KENIEL PEART

Machine Learning Researcher | Computer Vision & Radar Sensing

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SUMMARY

Machine learning researcher with experience in computer vision, 3D human modelling, radar simulation, foundation-model transfer, and sensor-based perception. Builds end-to-end AI systems from dataset collection and model design to evaluation and deployment on real sensing hardware. Strong PyTorch background across transformers, self-supervised vision models, SMPL-X, synthetic data generation, and radar sensing, with prior industry experience in production software engineering and cross-functional technical leadership.

PROFESSIONAL EXPERIENCE

PhD Researcher — Radar-based AI, Human Motion Modelling and Sensor Simulation *2022 | Present*

University of Southampton, UK

- Developed CADENCE, a temporally coherent 3D human mesh recovery framework for reconstructing whole-body motion from monocular video using PyTorch, LoRA/PEFT fine-tuning, mixed precision training, and model distillation
  Paper: "CADENCE: Temporally Coherent Whole-Body Human Mesh Recovery with Cross-scale Attention and Multi-rate Refinement" — Submitted to ECCV 2026
- Built MARS, a differentiable sensor-simulation pipeline that generates synthetic radar data from 3D human motion, supporting scalable training-data augmentation for AI-based human activity and gesture recognition
  Paper: "Mesh-Faithful Differentiable Radar Simulators: Zero-Shot Synthesis of Human Micro-Doppler" — Submitted to NeurIPS 2026
- Adapted vision foundation models (DINOv2, CLIP, MAE) for radar spectrogram recognition, studying cross-modal transfer to reduce the sensor-shift gap in non-visual sensing tasks
  Paper: "Frozen Vision Foundation Models Narrow the Sensor-Shift Gap in Non-Visual Spectrogram Recognition" — Under review at TMLR
- Designed multimodal data collection and evaluation pipelines integrating TI mmWave radar, Azure Kinect, OpenCV, MATLAB, Python, and signal-processing workflows for human motion analysis
  Paper: "Advancements in Non-Invasive Neuroimaging: Exploring the Potential of Radar Technology for Brain Imaging and Tumour Detection" — IEEE EMBC 2024 (Oral Talk, NextGen Scholar Award)
- Optimised ML workflows for efficient training and deployment, using CUDA, TensorRT, NVIDIA DALI, mixed precision, and model compression techniques
- Developed robotics and edge-AI prototypes using ROS, NVIDIA Jetson, Arduino, MQTT, Thymio robots, and Tello drones for heterogeneous swarm robotics and disaster-response applications

Masters Researcher *2021 | 2022*

University of Southampton, UK

- Built an end-to-end deep learning model combining 1D convolutions and multi-head self-attention for cancer subtype classification from high-dimensional gene expression data, achieving 92-94% accuracy across 33 cancer subtypes and outperforming existing deep learning and traditional machine learning baselines
- Designed an explainability pipeline using saliency maps and gene-effect scores to identify candidate biomarkers, validated against established cancer databases
- Reimplemented a self-supervised motion-transfer method for animating still images via latent-space transformations from driving video; reproduced training and benchmark evaluation pipeline

Technical Lead / Scrum Master / Lead Software Developer *2018 | 2021*

NCB Financial Group, Kingston, Jamaica

- Led delivery of Jamaica's first online mortgage portal and centralised lending platform, reducing application time from weeks to 3 days and digitising 80% of the lending process
- Architected microservices, testing, and analytics infrastructure; contributed to **$200M+ annual cost reduction** and drove Kubernetes enablement across engineering teams
- Presented architecture proposals and delivery updates to C-suite stakeholders

EDUCATION

PhD in Artificial Intelligence *2022 | Present*

University of Southampton, UK | MINDS CDT Studentship

MSc in Artificial Intelligence (Distinction) *2021 | 2022*

University of Southampton, UK

Thesis: *Universal Gene Transformer: Cancer Subtype Classification using RNA-Seq Data (supervisor: Dr Jo Grundy)*

BSc in Computer Science (Distinction) *2014 | 2017*

University of the West Indies, Mona, Jamaica

Thesis: *An Evolutionary Approach to Training Intelligent Agents using NEAT (supervisor: Dr Gunjan Mansingh)*

TECHNICAL SKILLS

AI & Deep Learning	PyTorch, TensorFlow, Hugging Face Transformers, DINOv2, CLIP, MAE, DeepSpeed, RAPIDS cuML, TensorRT
Training & Optimisation	LoRA, mixed precision, model distillation, multi-GPU / multi-node training, HPC, DALI
Architectures	Transformers, 1D CNNs, Mamba, Mixture of Experts, Diffusion, Flow Matching
LLM & Retrieval	RAG pipelines, embedding models, reranking, vector search, agentic workflows
Evaluation	Benchmark design, ablation studies, cross-domain evaluation, macro-F1, MCC, cross-validation, retrieval metrics
Programming	Python, C++, Java, JavaScript, TypeScript, MATLAB
3D & Simulation	SMPL-X, differentiable simulation / rendering, Ansys HFSS, Blender, Open3D, Trimesh, PyVista, OpenCV
Hardware & Sensors	FMCW radar, micro-Doppler, TI 77 GHz radar, Infineon radar, Azure Kinect / RGB-D, Jetson, Raspberry Pi, ROS
Infrastructure	Docker, Kubernetes, CI/CD, Git

SELECTED PROJECTS

Multimodal Research Agent & Evaluation Platform *Personal Project*

- Built an end-to-end RAG system for radar and computer vision literature across papers, tables, and figures; processed scientific PDFs with Nemotron Parse and evaluated retrieval quality, citation correctness, and task success

Additional projects: Applied neuroevolution (NEAT) to learn Tetris game policies by simultaneously evolving network topology and connection weights in Unity / C#; scene recognition with KNN, Bag of Visual Words, Dense SIFT / PHOW; dynamic maze solver with Q-Learning.

AWARDS / TALKS / TEACHING

- **IEEE EMBC NextGen Scholar Award** (2024); **Chevening Scholarship** (2021); **MINDS CDT Studentship** (2022)
- Oral presentations: IEEE EMBC 2024, MobiUK 2024, MINDS CDT Symposium
- Demonstration: AI DJ camera-based gesture recognition system, Southampton Science Festival
- Teaching Demonstrator: Intelligent Agents, Introduction to Computing, Software Project Management, University of Southampton (2022-Present)
- Dean's List (2016-2017), Letter of Commendation (2014-2016), UWIDEF and Flow Foundation Jamaica Merit-Based Scholarship — University of the West Indies

CERTIFICATIONS

- **Neural Networks and Deep Learning** — DeepLearning.AI
- **AI For Everyone** — Coursera / DeepLearning.AI
- **Advanced Certified Scrum Developer (A-CSD)** — Scrum Alliance
- **Certified ScrumMaster (CSM)** — Scrum Alliance
- **Agile Project Management (ICP-ACM)** — ICAgile / Cprime
- **Enterprise Design Thinking Practitioner** — IBM
- **Enterprise Design Thinking – Team Essentials for AI** — IBM