Samuel Folorunsho

Curriculum Vitae

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Education

Jan 2021 – May 2023 **University of Illinois at Urbana-Champaign**, *M.S.*, *Agricultural & Biological Engineering*.
Specialization: Dynamics, Control and Computer vision systems
Current GPA: 3.87/4.0

Oct 2012 – Sep 2017 **University of Ilorin, Ilorin, Nigeria**, *Bachelor of Science*, *Agricultural & Biosystems Engineering*.
Specialization: Power and Machinery Engineering
Degree GPA: 4.54/5.0 *Graduated departmental summa cum laude*

Experience

Research Experience

Jan 2021 – present **Graduate Researcher**, *University of Illinois*, Urbana, *Illinois*.
Allen Research Group
Advisor: Dr Cody Allen
– **Look ahead controller for a self-propelled agricultural boom sprayer** with trajectory planning and obstacle avoidance
– **Real time vision-based control** of a self-propelled tractor for tillage applications

Oct 2016 – Jun 2017 **Undergraduate Researcher**, *University of Ilorin*, Ilorin, *Nigeria*.
Power , Machinery and Control Lab
Advisor: Dr. Joshua Olaoye
– **Developed** an automatic poultry house lighting control system

Jul 2016 – Sept 2016 **Undergraduate Researcher**, *University of Ilorin*, Ilorin, *Nigeria*.
University of Ilorin Renewable Energy Lab
Advisor: Dr. Clement Akoshile
– **Investigated** the enabling features of low-temperature combustion with biodiesel in improving emission and efficiency

Industry Experience

Jun 2022 – Aug 2022 **Robotics and Automation Intern**, Corteva Inc., University of Illinois Research Park, Urbana, Illinois.
– **Supported the development of updated software** for an under-canopy robot which reduced the robot crash rate below 2 in 1000 ft
– **Utilized RGB images from under canopy robot to develop vision based models** which improved crop phenotyping and breeding
– **Developed a DeepSORT model** for easier crop trait identification, tracking and counting

Jan 2018 – Dec 2020 **Associate**, Solina centre for International Development and Research, Abuja, Nigeria.
Northern Nigeria Routine Immunization Strengthening Program
– **Coordinated the costing, procurement and Installation of 40 solar direct drive refrigerators** and 3 walk-in cold rooms which improved cold chain equipment saturation in Yobe state from 72% to 90%
– **Managed the biweekly distribution of potent vaccines**(worth thousands of dollars) and reduced vaccine stock out from 21% to 2% within one year at 375 service delivery points in Yobe State, Nigeria
– **Served as lead assessor** in the GAVI/Federal Government of Nigeria funded Cold chain equipment optimization plan assessment across 119 facilities in Yobe State
– **Developed excel-based dashboards and models** for company wide streamlining of routine analysis and report, thereby enhancing work output and timeliness
– **Coordinated data gathering process from all data sources** and was responsible for timely preparation of weekly, monthly, quarterly, and annual reports sent to the program funders and other stakeholders.

Jul 2015 – Jan. 2016 **Intern**, National Center for Agricultural Mechanization, Ilorin, Nigeria.
– **Participated in the design, fabrication, and installation** of agro-allied and fast-food machines
– **Involved in the design and development of control system of a "tricketor"** -3 wheeled mini farm tractor- for the integrated farm

Teaching Experience

Aug 2022 – Dec 2022 **Teaching Assistant**, ABE 466: Off-road vehicles Engineering, University of Illinois, Urbana.
Organized office hours, conducted lab sessions and graded lab reports and homeworks

Oct 2014 – Jun 2017 **Undergraduate-level Engineering course tutor**, Unviersity of Ilorin, Ilorin, Nigeria.
Taught classes including algebra,calculus, mechanics, controls, dynamics, hydraulics, thermodynamics, and heat transfer

Leadership , Volunteer and Outreach Experience

Jun 2021 – present **Sound technician**, Twin City Bible Church, Urbana, Illinois.
Setup, maintain, operate and mix sound systems for church activities

Feb 2019 – present **Volunteer**, SolarAid, London, United Kingdom.
Eradicating poverty and climate change in Africa, through innovations and awareness creation.

Apr 2018 – present **Member**, Young African Leaders Initiative, Washington DC, United States.
Raising awareness and spurring action on energy and environmental challenges in Africa

Oct 2016 – Aug 2017 **President**, DareWord Student Association, University of Ilorin, Nigeria.
Pioneered a mentoring program that helped 45 freshmen adjust to college in its first year. The program has been self sustaining

Oct 2016 – Aug 2017 **Mentor**, DareWord Peer Mentoring, University of Ilorin, Ilorin, Nigeria.
Provided both academic and non-academic guidance to new students helping them adapt to new life in the University

Oct 2016 – Nov 2016 **Team lead**, Engineering Community Based Experience Scheme, Ilorin, Nigeria.
Led 40 seniors on a community development project. We repaired water systems, roads and gave career talks at the high school

Honors

[2021] Awardee, Nigerian Petroleum Technology Development Fund(PTDF) Overseas scholarship

[2017] Best Graduating Student, Department of Agricultural and Biosystems Engineering , University of Ilorin

[2013 – 2017] University Scholar, University of Ilorin Senate

[2017] Most innovative senior , Department of Agricultural and Biosystems Engineering, University of Ilorin

[2016] Recipient, Rev. Tony Akinyemi Foundation Scholarship (rTSF)

[2015] Faculty of Engineering Scholar, Faculty of Engineering and Technology, University of Ilorin

Projects

[2022] Co-developed a vision and LIDAR based navigation and control software for an under-canopy robot
– Updated software improved the performance of the robot with crash rate reduced below 2 in 1000ft

[2021] Co-developed a dynamic model of an autonomous tractor-cart system controlled using MRAC and L1 adaptive controllers
– Analysis of the system shows that L1 adaptive control is superior to MRAC as L1 decouples the adaptation loop from the control loop, enabling arbitrarily fast adaptation without sacrificing robustness

[2017] Developed an automatic Poultry House Lighting Control System utilizing Proteus and C
– A time & event-based system that controls the lighting in a poultry house based on the age and lighting requirement resulting in 20% reduction in energy consumption and improved productivity

[2017] Investigating the enabling features of low-temperature combustion with biodiesel in improving emission and efficiency
– Experiment revealed that biodiesel improved combustion phasing substantially relative to petroleum diesel, causing the indicated fuel conversion efficiency of biodiesel to be 6% higher

[2015] Supported the development of biogas digester and production of methane gas
– The digester produced 2200 Litres of biogas (55.3% CH4, 43.9% CO2, and 0.8% H2)

Skills and Software Experience

General PYTHON ,MATLAB,SIMULINK,C++,AUTOCAD,SOLIDWORKS, ROS,TORCH,PLC , PROTEUS, R

Others ARDUINO, LATEX, MS SUITE, YALMIP,SPSS,LABVIEW, ARCGIS, RASPBERRY PI, PHOTOSHOP

Languages FLUENT ENGLISH, NATIVE YORUBA, CONVERSATIONAL SIGN LANGUAGE

Professional Activities

Member Nigerian Society of Engineers

Graduate member SAE International

Attendee AgTech Summit, IL. 2022

Attendee Controls symposium: Control challenges in soft Robotics, IL. 2021

Attendee AgTech Summit, IL. 2021

Attendee Electrical safety symposium, IL. 2021

Attendee Illinois Autonomous Farm workshop, IL. 2021

Relevant Experience/Coursework

- PID, MRAC, L1, LQR & Model Predictive Control
- Autonomous Vehicle Systems & ROS
- Off-Road Vehicle Design & 3D Printing
- Bio-inspired robots and biological systems
- Stereo and multi-spectral camera and sensors
- Deep learning and computer vision
- Nonlinear/Linear Control Theory and Design
- Powertrains and I.C Engine Modeling
- Image processing
- Tractor testing