

Korea-EU Horizon Europe Researchers Networking Forum on Energy & Advanced Mobility

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Gamification &
Simulation Technology**

**The Sir Peter Rigby Digital
Futures Institute,
Aston University**

**Digital Twins
Mixed Reality
Gamification**



1. Introduction to Aston University

Aston 2030 strategic aims

Inclusive, Entrepreneurial, Transformational

1. Elevate Ambition
2. Create Value
3. **Leverage our Place**
4. **Build Digital Enterprise**
5. **Transform Business and Communities**

Our new Research Strategy speaks directly to these aims. It links in with notably the People Strategy and the Enterprise Strategy, which will focus on pathways to impact through partnerships, and in particular through **research-led innovation**, translation and **commercialisation**.

Progressive!

[QS World University Rankings 2026](#), Aston University is ranked **395th** globally, placing it in the **top 5% of universities worldwide**.

25th in the UK in the Guardian University Guide, 2024.

Aston University has risen to **66th place in the world** (into the top **10 in the UK**) in the 2024 QS World Rankings by Subject for **Business and Management Studies**



1.1 Introduction to SPR Digital Futures Institute

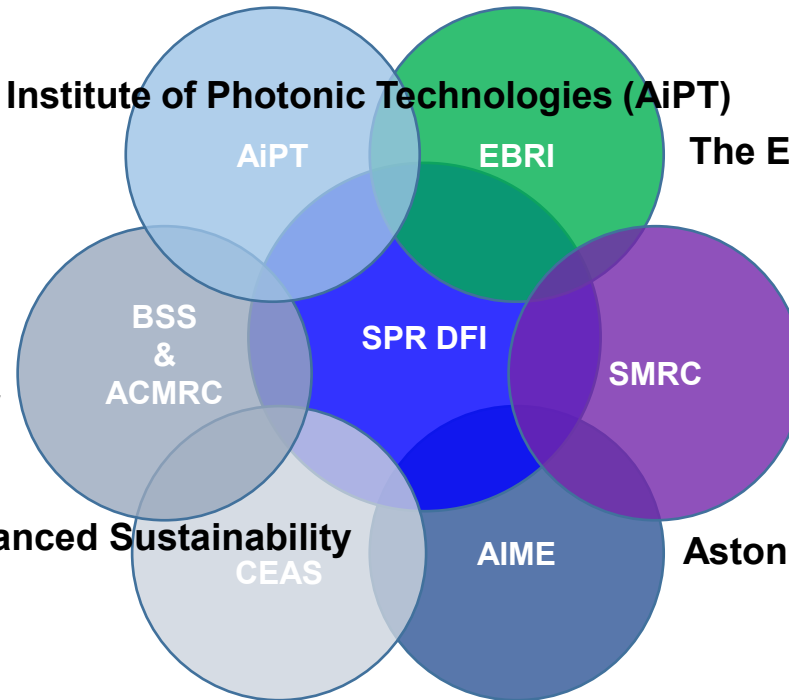
Strong **Interdisciplinary** collaboration:

- EPS (Engineering & Sciences)
- BSS (Business & Social Sciences)
- HLS (Health & Life Sciences)

Aston Business School
Aston Crisis Management Center

Aston Institute of Photonic Technologies (AiPT)

The Energy and Bioproducts Research Institute



Smart and Sustainable Manufacturing Research Centre

Aston Institute for Membrane Excellence

Centre for Circular Economy and Advanced Sustainability

Aims:

Galvanise and expand the University's research footprint in the **Digital Tech** space.

Build **strategic partnerships** in this area with **businesses and public sector** to drive innovations and impact

Focus on **society's digital future** and influence **socially responsible transformations** and sustainable growth

Contribute to the economic regeneration of Birmingham and the West Midlands through **digital transformation**.





2. Expertise

Digital Twins, Digital Transformation, Datafication & Data Analytics, Mixed Reality Simulation & Visualisation design, Human Computer Interaction, Gamification

- **52 competitive grants** and published **240 papers** with **4003 citations (h-index 27 and i10 71)**,
- supervised 11 postdocs and 117 postgraduate students (17 PhD, 4 MSc, 7 Honours, 34 MIT projects, 48 MIT Special Topics, 10 MEng and 60 MIT/MEng internships), currently supervising 3 Postdocs and 7 PhD students
- generated a total research income of over **£16.8 million**.

Current grants:

- **2025-2026 UKRI Innovate UK** Council Reference: TS/U004618/1 Proposal Title : **DIATOMIC (Digital InnovAtion TransfOrMatIve Change)** 10157662 Proposal Scheme : Technology Strategy Board - CR&D, Diatomic 1 Year Extension (Competition name: Innovation project commission West Midlands – Extension, Competition type: CR&D, 1.4.2025- 31.3.2026 (£1.8m)
- **2023-2025 UKRI Innovate UK West Midlands Innovation Accelerator** project, **Diatomic (Digital InnovAtion TransfOrMatIve Change)** UK Accelerator, Application number: 10055175, Institutional Grant £6,207,573
- **2024-2028, NSF China** (National Science Foundation Grant no: 72371064), Empirical Research on HCI & UX design of **gamified XR emergency training systems**, A/Prof Manning Li, Prof Manolya Kavakli, Northeastern University, China (5.5m USD)
- **2024-2007 Call: HORIZON-JU-ER-2023-01, EU-RAIL JU Call 2023-01, Nexus: Next-Gen technologies for Enhanced Metro Operations**, 3m GBP



3. EU Call

Targeted call: [Cluster 5 Call 02-2026 \(WP 2025\) \(HORIZON-CL5-2026-02\)](#) **Deadline:** 17 February 2026 17:00:00

Main objectives: A key challenge remains the accelerated uptake of such solutions in building and renovation projects involving **Building value chain actors** - such as housing association, municipal and regional authorities, or policy makers

Outcomes:

1. **Improved planning methods and procedures** which are replicable and scalable across Europe, and potentially **globally**, and that embed the uptake of **building solutions to improve whole life carbon performance, circularity, sustainability, climate resilience, safety and durability** of buildings and the built environment;
2. **Measurable increase in the number of relevant value chain actors** applying such planning methods, procedures and building solutions for the benefit of citizens;
3. **Quantified pathways** to improved buildings' and built environment's whole life carbon performance.



3. Project Idea

My plan is to use **Digital twins** and develop a **BIM/BMS/compliance/AI/VR integrated platform** for City Councils/Building Owners to use. Digital Twin can be used to measure energy consumption in planning phase.

A few companies from UK to join us as well developing Digital Twins:

GridEdge, Aston Start Up, BMS system for energy optimisation for buildings

Purple transform, SiYtE, cloud-based AI/BMS/IoT integration system for Smart Analytics

GeoSpatial, Arevi Decision intelligence for planners

Underheath AI, heathpump and grid simulation using data from GeoSpatial

They want to have **3 different climate conditions in Europe**.

Use Case1: Birmingham (ASTON, UK)

Use Case2: Chalon (ENSAM, France)

Use case 3: Spain (BURGOS UNIVERSITY)

Use case 4: Korea, high rise Buildings Ulsan Municipality

(UNIST, Korea) Dr. Jeongseob Kim (Assistant Professor - specific interest in **Buildings & Housing** and Mobility)



4. Profile You are Seeking and Why

WP0: Stakeholder Analysis, Co-design and Requirements Analysis (All)

WP1: Integrated system development

- **UK:** We can do the integrated **DT system development** in UK.

WP2: Stakeholder engagement through immersion and collaborative design

- **France:** We can add **VR into the Digital Twin** system for immersion of
- citizens/planners for ENSAM team to be involved.

WP3: Intelligent Decision Making & Planning

- **Spain: University of Burgos (LLMs for planning and AI for impact assessment)**

WP4: Evaluation

- **Germany: Social Sciences and Humanities** by Karlsruhe &
- **Germany: TAM** by Wiesbaden

WP5 Project Management

- **UK**

WP6 Dissemination and Exploitation (All)

- **Develop and validate replicable and scalable planning methods and procedures**
- **Validate the planning methods, procedures and sets of building solutions** in a relevant environment **in at least three countries, with different climatic conditions and building stock characteristics**. In at least two cases, the proposed planning methods and procedures should be **relevant for renovation**;
 - **Birmingham City Council, Aston and BCU & Chalon Council**
- **Investigate the use of innovative tools and methods which facilitate the adaptation of the buildings stock to changing user needs**, while positively contributing to occupants' comfort and health;
 - **Using an integrated BIM/BMS/Compliance Digital twin as a Planning Platform**
- **Propose and apply a methodology for assessing the effectiveness of the developed pathways for the decarbonisation and climate resilience of buildings and the built environment**, including the calculation of their whole life carbon reduction compared to a "business as usual" scenario;
- **Sustainable energy: solar & hydrogen what if scenario analysis (KOREA)**
- **Ensure the active involvement of all relevant public and private stakeholders of the whole renovation and construction value chain**, which must include among others: municipalities, citizens (including vulnerable groups) and civil society organisations
- **Contribute to the objectives of the Built4People partnership**



5. Contact Details

FOR ALL PRESENTERS

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