Gareth Walsh PhD

Human-AI Interaction · Visual Analytics · HCI · Adaptive Decision Support

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PROFILE

Interdisciplinary researcher in visual analytics and human-computer interaction with a PhD from the University of Southern Denmark, defended in September 2025. Research experience spans interactive decision-support systems, uncertainty and situational awareness, autonomous/subsea systems, and human-machine teaming. Taught 100+ MSc students per semester on Visual Data Analytics, supervising around 30 student dashboard projects per semester. Cross-sector experience at the European Commission and ASD Europe adds expertise in European R&D, technical standards, interoperability, and international stakeholder coordination.

RESEARCH FOCUS

Human-AI collaboration	state-dependent coordination, mixed initiative, appropriate reliance
Visual analytics & HCI	interactive decision support, uncertainty, information abstraction
Autonomous systems	human supervision, UUVs, complex operational environments
Methods	prototyping, human-centred design, experimental evaluation, data analysis

SKILLS

Programming and data	Python (Pandas, NumPy, SciPy, Matplotlib, Plotly, Dash), Anaconda, JavaScript / Node.js / Express, HTML / CSS / Bootstrap, Git, D3.js (developing)
Design	Figma, Adobe XD, Adobe Creative Suite; human-centred design, interactive prototyping, accessibility (WCAG/ARIA-aligned practice)
Agentic AI	Self-directed learning since July 2026; simple AI agents with a human in the loop (practical, early-stage work)
Languages	English (native), German (B2), Irish (A2), Danish (A1)

EDUCATION

PhD — 2022 – 2025

University of Southern Denmark, Department of Mathematics and Computer Science (IMADA) · Defended 23 September 2025

Thesis: “Visual Interaction Design for Sub-Sea Military Operations in the Context of European Defence”. Principal supervisor: Prof. Stefan Jänicke. Research in human-computer interaction, visual analytics and interface design for subsea operations.

MSc Interactive Digital Media — 2020 – 2021

Trinity College Dublin, School of Computer Science and Statistics · Distinction

Dissertation: “The need for greater emphasis on eudaimonia in the design process of virtual environments”. Modules included UX, Programming for Digital Media, Contextual Media, and Visual Computing and Design.

BSc Architectural Science — 2015 – 2018

University College Dublin · Upper Second Class Honours (2.1), GPA 3.38/4.2

RESEARCH EXPERIENCE

PhD Researcher / PhD Fellow — May 2022 – September 2025

University of Southern Denmark (SDU), Department of Mathematics and Computer Science (IMADA) / Centre for Visual Data Science · Odense, Denmark

– Developed and evaluated visual analytics and decision-support approaches for complex operational environments; iterative design and evaluation informed peer-reviewed papers and the PhD thesis.

- Produced a first-author publication record spanning systematic visualisation surveys, interaction/symbology design and incident-analysis tools, with peer-reviewed outputs at IVAPP, EuroVis/VisGap and Springer.
- Built the visualisation dashboard for rebreather incident reports introduced in the IVAPP 2024 paper, in Python with Dash and Plotly, plus some JavaScript.
- Led front-end and visual-interface design for CUIIS, a three-year EU-funded EDIDP project with 18 partners across 7 EU member states and a budget of just over €5 million, translating operational requirements into desktop and underwater interfaces for diver/UUV monitoring, navigation, mission coordination, uncertainty and situational awareness.
- Designed interactive geospatial interface modules that let commanders monitor and coordinate mixed teams of human clearance divers and unmanned underwater vehicles (manned-unmanned teaming), and interfaces presenting near-real-time UUV telemetry and physiological data from divers' sensors.
- Validated interface concepts with end-users from the Varna Naval Academy (divers and UUV operators) and integrated field-trial findings into the development of visual analytics and decision-support tools.
- Facilitated fortnightly cross-partner design reviews, and contributed to field demonstrations and project reviews in Varna, Sofia, Gdynia and Brussels (see Presentations).

TEACHING AND SUPERVISION

- Teaching assistant, Visual Data Analytics (DM878), University of Southern Denmark: 100+ MSc students per semester from the MSc in Data Science. Delivered a weekly lecture-style exercise class (about one hour) followed by hands-on desk tutorials, covering design principles, perceptual theory, data abstraction and visualisation methods.
- Supervised around 30 student projects per semester, individual and group, in which each student produced a working dashboard from a dataset of their choosing.
- Co-supervised the three EuroVis 2024 poster projects; mentoring on the course, including feedback on papers before submission, contributed to six co-authored student papers in all (EuroVis 2024, GRIVAPP 2026).

PROFESSIONAL EXPERIENCE

Standards and Services Manager
November 2025 – July 2026

ASD Europe (Aerospace, Security and Defence Industries Association of Europe) · Brussels, Belgium

- Led international coordination and governance of the six ASD/AIA S-Series Integrated Product Support specifications (S1000D, S2000M, S3000L, S4000P, S5000F and S6000T).
- Managed technical and governance groups across European and international industry, aligning stakeholders on interoperability, lifecycle information, change management and standards strategy.
- Worked with industry representatives from large primes including Airbus, Saab and Rolls-Royce to coordinate standards priorities.
- Represented ASD in international forums and engagements across Europe and the United States, working across industry, government and standards organisations.

Blue Book Trainee, DG DEFIS, Unit A3
March 2024 – July 2024

European Commission, Directorate-General for Defence Industry and Space (DG DEFIS) · Brussels, Belgium

- Provided in-depth support for the development of KPIs for annual monitoring and evaluation of the European Defence Fund (EDF) and of defence innovation support under the EU Defence Innovation Scheme (EUDIS).
- Designed a targeted KPI system for evaluating SMEs, start-ups and other non-traditional players in the defence industrial ecosystem, delivered as an Excel sheet and a report; prepared aggregated information on EDF call statistics and EUDIS questionnaires.
- Supported international events and briefings, including the EDA Maritime Workshop, a European Defence Innovation Network meeting, TechChill and Hannover Messe (coordinated and curated a panel discussion on EDF funding).

Interactive Media Designer November 2021 – January 2022
ADAPT Centre for AI-Driven Digital Content Technology, Trinity College Dublin · Dublin, Ireland
- Developed interactive content for public engagement, communicating research in AI-driven media interaction, natural language processing and digital humanities to diverse audiences.
- Redesigned digital interfaces with an emphasis on accessibility and user experience, applying WCAG/ARIA-aligned practice.

Architectural Designer September 2019 – March 2020
Aedas London Ltd, Arts and Commercial teams · London, United Kingdom
- Produced digital and 3D visualisations for large-scale architectural projects, translating complex design information into visual outputs for multidisciplinary design teams.

PUBLICATIONS

1. Walsh, G., Andersen, N. S., Kusnick, J., Sørensen, E. A. W. B., & Jänicke, S. (2024). Visual Analysis of Military Diving Incident Reports. IVAPP 2024, pp. 749–758. DOI: 10.5220/0012577700003660.
2. Walsh, G., Andersen, N. S., Stoianov, N., & Jänicke, S. (2024). Visualizing Military Operations: Extended Geospatial-Temporal Survey. Communications in Computer and Information Science 2103, pp. 374–396. Springer. DOI: 10.1007/978-3-031-66743-5_17. Extended version of publication 5.
3. Walsh, G., Andersen, N. S., Stoianov, N., & Jänicke, S. (2023). The Lack of Specialized Symbology and Visual Interaction Design Guidance for Sub-Sea Military Operations. VisGap @ EuroVis, pp. 19–26. DOI: 10.2312/visgap.20231117.
4. Walsh, G., Andersen, N. S., Stoianov, N., & Jänicke, S. (2023). Towards a New Symbology and Visual Interaction Design for Sub-Sea Military Operations. EDA Research, Technology and Innovation Papers Award 2023, pp. 24–31. Published in the proceedings document.
5. Walsh, G., Andersen, N. S., Stoianov, N., & Jänicke, S. (2023). A Survey of Geospatial-Temporal Visualizations for Military Operations. IVAPP 2023, pp. 115–129. DOI: 10.5220/0011902500003417.

THESIS AND PREPRINTS

- Walsh, G. (2025). Visual Interaction Design for Sub-Sea Military Operations in the Context of European Defence. PhD thesis, University of Southern Denmark.
- Walsh, G., Andersen, N. S., Filipov, V., Kehayov, T., Manjukov, M., & Jänicke, S. (2024). Advancing C3S Systems for Subsea Tactical Operations: Insights from the CUIIS Project. Preprint, SSRN 5464354.
- Walsh, G., Peters, D., & Jänicke, S. (2025). Visual Insights into European Defence: Mapping Policies, Institutions, and Capabilities. Unpublished preprint, 3 February 2025.

MENTORED STUDENT PAPERS

- Lamp, F. J., Møller, J. B., Sørensen, E. B., Walsh, G., Kusnick, J., & Jänicke, S. (2024). Visual Analysis of Wind Turbines in Denmark. EuroVis 2024 (Short Papers).
- Thomasen, M. M. D., Jørgensen, M. V., Svendsen, L. S., Sørensen, E. B., Walsh, G., Kusnick, J., & Jänicke, S. (2024). Towards Sustainable Wildlife Management through Geospatial-Temporal Visual Exploration. VisGap @ EuroVis 2024.
- Wang, J. M., Sørensen, E. B., Walsh, G., Kusnick, J., & Jänicke, S. (2024). A Visualization Tool for Private Investors: Stock Portfolio Planning and Risk Management. EuroVis 2024 (Posters).
- Pedersen, D. P., Hansen, L. I. K., Sørensen, E. B., Walsh, G., Kusnick, J., & Jänicke, S. (2024). Interactive Visual Exploration of Arctic Sea Ice Extent 1978–2023. EuroVis 2024 (Posters).
- Lund, K. N., Rosenfjeld, M., Vendelsøe, A. N. H., Sørensen, E. B., Walsh, G., Kusnick, J., & Jänicke, S. (2024). Visualizing Property Assessments and Taxation: A Danish Case Study. EuroVis 2024 (Posters).
- Vrede, N. E., Sørensen, E. B., Walsh, G., Kusnick, J., & Jänicke, S. (2026). Interactive Visual Analysis of the Danish District Heating Grid. GRIVAPP 2026, pp. 488–495 (SCITEPRESS).

PRESENTATIONS

- IVAPP 2023, Lisbon (full paper talk): “A Survey of Geospatial-Temporal Visualizations for Military Operations”
- VisGap workshop @ EuroVis 2023, Leipzig (workshop talk): “The Lack of Specialized Symbology and Visual Interaction Design Guidance for Sub-Sea Military Operations”
- IVAPP 2024, Rome (poster presentation): “Visual Analysis of Military Diving Incident Reports”
- CUIIS final field demonstration, Varna, Bulgaria: showcased the visual user interface and represented SDU’s work, with European Commission project officers present
- CUIIS project presentations at the Polish Naval Academy (Gdynia), the Bulgarian Defence Institute and a project review in Sofia, and at the EDF Info Days in Brussels
- PhD defence, University of Southern Denmark, 23 September 2025

SERVICE

- Elected PhD student representative at IMADA, January 2024 – February 2025: represented PhD students on the department committee, including reviewing PhD applications.
- Elected representative for IMADA to the Faculty of Science Philos Network, November 2023 – February 2025: organised interdisciplinary PhD events each semester.
- Elected spokesperson (porte-parole) for DG DEFIS trainees on the European Commission Trainees Committee, March – July 2024.