The group’s expertise is diverse and spans various fields including the following research areas:

• Affective systems
• Simulation
• Virtual and augmented reality and 3D visualisation
• High performance computing for audio applications
• Ubiquitous systems
• Novel hardware
• Sensor networking
• Human-Computer Interaction (HCI)

The Visual, Affective and Pervasive Systems Research Group is led by Dr Vassilis Charissis, an award-winning computing design engineer who joined Glasgow Caledonian University (GCU) as a Reader in 2010 from the Digital Design Studio (DDS), a postgraduate research and commercial centre of Glasgow School of Art / University of Glasgow. Dr Charissis has participated in multiple commercial and academic projects investigating Human-Computer Interaction (HCI) as well as acting as a 3D and VR visualisation specialist for vehicles (Ford, Suzuki), ships (QinetiQ, Fisher Defence, Singapore Marine Technologies), buildings (Glasgow City Model), defence (Thales, QinetiQ) and mechanical engineering explanatory simulations. Research interests focus on the Human-Machine Interaction (HMI), design and evaluation of Head-Up Display (HUD) Interfaces, driving simulator development, driver behaviour, concept product design, 3D visualisation, Virtual Prototyping, and Human Factors engineering.

Virtual Reality simulation and 3D visualisation are extremely effective means of bringing complex ideas and conditions to life and have ever-expanding applications in science, education, health and engineering fields. Researchers in the Visual, Affective and Pervasive Systems Research Group are using virtual prototypes in unique healthcare and automotive applications.

The group has developed a unique laboratory at Glasgow Caledonian University to explore imaginative and novel uses of advanced 3D digital visualisation and interaction technologies. The lab can be used for investigating new groundbreaking methods for maximising the usability of HUD interfaces with the use of real-time information streaming through Vehicular Ad-hoc Network systems.
and developing Virtual Reality, 3D and HCI models for healthcare training. In work for the Royal College of Surgeons in Edinburgh and the Royal College of Physicians and Surgeons of Glasgow, researchers have investigated the use of virtual reality interfaces for medical applications and surgical rehearsal. NHS Education for Scotland (NES) has also provided funding for the development of a pilot 3D computer interface for GPs, a web-based application called 3D Medical Education, which is currently in user testing with doctors with a view to having national transferability. There is potential for advanced simulation and 3D visualisation techniques to be developed further for local authorities, fire and ambulance services to monitor traffic flow in busy cities and for establishing the impact of new building developments on roads and the environment. The group has further expertise in applied research in the area of user centred software development approaches and in the presentation of information to support decision making.

Other unique equipment used by the Visual, Affective and Pervasive Systems Research Group includes the eMotionLab, which offers both students and business clients the knowledge and expertise needed to operate in a virtual world, with User-centred Interaction Design research activities. The lab focuses on affective gaming and game technology supporting health and education. The group has worked on several research projects with industry including a Knowledge Transfer Partnership (KTP) with Bunnyfoot Ltd developing an emotional analysis software tool that can be used to show how computer game content elicits player emotions.

The Visual, Affective and Pervasive Systems Research Group has helped to develop the world’s first fully-integrated first aid system in a mobile app to help people take action during a medical emergency. Researchers teamed up with Lifesapps, a Scottish company that develops mobile products to protect, save and enhance lives. Its first product iCEaid is an intuitive medical know-how mobile app powered by reference book publisher Dorling Kindersley’s best selling First Aid Manual, which was authorised by St John Ambulance, St Andrew’s First Aid and the British Red Cross.

The group includes psychologists with research interests in music in video games, game-based music learning, interactive entertainment design and games for health. Music games present a highly pervasive new digital platform to create, perform, appreciate and transmit music through peer and online communities, and are one of the biggest selling video game genres. Previous research highlights the power of music participation to enrich cognitive, social and emotional wellbeing, while a growing body of work highlights the educational potential of digital games to enrich personalised learning across the curriculum.

At Glasgow Caledonian University, we work with industry and public sector partners to ensure our expertise responds to the need for real-world innovation. GCU’s strategic business development and knowledge transfer teams work with academic experts in our Schools and Research Institutes to support businesses with a problem-solving approach.

Contact us to find out more about building a brighter future with GCU at www.gcu.ac.uk/business.