Ollscoil Mhá Nuad
Maynooth University

Maynooth University
National University of Ireland Maynooth

Research and Innovation Overview 2024
Department of Computer Science

The Department of Computer Science at Maynooth University remains a leader in the field, hosting 30 academic staff members and researchers in 2022-23, along with 30 postgraduate students. The department produced 51 research publications during the year, spanning journal articles, conference papers, and technical reports. With research grants exceeding €2.1 million, the department is at the forefront of advancing knowledge in key areas of computer science, from artificial intelligence to computer vision.

Head of Department: Dr Aidan Mooney

Research Themes and Focus Areas

The department's research covers a diverse range of topics, with core focus areas including:

- **Artificial Intelligence and Machine Learning:** Faculty members contribute to AI research in areas such as autonomous systems, deep learning, and natural language processing.
- **Computer Vision and Pattern Recognition:** The department is involved in cutting-edge research on visual perception, including the development of advanced techniques for object detection and motion segmentation.
- **Computational Thinking and Education:** The department's work in this area focuses on promoting computational thinking in primary and secondary education through teacher training and outreach programmes.

Significant Research Outputs

In 2022-23, the Department of Computer Science produced several notable publications and secured prestigious research awards, reflecting the department's excellence in research:

Publications

- Several high-impact papers were accepted at top conferences, including CVPR (Computer Vision and Pattern Recognition) and INTERSPEECH, two of the leading venues in computer vision and signal processing.
- Professor John McDonald and Dr Louis Gallagher co-authored a paper on novel monocular mapping systems in collaboration with Valeo Vision Systems

Awards

- The department received significant research funding, including €2.1 million from the SFI Discover Programme and the EPA. Key projects include CoCoA 23, led by Dr Kevin Casey, and CoPilot-AI, a defence challenge focusing on autonomous sensor technologies.
- Professors Pearlmutter and Naughton were recognised among the top 18 computer scientists in Ireland by Research.com and are listed in Elsevier's top 2% most-cited scientists globally.

Collaborations and Partnerships

The department maintains strong collaborative ties with industry and academic partners both nationally and internationally.
Key partnerships include:

- **Industry Collaborations:** Successful funding awards have been supported by significant industry funding, including the SFI Defence challenge "CoPilot-AI" project led by Professor Tim McCarthy, SFI Research Centre Lero led by Professor John McDonald), and funding from Microsoft (with Professor Tim McCarthy).
- **Research Networks:** The department's PACT programme fosters collaboration between computer science researchers and primary and secondary school teachers, supporting computational thinking education across 33 schools in Ireland.

Research Impact and Societal Contributions

The department's research contributes significantly to public engagement and societal change. Professor Tim McCarthy's work on autonomous sensor technologies for wildfire emergency response, funded by the SFI Defence Organisation Innovation Challenge, exemplifies the department's commitment to applying technology for public good. Additionally, the department's Urban Sustainability App, developed in collaboration with Kildare County Council, raises awareness about sustainable land management practices.

Future Directions

The department will continue to build on its strengths in AI, computer vision, and computational thinking, with plans to expand collaborations in education and industry. Future projects will include further development of AI technologies for autonomous systems and the application of machine learning in healthcare and environmental monitoring.

The Department of Computer Science at Maynooth University remains a national leader in research and education, consistently producing impactful work in key areas of technology. With strong research outputs, innovative collaborations, and a commitment to societal engagement, the department continues to shape the future of computing in Ireland and beyond.

Find out more **www.maynoothuniversity.ie/computer-science** **Email** **computerscience.department@mu.ie**