



Image Processing & Analysis Core

Vision Systems Group

The Vision Systems Group (VSG) is the key **university recognised research group** working in the area of **Image Processing & Analysis (IPA)**.

Our digital and non-digital IPA research programmes relate to issues involved in the **acquisition (custom sensor design), processing, quantitative analysis, classification, visualization and systems engineering (integration) for a wide range of computer vision applications**. Specifically the group focuses on the issues involved in the automation or semi automation of **image feature segmentation**, and its associated **quantitative analysis**, at both a micro and macro level.

The Vision Systems Group (VSG) and its associated Vision Systems Laboratory (VSL) was formed in 1990 by Prof. Paul Whelan, as a forum to co-ordinate and support the promotion of computer and machine vision research in DCU. In 1999 Prof. Whelan formed the Medical Imaging and Visualization Laboratory as a focus for medical imaging research within DCU. The Vision Systems Group currently consists of a core team of 20 researchers [3 Faculty, 6 full time research staff (incl. 1 clinical coordinator), 9 PhD students, 2 Research Masters students] working on computer vision (specifically image segmentation), medical imaging (specifically computer aided detection / diagnosis) and their associated visualization projects. In addition to the core team we have 4 adjunct faculty members based in the Mater hospital and the RCSI.

The **core expertise** provided by the Vision Systems Group in DCU is in its ability to develop and design novel computer based solutions that will allow the **automatic extraction of key image features [specifically from 2D, video, 3D and 4D data sources]** with a view to a **robust and reliable quantitative analysis of the key information/data within the scene**. As well as undertaking applied and basic research into a range of imaging problems, the VSG is also involved in the transfer of computer and machine vision techniques from the research environment to Irish industry and hospitals. Current projects include:

Machine Vision:	3D Imaging / Industrial Vision, Colour Texture Analysis Visually Guided Robotic Mobile Platforms, High resolution 3D image acquisition systems, 3D imaging of biological surfaces
Medical Imaging:	Functional Analysis of Cardiac Images, Morphological Analysis of the Colon, Computer Aided Diagnosis for Virtual Colonoscopy, Skin Cancer Feature Detection and Measurement, Application of computer vision to the life science community.
Visual Biometrics:	Real-time Motion Segmentation and Tracking, Face feature segmentation and classification.
Image Visualization:	3D Modelling, Medical Visualization

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