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Pioneering camera technology set to revolutionise high-speed imaging

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A ground-breaking research project at Heriot-Watt University is set to be commercialised with funding from Scottish Enterprise's (SE) High Growth Spinout Programme. The project, which has developed an advanced camera technology with consistent, full colour, HD resolution at millions of frames per second (Mfps), is set to revolutionise how biomedical science, engineering, and combustion research is conducted.

It is hoped the new technology will extend beyond traditional research and development to support industries across rail transportation, manufacturing, medicine, and quantum photonics where demand for high-speed imaging has been identified by the team at Heriot-Watt University.

The commercial application of high-speed cameras requires significantly faster image acquisition to capture the detail of extremely rapid, often transient events in applications such as microfluidics, fluidic dynamics, and ballistics studies.

Most existing high-speed imaging systems achieve ultra-high frame rates at the expense of image resolution, making image quality a significant challenge. Additionally, these systems are very expensive, creating a potential financial barrier to industry and research organisations wishing to access the

technology.

The unique camera developed by Heriot-Watt University uses a novel architecture and advanced mathematical algorithm to deliver high resolution images across its full speed range. Importantly, this has been achieved at a notably lower manufacturing cost than other market products by using ‘off-the-shelf’ components, making access to high-speed imaging more affordable.

Dr Xu Wang is the inventor of the technology and an associate professor in the Institute of Photonics and Quantum Sciences at Heriot-Watt University. He said: “The most significant limit of existing high-speed cameras is poor resolution at high-frame rate coupled with high cost. Our ground-breaking camera technology provides an affordable market solution that delivers ultra-high speed without compromising high resolution thanks to its superior design and lower manufacturing cost.

“This funding will accelerate the commercialisation of our research to create a product capable of disrupting existing and new markets. The support of the enterprise team at Heriot-Watt University and Scottish Enterprise provides an incredible opportunity to build a profitable, industry-leading business at pace that is focused on driving further innovation in the field of camera technology in Scotland and beyond.”

Victoria Carmichael, Director of Strategic Investment at Scottish Enterprise, said: “Our High Growth Spinout Programme works with leading academics all over Scotland to help turn their innovative ideas into successful business ventures. Scotland has a long history of world-changing ingenuity and the team at Heriot-Watt has, with this camera, created a truly industry-changing and cost-effective product with the potential to deliver enhanced results for both commercial businesses and academic institutions. In Scotland we are very fortunate to have a host of enterprising, world-leading universities that can help drive economic recovery and growth in key sectors.”

David Richardson, Chief Entrepreneurial Executive at Heriot-Watt University, commented: “Heriot-Watt University has an extensive track-record of delivering commercial, strategic and innovation support that drives real-life impact of academic discovery in existing and new industry markets. With the financial backing of Scottish Enterprise, we look forward to developing Dr Wang’s research into a world-class enterprise capable of disrupting the status-quo in high-speed imaging.

“Our GRID facility brings together a diverse range of skills and expertise that fosters a highly collaborative environment where academics can transform their research into innovative, industry-leading businesses. We look forward to working in partnership with all those involved to access a world-class talent pool, R&D opportunities and further investment to help deliver scale at pace.”

Janet Milne, CEO Designate and Director, Genmhor Ltd: “Genmhor is delighted to be working with Dr Wang, Heriot-Watt University and Scottish Enterprise, to bring this exciting new imaging technology to market. This innovative, ultra-high speed camera has the potential to be a game changer in the market, offering full colour, full resolution, megapixel images at millions of frames per second. The potential industrial and academic applications for this novel imaging solution are vast and we are very excited to be leading the commercial development of this opportunity.

“Genmhor has extensive experience of delivering investable propositions for early-stage technologies and making products a reality.”

Find out more about GRID at Heriot-Watt University.

Photo credit: Heriot-Watt University