

Timoh William Chick

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1 Research Vision

PhD Objective: Dynamic Mechanical/Mechatronics Engineer with interdisciplinary background in industrial, automation, and marine engineering, driven by robotics and advanced manufacturing. Demonstrated expertise in designing scalable autonomous robotics, precision manufacturing, and agriculture systems.

2 Education

MSc Mechatronics Engineering Expected 2026

Faculty of Engineering and Technology, University of Buea

- Research Topics: Ethical AI Frameworks for Privacy-Preserving Data Fusion in Multistage Additive Manufacturing; Digital Twin Framework for AI-Optimized Cocoa Harvesting (ROS2 simulation, field validation, sub-centimeter accuracy); Spider-Inspired Robotic Net Weaving for Terrestrial, Marine, and Space Applications

Higher Diploma Marine Engineering (Hons) 2014–2016

Regional Maritime University Ghana

GPA 3.68/4.0 — Best Student Award

MEng Industrial & Production Engineering 2009–2012

ENSAI, University of Ngaoundere

GPA 3.38/4.0 (Scholarship Award)

Associate Degree in Mechanical Engineering & Industrial Automation 2006–2008

IUT Douala

GPA 3.0/4.0

Advanced Level – Maintenance of Electro-Mechanical Equipment 2003–2006

GTHS Bamenda

General Certificate of Education (5 papers)

3 Certifications (Awarded)

- **2022:** Research/Practical Training Proficiency (Kuramaguru College of Technology India)
- **2020:** Certificate of Proficiency – GUNT Hamburg
- **2020:** Material Testing Proficiency (Zwick/Roell)
- **2020:** EMCO Training (CT260, FB450, Siemens 828D)
- **2016:** Cadet-ship Training + Fire-Fighting & Survival at Sea (RMU)

4 Professional Experience

Head of Mechanical-Mechatronics Engineering Laboratory 2019–Present

PKFokam University Institute of Excellence, Cameroon

- Secured, installed, and commissioned \$250k CNC EMCO/FB laboratory equipment; trained 200+ students; managed \$2.5M equipment budgets
- Supervised 12 capstone projects in robotics, additive manufacturing, and sustainable engineering
- Taught 200+ students: CNC, Robotics, 3D Printing, Manufacturing Automation, Engineering Materials, Metrology

Project Engineer (BIM & Simulation) 2017–2019

Wally Construction, Cameroon

- Project leadership from procurement to operation, maintenance, and contractor/subcontractor evaluations
- Reduced design-to-fabrication time by 18% via SolidWorks-BIM workflows; led 5 multidisciplinary teams (30 people)
- Managed project budgets, schedules, and SHEQ compliance (Safety, Health, Environment, Quality)

CAD/CFD Engineer (Freelance) 2016–2017

DESSIMINTEL Ghana

- Design and Simulation of Six-Z equipment for small-scale wire production (KERSL Ghana 2017)
- Design and development of Seaweld offshore equipment (STANDCODE Ghana)
- Designed auto-gutter evacuator with 20% efficiency improvement (showcased at DAAD Falling Walls Lab)

Performance Engineer 2011–2012

Cameroon Railway (CAMRAIL)

- Optimized CC 2200 locomotives via flash-memory systems and predictive maintenance protocols

5 Research Projects & Preprints

Modeling Intelligent Robotic Systems for Autonomous Infrastructure Inspection In Progress *Target: IEEE RA-L, Jan 2026* — github.com/phaWill/inspection-bot

- Built ROS2 simulation with Gazebo achieving 96% detection accuracy (simulated cracks); physical prototype tested on 3m beam segment

AI-Driven Autonomous Machining Sequence Optimization for Smart Manufacturing In Progress *Target: CASE 2026, Feb 2026* — github.com/phaWill/machining-rl

- DQN reduced simulated cycle time 18% on 500 toolpaths; physical test: 10 parts on EMCO CT260, Nov 2025

Adaptive 6-DOF Robotic Arm with Real-Time Payload Compensation 2024–2025

- Designed forward/inverse kinematics algorithms in MATLAB/Simulink for precision motion control
- Developed and tuned adaptive PID controllers on Arduino Mega for dynamic payload handling

- Integrated IMU and torque sensors for real-time stability adjustments (15% improvement in positional accuracy under variable loads)
- Implemented Python user interface for trajectory planning and system monitoring

IoT-Enabled Predictive Battery Health Monitoring System 2024 — Personal Innovation Project

- Built end-to-end IoT monitoring system using ESP32 microcontrollers and Python-based data pipeline
- Implemented MQTT protocol for real-time telemetry streaming to cloud dashboard
- Developed TensorFlow ML models for State-of-Charge (SoC) and State-of-Health (SoH) prediction (reduced unplanned downtimes ~20%)
- Visualized trends using Matplotlib and Grafana for predictive maintenance strategies

Smart Factory Conveyor Automation Simulation 2024 — Academic/Teaching Demonstration

- Modeled modular conveyor system in Simulink with integrated Siemens PLC logic
- Simulated object detection using IR and ultrasonic sensors with automated sorting based on weight and size
- Used as interactive training tool for industrial automation demonstrating sensor integration, ladder logic, and HMI design

Autonomous Mobile Robot Navigation Prototype 2023–2024 — Robotics Research Initiative

- Developed ROS-based navigation stack for differential-drive mobile robot incorporating mechanical dynamics
- Implemented SLAM (Simultaneous Localization and Mapping) using LiDAR and odometry data
- Integrated obstacle avoidance and path planning using A* algorithm for autonomous indoor navigation

6 Technical Competences

Mechatronics & Control Systems

- AI-driven autonomous robot design, feedback control, sensor fusion
- PLC Programming (Siemens, Ladder Logic, Allen Bradley), PID Tuning
- Industrial Automation, HMI/SCADA Integration, Motor Control & Drives
- Real-time Control Systems, System Identification & Modeling

Robotics & Autonomous Systems

- ROS/ROS2, Docker, Isaac Lab, MuJoCo, Gazebo
- Robotic Kinematics & Dynamics, Motion Planning, 6-DOF Manipulator Design
- Sensor Fusion (IMU, Vision, LiDAR), Actuation Systems, End-Effector Integration
- Collaborative Robotics Concepts, Payload Analysis

AI/ML & Computation

- TensorFlow, PyTorch, OpenCV, Reinforcement Learning (DQN)
- Python (Data Analysis, Automation, ML), C/C++, Bash Scripting
- MATLAB/Simulink (Advanced Control Design, System Simulation), LabVIEW
- Edge Computing, Firmware Development

Embedded Systems & IoT

- Arduino, ESP32/ESP8266, FreeRTOS, Embedded C/C++
- IoT Protocols (MQTT, CoAP), Wireless Communication (BLE, WiFi, LoRa)
- Microcontroller Programming, PCB Design Basics, Protus

Manufacturing & Simulation

- Additive Manufacturing, EMCO CT260, Siemens 828D, Rapid Prototyping
- CAD/CAM: SolidWorks, Siemens NX, Autodesk Inventor, AutoCAD, Autodesk 360, 3ds Max
- FEA/CFD: ANSYS, COMSOL Multiphysics
- Hardware-in-the-Loop (HIL) Testing, Failure Mode Analysis

Industry 4.0 & Management

- Digital Twins, CMMS, Predictive Maintenance, Lean Six Sigma
- Project Management: Primavera P6, Microsoft Project
- System Validation & Verification, Troubleshooting & Debugging
- Sustainable Engineering, Solar-powered edge computing, Energy-efficient actuators

7 Leadership & Outreach

- **Founder, Sentinel Tech (NGO):** Trained 20 youths in AI-powered professional hands-on skills (Cameroon)
- **Founder, Computational Engineering Design Club (RMU):** 240 members (Ghana)
- **University Inclusion:** Principal Patron of student clubs in Cameroon and Ghana
- **Lead Engineering Hub:** Leading startup group in IT and AI enhancement
- **Community Preservation:** Lead committee for street cleaning initiatives (Douala)

8 Honours & Awards

- **2024:** Featured Speaker – 8th PKFokam Science & Technology Conference
- **2016:** Best Student – Marine Engineering, Regional Maritime University

9 References

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