Maki Wardle

Applied AI Researcher and Immersive Systems Designer

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I build systems that empower people to use complex spatial information to reimagine the world around them. Currently, I'm a Research Intern at Nokia Bell Labs' AI Research Lab creating agents that build physically grounded city-scale 3D digital twins for 6G networks. In my PhD at University of York and MOLA, I'm designing AI-mediated collaborative play with archaeological data in London. Previously, I worked in real-time 3D R&D at the European Space Agency and Buro Happold.

Education

PhD Archaeology and Interactive Media, University of York and MOLA Archaeology

Title: Hacking the Big Smoke: Alternate Reality Games and London's Archaeology

London and York, UK, 2023-2027

Exploring large-scale collaborative interaction and AI-mediated playful meaning-making with archaeological data at one of London's busiest public transit hubs. Designing and evaluating a series of experimental prototypes spanning embodied, conversational and sonic play.

BSc (Hons) Immersive Systems Design with 3D Modelling, The Glasgow School of Art

Grade: First-Class | Glasgow, UK, 2018-2022

Experience

Nokia Bell Labs — PhD Intern in Agentic 3D Modelling for 6G Simulation and Training, AIR Lab

Cambridge, UK, May-Aug 2026

Creating an agentic pipeline that weaves together photogrammetry, LiDAR, street imagery, splats and GIS to build physically grounded, city-scale 3D digital twins for 6G ray-tracing simulation and neural physical-layer training.

European Space Agency — PhD Intern in Realtime 3D Rendering for Space Exploration

Harwell, UK, Jan-Jul 2025

Capturing regolith simulants and creating shading models to realistically render the Moon's surface in Unreal Engine, helping to close the sim-to-real gap in XR astronaut training and machine learning for future lunar missions. Presented as a poster at SIGGRAPH Asia 2025.

Buro Happold — Graduate Geospatial 3D Web Mapping and Game Developer

London, UK, 2022-2023

Developing techniques to instantly stream hundreds of kilometres of CAD, GIS, BIM and sensor data into a city-scale digital twin that dynamically evolves with the masterplan. Creating intuitive simulation and modelling tools that enable decision-makers to act on data as soon as it enters production and explore "what if?" scenarios on the fly. Supported by an Epic Games MegaGrant. Winner of the Society for Digital Engineering Best Project 2023.

Skills

3D Vision & Geometry: neural and implicit representations (Gaussian Splatting, SDFs) · 3D reconstruction from imagery · differentiable rendering · multi-modal perception and fusion · synthetic data generation · geospatial data integration (CAD, GIS, BIM) · mesh and procedural geometry generation (Blender Python)

Machine Learning & Agentic Systems: creating agentic workflows (MCP) · conversation design · model fine-tuning · structured generation and execution-grounded evaluation · PyTorch · HuggingFace (Transformers)

Real-Time Simulation & Rendering: Unreal Engine (C++) · Unity (C#) · physically based rendering · shader programming · design for spatial interaction · physically-based rendering · cross platform deployment (mobile, web, XR, desktop)

Cloud-Backed Deployment: distributed inference · Docker · vLLM · Node.js · AWS · Azure · Google Cloud

Research: qual/quant HCI evaluation · technical writing · experimental design and evaluation

Languages: English (Native) · Spanish (Native) · Mandarin Chinese (B1 level)

Peer-Reviewed Outputs

Wardle, M. 2025. *Materials for the Moon: Developing Physically Based Lunar Regolith Assets to Support Space Training and Simulation*. SIGGRAPH Asia 2025 Posters - https://doi.org/10.1145/3757374.3771428

Awards and Scholarships

2023 Arts and Humanities Research Council Collaborative Doctoral Research Scholarship

2022 Chair's Medal in Simulation and Visualisation, The Glasgow School of Art

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Teaching and Mentoring

Visiting Lecturer — Immersive and Interactive Technologies
University of St Andrews, The Glasgow School of Art

Delivering annual guest lectures on the theory and design of immersive systems for BSc Immersive Systems Design and MSc Serious Games and Virtual Reality at GSA and MA Art and Perception at St Andrews

Graduate Teaching Assistant — Immersive and Interactive Technologies
University of York

Supporting teaching delivery at undergraduate and postgraduate level on topics including 3D modelling, motion graphics, UX design, XR development, computer vision and machine learning for games.

Research Service

External Expert Evaluator, EU European Cooperation in Science and Technology (COST) Grants

Peer-Reviewer, ACM Designing Interactive Systems Conference and ACM Foundations of Digital Games

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Personal Projects

CrochetLM
Fine-tuning a 4B parameter model to beat frontier models (GPT, Claude, Kimi) in structured crochet pattern understanding and generation.