NWAFOR Chibundo

Mechatronics Engineer

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Profile

PhD in Automation with expertise in the design and manufacturing of advanced robots for medical/industrial applications. Skills in robotics, control systems and innovative solutions dedicated to advanced technologies.

Competences

Programming Languages: C/C++, Python, MATLAB, Assembly, Ladder.

Software and Tools: Solidworks, Proteus, COMSOL, MS Office Suite, Simulink, LabVIEW.

Technical Skills: Control system design, mechatronics integration, micro-robot design, sensor fusion, finite element analysis (FEA), PCB design, PLC programming, Siemens Tia portal, I/O factory automation simulation.

Languages: English (fluent), French (intermediate), Igbo (native).

Awards

Best Presentation Award CRAS Conference, Paris, France, 2023.
TETFUND Scholarship by Nigeria Federal Government, 2017 - 2019.
First Class Graduate Scholarship Anambra State Government (ANSU), 2014.
Faculty of Engineering Best Graduating Student ANSU, 2012.

Academic Background

2020-2023 **Ph.D.** in Automation — UBFC
Université Bourgogne Franche-Comté, FEMTO-ST Institute, France.

2017-2019 **M.Sc.** in Automation/Robotics (Control for Green Mechatronics) UBFC
Université Bourgogne Franche-Comté, Besançon, France.

2008-2012 **B.Eng.** in Electrical & Electronic Engineering — ANSU
Anambra State University, Uli, Nigeria.

Professional Experience

Since 2024 **Research Engineer - FEMTO-ST** — France
- Conducted **optimization and performance analysis** of soft spherical joint for a hybrid robotic manipulator.
- Conceptualized and developed **novel compliant spherical joints**.
- Performed **analytical model and FEA simulations/investigation**.
- fabricated **monolithic manipulator** using CAD tools and cleanroom.
- Integrated control system and successfully validates its functionality.

2023-2024 **Postdoctoral Researcher - FEMTO-ST** — France
- Upgraded a 3-DOF glass-based parallel continuum robot to a **6-DOF configuration** with high precision and complex micro-manipulation.
- Developed **kinematic models** for decoupled orientation/translation.
- Conducted performance evaluation, workspace & stiffness analysis.
- Developed a **MATLAB simulation application** for demonstration.
- Directed the fabrication and its **validation inside the SEM**.

2020-2023 **Doctoral - UBFC** — France
- Designed and **conceptualized the smallest glass-based Concentric Tube Robot (CTR)**, with a tube radius of curvature down to 5mm.
- Conducted performance analysis of CTR such as stability evaluation.
- **Developed forward and inverse kinematics models** for glass CTR.
- Introduced a **novel precurving method for glass tubes** with detailed characterization documentation.
- Programmed the glass CTR control deployment and **model validation**.
- Conceptualized and **developed a Parallel Continuum Robot (PCR) using glass** backbone. After which, experimental model **validations**.
- Carried out performance analysis such as workspace and stiffness.
- Utilized CAD design, 3D printing, and Arduino-based control programming for both systems.

2019 **Validation and Test Engineer (Internship) - Aix-Marseille** — France
- Improved the design and validated the **indoor localization system**.
- Implemented **sensor fusion** (IMUs and vision sensors) and **robot real-time pose control** within **ROS network**.

2014-2015 **Site Supervisor and Maintenance Officer - Ringardas** — Nigeria
- Oversaw contractor activities, for the **installation and commissioning of facilities** in a six-story company headquarters building.
- Managed the maintenance operations for critical facilities.

2014 **Industrial Installation Engineer - VACC Technical Limited** — Nigeria
- Interpreted and **analyzed industrial electrical schematics** for large-scale buildings and infrastructure projects.
- Executed **installation and wiring** of industrial electrical systems

2012 **Electronic Programmer and Developer (Internship) - ELDI** — Nigeria
- Developed a **logic gate emulator platform** utilizing Atmel 8051 microcontroller and the circuit for the **embedded systems trainer**.
- Designed **energy-efficient PCBs in Proteus** for compact system.