Safety and verification intern, Siemens** **June 2023- August 2023**
- **Data Scientist& Search Engine Optimization Analyst (SEO), Data Science Nigeria** **March 2021- July 2021**
  Main Project (Learn at Home Education Technology Project, learnathome.radio):
  - Chatbot development, On page & Off page SEO, Technical SEO, Local SEO, Image SEO & Event SEO.
- **Data Engineer, Infinion Technologies (Microsoft Gold Partner)** **July 2020- March 2021**
  Training: ETL processing with SSIS (SQL Server Integration Services), **Main Project (**Union Bank Datawarehouse Project**)**
  - Database migration from multiple servers to Azure Datawarehouse & designing system standards, and programming.
- **IT Support (Intern), IT Unit,** Shell Nigerian Exploration and Production Company (SNEPCo) **July 2018 -Nov 2018**
  Major Areas of Training and Responsibilities: Python Programming for Data Science.
  - Sentiment Analysis for Shell Eco-Marathon Monitoring and Report with External Relations team.
  - IWAN break out project (Cabling and Configuration assistance) and Support for IT Agile Workshop training.
- **Information Engineering (Intern), IT Unit, SNEPCo** **Sep.2017 – Nov 2017**
  Major Areas of Training: SQL Programming, Flare Sirus Application.
  Key Achievements: Published documents and conducted training for staffs & interns on E&P catalog.
  Participation in the monthly back up of SNEPCo data in September-October 2018.

AWARDS / HONOURS

- Cornell Computer Science Fully Funded Ph.D. Admission 2023
- University of Michigan Robotics Ph.D Graduate Scholarship (Declined) 2023
- Princeton Data Driven Social Science Fellowship 2023
- Google CS Research Mentorship Class Cycle, WiML Travel Grant, and Black in AI Travel Grant 2022
- Gordon Wu Fellowship, Princeton University 2021
- University of Notre Dame & Saint Louis University Graduate Scholarship (Declined). 2021
- EducationUSA Scholarship, Opportunity Funds Program, US Embassy, Lagos, Nigeria 2020
- Michael Taiwo Scholarship Recipient, Nigeria. 2020
- Dean's Honor Award, Best Graduating Student, Department of Computer Engineering, University of Benin 2020
- Huawei and Glo Students Award for Academic Excellence, Nigeria 2019
- Total and Shell Nigerian Undergraduate Scholarship for Academic Excellence, Nigeria 2017

LEADERSHIP RESPONSIBILITIES / EXPERIENCES

- **Secretary General:** Association of Computer Engineering Students (ACES), University of Benin 2018
- **Organization Member,** Princeton Women in Stem Leadership Council, Princeton University 2021

PROFESSIONAL MEMBERSHIP / AFFILIATIONS

- Safe Robotics Lab, Beehive Research Team, Princeton University.
- Women in Machine learning, Princeton Society of Women Engineers, Data Science Nigeria.
- Black in **AI,** Black in Robotics., National society of Black Engineers, **NSBE,** IEEE Central Jersey Member.

IT SKILLS & TRAINING:

- Programming Languages: Python, Java, Development of Android applications, Use of Clusters for research computing. .
- Frameworks / Applications: PyTorch, TensorFlow, Scikit-learn, NumPy, Pandas, Stable baselines, OpenAI, Hugging Face