

Maki Wardle

Applied Researcher and Immersive Systems Designer

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I'm a PhD researcher and immersive systems designer, combining strong technical practice in real-time 3D with an interest in using human-centred experience design to reshape how people interact with the world around them. My experience includes building city-scale digital twins, using extended reality to support the future of space exploration and creating collective gameplay experiences that bring London's past to life.

Education

PhD Archaeology and Interactive Media, University of York and MOLA Archaeology
Hacking the Big Smoke: Alternate Reality Games and London's Archaeology
London and York, UK, 2023-2027

- Working with archaeologists at MOLA Archaeology to transform complex archaeological datasets into situated, immersive, alternate reality games that inspire collective speculative exploration and reimagining of London's urban landscape across past, present and future.
- Designing and evaluating experimental game prototypes spanning WhatsApp-based conversational interfaces, data sonification, and city-scale AR to explore large-scale, collaborative interaction and playful meaning-making with archaeological data at one of London's busiest public transit hubs.

BSc (Hons) Immersive Systems Design with 3D Modelling, The Glasgow School of Art
Grade: First-Class | Glasgow, UK, 2022-23

Experience

European Space Agency — PhD Intern in XR for Space Exploration
Harwell, UK, Jan-Jul 2025

- Conducting applied XR research to support lunar exploration within the agency's Exploration Research Preparation and Training (ExPeRT) Division.
- Developing an end-to-end physically based pipeline for photometric stereo capture and accurate real-time visualisation of lunar surface materials in Unreal Engine, in collaboration with ESA's VULCAN planetary geology facility. Presented outcomes as a poster at SIGGRAPH Asia 2025.
- State-of-the-art review and requirements definition for an adaptive AR-based human-machine interface (HMI) supporting mission controllers at the LUNA Analog Facility.
- Supporting cross-directorate research towards autonomous robotic technology demonstrators for a future lunar mission, with concepts presented at ESA's 2025 Ministerial Council.

Buro Happold — Graduate Geospatial 3D Web Mapping and Game Developer
London, UK, 2022-23

- Developing real-time, city-scale Unreal Engine digital twins, creating novel procedural techniques for shading hundreds of kilometres of CAD, GIS, and BIM data streamed from clients' geospatial data warehouses at runtime. Creating building geometry creation and manipulation tools enabling stakeholders to intuitively explore 'what if?' scenarios in real time.
 - Leading UX research and interaction design work packages for a £10M municipal digital twin project with the Saudi Public Investment Fund, including sourcing and supervising UI/UX sub-consultants.
 - Contributing to a successful Epic Games MegaGrant-supported R&D project. My work was commended by Epic's AEC lead: 'This goes so far beyond any engineering view I've ever seen.'
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Skills

Building Immersive Systems: Unity C# and Unreal C++ development for XR, web and mobile · design for spatial interaction · creating conversational user interfaces · full-stack prototyping

Rendering, Simulation and Visualisation: Real-time visualisation of complex spatial datasets at scale · physically based rendering · 3D modelling and digitisation · digital twins · geospatial data integration

Research and UI/UX: Research-driven rapid prototyping · qualitative and quantitative HCI research and evaluation · data analysis · technical and academic writing · workshop design and facilitation

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*. In ACM SIGGRAPH Asia 2025 Posters (SA Posters '25), December 15-18, 2025. <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

Teaching and Mentoring

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

- Delivering annual guest lectures on the theory and design of immersive and interactive systems for BSc, MSc and MRes programmes.
- Participating in critiques of student projects as an invited external expert.

Graduate Teaching Assistant — Immersive and Interactive Technologies
University of York

- Supporting teaching at MSc level on advanced interaction techniques, virtual reality development and ML-based natural interaction in Unity.
 - Mentoring for student projects in prototyping and evaluation of interactive and immersive interfaces.
 - Contributing to introductory teaching in interactive media and 3D content creation.
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Research Service

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

Peer-Reviewer, ACM Designing Interactive Systems Conference
