CHIDIKE VINCENT

APPLIED RESEARCHER · EDGE AI, IOT AND PRIVACY-PRESERVING MACHINE LEARNING

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PROFILE

Applied researcher and software engineer with an MSc in Computing (Distinction) from Sheffield Hallam University. I build the whole system, from hardware and models to the interface people use. Lead author of the Best Paper at IoT 2025 in Vienna, first author of a paper presented at IEEE CIBCB 2026 in Athens, and first author of a paper accepted at IoT 2026 on an animal welfare monitoring system deployed at Heeley City Farm.

My research covers edge intelligence, privacy-preserving machine learning and IoT on low-cost hardware. I learned to code in 2023.

PUBLICATIONS AND RECOGNITION

Multi-Sensor IoT Platform for Farm Animal Welfare Monitoring: Rule-Based Edge Classification, Person Detection, Live Dashboard Visualisation and Exploratory Vision Model Evaluation. First author, with co-authors from Sheffield Hallam University and Heeley City Farm. 16th International Conference on the Internet of Things (IoT 2026), Newcastle. Accepted.

Privacy-Preserving ECG-HRV Emotion Classification for Mood Swing Detection using Federated Learning on Constrained Edge Devices. First author, with five co-authors. 2026 IEEE Conference on Computational Intelligence in Bioinformatics and Computational Biology (CIBCB), Athens. Accepted 1 June 2026, presented. shura.shu.ac.uk/37632. Journal extension in progress.

Real-Time Edge Intelligence in UAV for Search-and-Rescue: Onboard Energy-Efficient Video Summarisation with Reduced Data Transmission. Lead author. 15th International Conference on the Internet of Things (IoT 2025), Vienna. ACM, pp. 52 to 58. DOI 10.1145/3770501.3770508. Best Paper Award, from 72 submissions across 26 countries (42% acceptance).

- Best Paper Award, IoT 2025, Vienna · Campus Jobs Student Employee of the Year 2025 · Sheffield Hallam University Gold, Silver and Bronze recognition awards.

RESEARCH PROJECTS

Animal welfare monitoring with Heeley City Farm, first author

Mar 2026 to present

Technical research lead · SHU and Heeley City Farm partnership · IoT 2026, Newcastle (accepted)

- Sole developer of a five-enclosure system (goats, sheep, cattle, ponies, chickens): a Raspberry Pi 4B in each logs temperature, humidity, light, motion and sound every 30 seconds and classifies welfare against the Five Freedoms on the device. Monitoring since 1 July 2026, with 88,000+ polling cycles. Live public dashboard at heeleyfarmwelfare.org.uk.
- Designed with farm staff in a co-design workshop. YOLOv8n via ONNX Runtime detects people in 156 ms on the device and permanently deletes those frames before any path is recorded.
- The system flagged a heat stress concern in the poultry enclosure: at 29 °C and 43% humidity the temperature-humidity index is about 80 against an onset of 74.
- Fine-tuned EfficientNet-B0, Swin Transformer Tiny and ResNet-50 on 13,692 labelled overhead images. Best specialist MCC +0.732 (ponies), best generalist +0.540 (ResNet-50). Swin trailed ResNet-50 on three of five enclosures. Single runs, so indicative.
- Found that the one welfare signal that varied (normal behaviour) is not a single-frame visual property, which points to temporal models as the next step.

Privacy-preserving mood detection from ECG, first author

Mar to Jul 2026

IEEE CIBCB 2026, Athens (31 Aug to 2 Sep). Accepted 1 June 2026

- Built the full pipeline in Python, from raw ECG preprocessing and windowed HRV features to leave-one-participant-out evaluation across three public datasets (DREAMER, AMIGOS, EmoWear) and 74 participants.
- Class equalisation raised recall for the rare low-arousal, low-valence class on DREAMER from 7.8% to 56.3% (within-participant, 48.5 percentage points). Cross-participant accuracy stayed modest: binary valence between 50% and 57% across datasets.
- Federated learning (Flower, logistic regression) on a physical six-node Raspberry Pi 4 cluster came within 2.7 points of centralised training on all three datasets. A personal awareness tool, not clinically validated.

- Pilot on one participant with a Polar H10 strap, four video clips and no calibration: 75% binary valence accuracy. One person, so indicative only.

UAV edge intelligence for search and rescue, lead author *Jan to Aug 2025*

Real-Time Edge Intelligence in UAV for Search-and-Rescue. Best Paper Award, IoT 2025, Vienna

- Built the UAV from components and an onboard pipeline on a Raspberry Pi 4 (Python, YOLOv5n, OpenCV) that detects people and sends only essential frames.
- On a test video, 4,024 frames reduced to 19, data from 906 MB to 32 MB, and energy use down 77%, with human detection integrity above 85% (validated with DeepSort).
- Best Paper from 72 submissions, 145 authors, 26 countries, 42% acceptance. Published by ACM, DOI 10.1145/3770501.3770508.

APPLIED ENGINEERING

- Workplace Scientifics (Sep 2025 to present): sole engineer of a multi-tenant portal for a UK occupational hygiene company, with automatic extraction from PDF inspection reports. In user testing.
- Prompt Bnk (Jun 2025 to Mar 2026): live subscription platform for AI prompts. 19 of 20 test tasks completed, usability 84.5 out of 100, 50+ subscribers.
- Tables Stick (Apr to Jun 2026) and Simply Connect (May 2026 to present, early development): a school subscription platform and an iOS app on an existing social prescribing platform.

SPEAKING, TEACHING AND COMMUNITY

- Co-founder and Technical Research Lead, Teknoozu (2024 to present): three events with BCS South Yorkshire, Yorkshire DevOps and SHU, including a quantum computing workshop and Raspberry Pi hackathon I co-delivered. Mentored 80+ students.
- Judge, FutureTech Appathon and SmartPulse Hackathon, Sheffield Hallam University. Cover Supervisor and Teaching Assistant, SAAF Education (2024 to 2025). Computer Science Teacher, Handsworth Grange Community Sports College (2025). Course Representative and Student Ambassador, SHU.

EDUCATION

MSc Computing, Distinction *Sep 2023 to Nov 2025*

Sheffield Hallam University

BEng Electrical and Electronics Engineering, 2:1 (Computer Engineering major) *2010 to 2016*

Federal University of Technology, Owerri, Nigeria

SKILLS

Research: Edge computing, IoT systems, federated learning, computer vision, HRV feature extraction, literature review, peer-reviewed publication, conference presentation

Tools: Python, PyTorch, YOLO, OpenCV, ONNX Runtime, Flower, NeuroKit2, scikit-learn, pandas, NumPy, Raspberry Pi 4, Supabase

Engineering: C#, ASP.NET Core, TypeScript, React, PostgreSQL, Azure, Docker