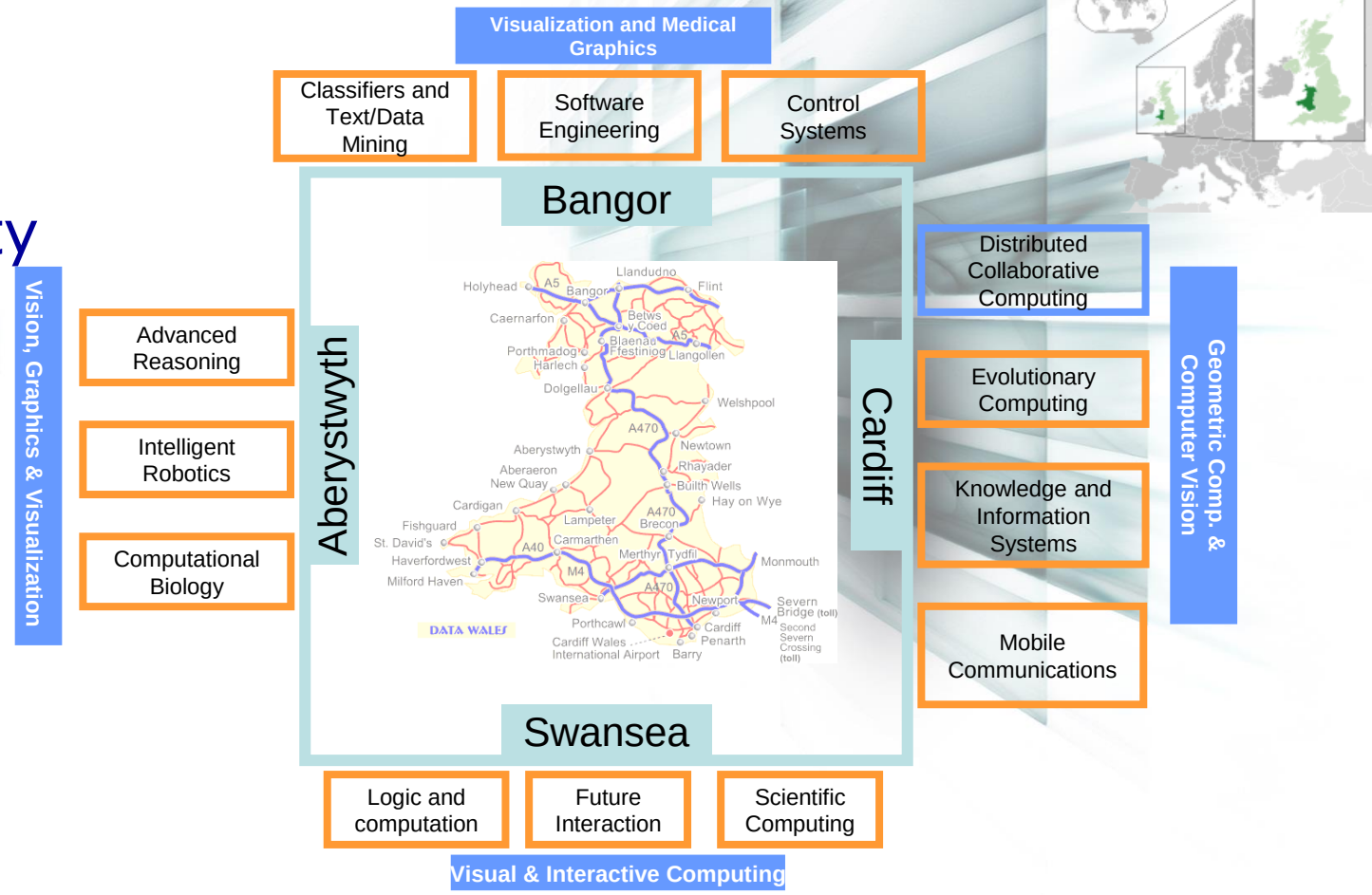
RIVIC
Research Institute of Visual Computing
http://www.rivic.org.uk/

Partners

- Aberystwyth University
- Bangor University
- Cardiff University
- Swansea University



Staff and Student numbers

- Aberystwyth
  - 7 Academics, 8 Research Officers, 16 PhD Students
- Bangor
  - 6 Academics, 6 Research Officers, 11 PhD Students
- Cardiff
  - 7 Academics, 7 Research Officer, 5 PhD Students
- Swansea
  - 8 Academics, 7 Research Officers, 6 PhD Students

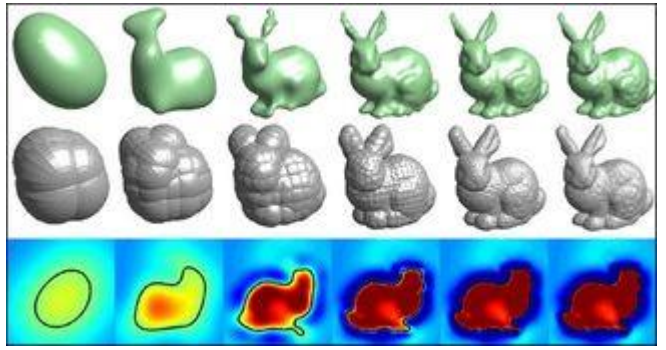
RIVIC Graduate School

Research Cross-Cutting Themes

- Volume Graphics and Visualization
- Video Processing and Video Visualization
- Vision-based Geometric Modelling
- Virtual Human Modelling and Augmented Reality
- Scientific Visualization and Information Visualization
- Scientific Foundation of Visual Computing Interfaces
- Medical Image Processing and Analysis

Volume Graphics and Visualization

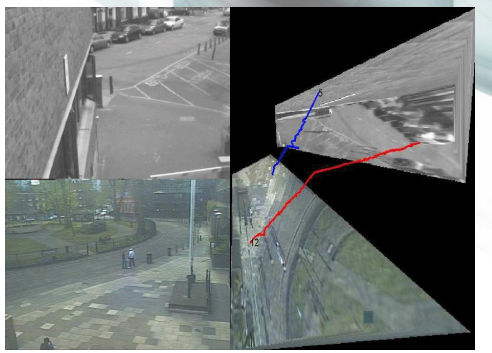
- Distance Fields
- Procedural Representation
- Real Time Ray Tracing
- GPU Acceleration



Video Processing and Video Visualization

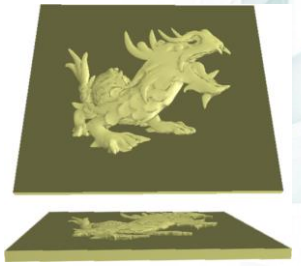
- Video Processing
- Camera Tracking
- Automatic extraction of meaningful information from videos
- Applications range from entertainment to surveillance systems

Making a cartoon style rendering of an input video

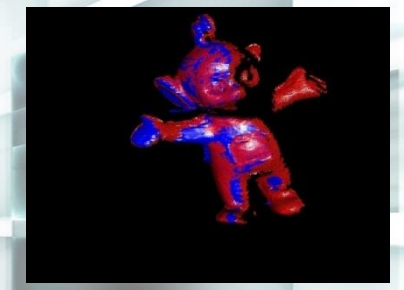


Vision-based Geometric Modelling

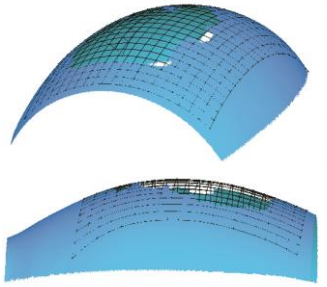
- Relief Computation
- Surface Registration
- 3D Free-form Surface Modelling and Analysis



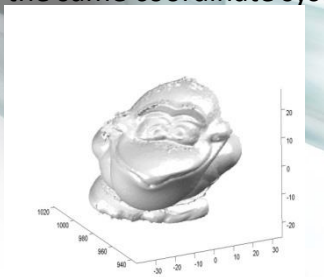
A 3D model of a dragon has been processed into the form of a base relief



The images captured from nearby viewpoints are aligned into the same coordinate system.



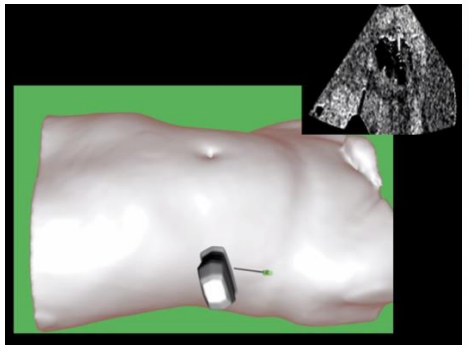
Estimating the base surface underlying a relief scanned from a piece of porcelain

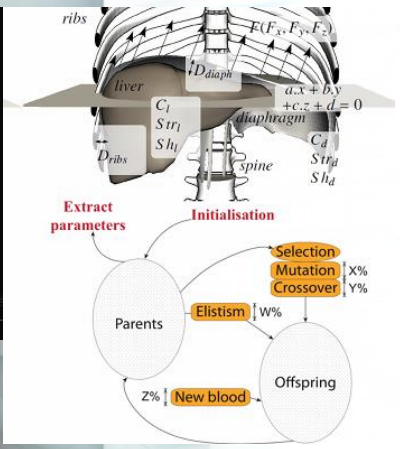


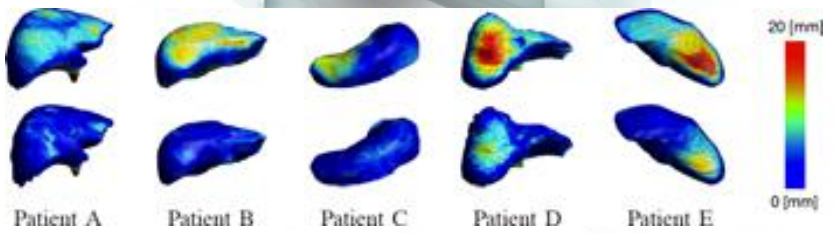
A bird model is built from 20 images

Virtual Human Modelling and Augmented Reality

- Medical Virtual Environments
- Advanced Display Technologies
  - The Virtual Window
  - Naturally viewed Displays
- Physiological Modelling
- Simulated Arterial Cells
- Embodied Virtual Humans

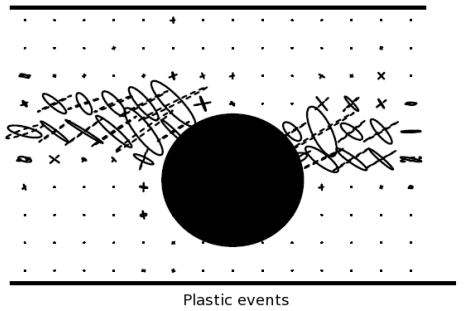


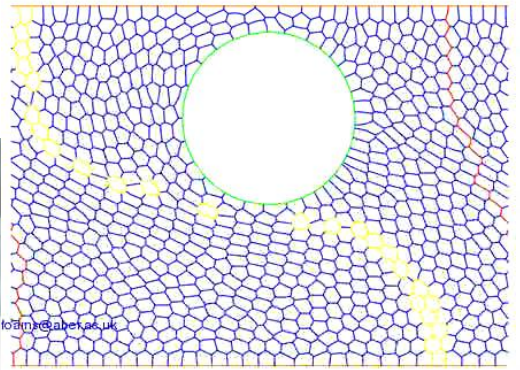


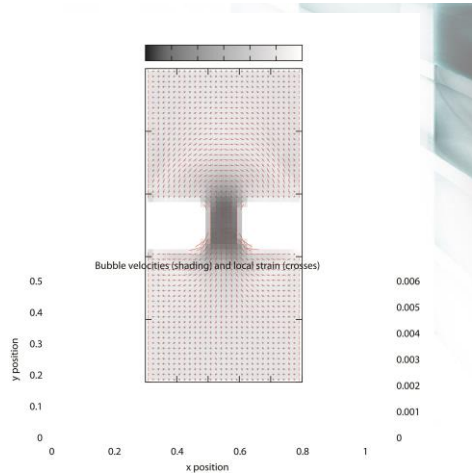


Scientific Visualization and Information Visualization

- Data Visualization
  - 2D and 3D
  - Time-varying physical phenomena
- Helping scientists and practitioners
  - Insight into data
  - Motion with magnitude and direction
- Examination of particle paths in the flow of complex fluids with discrete local structure

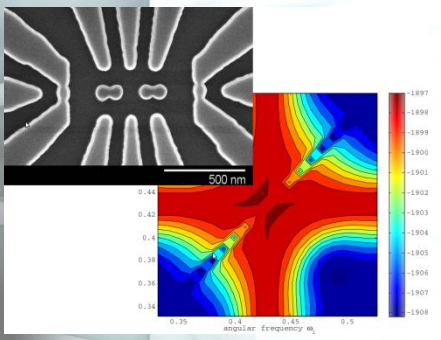




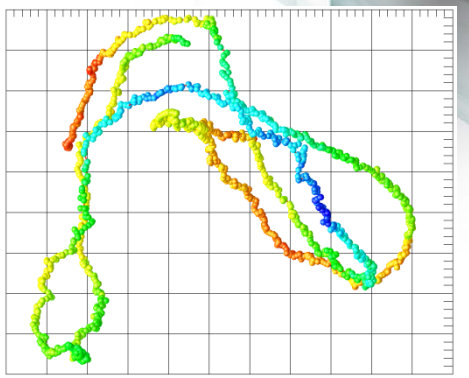


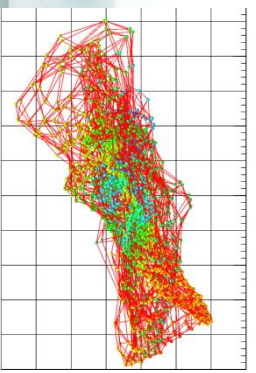
Scientific Foundation of Visual Computing Interfaces

- Point-based representation and processing
- Mesh-free simulation in GPUs
- Understanding and modelling relationships between changes in image acquisition and resulting images
- Applications in graphics, vision, robotics and VR



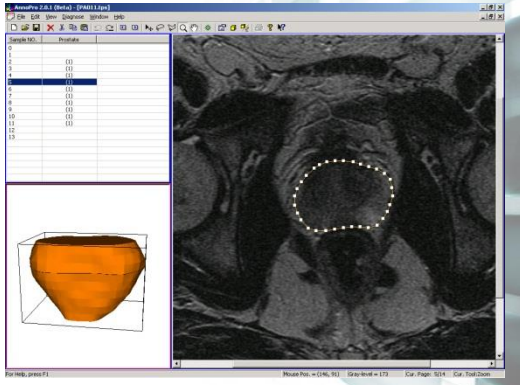
Hitachi Cambridge Labs and Cambridge University

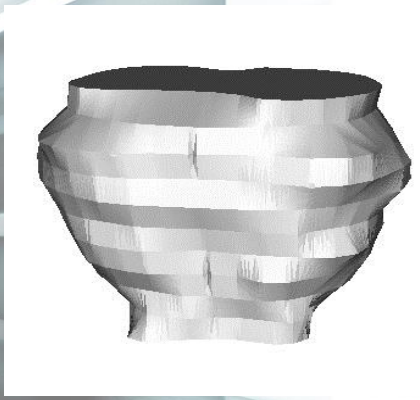


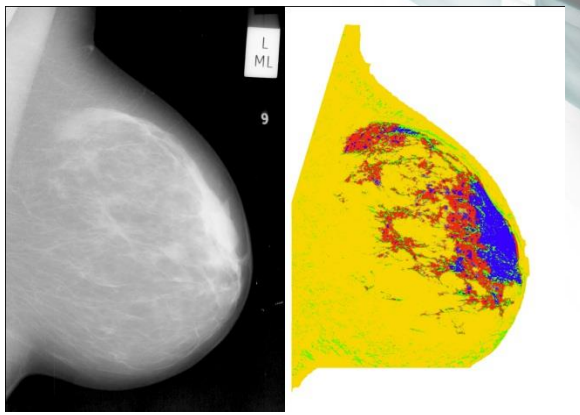


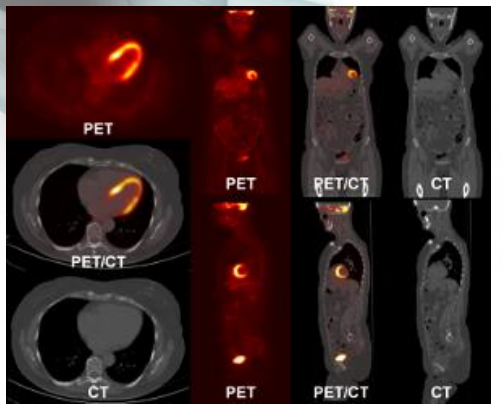
Medical Image Processing and Analysis

- Segmentation of volumetric data
- Estimation of volumetric changes over time
- Prostate/mammographic application areas
- Links to anatomical and functional data
- Tomography reconstruction and medical physics









Strategic Targets

Research Excellence

- 72 Publications
- £4.5m additional research income
- £1.2m additional 3rd Mission income

Research Capacity

- 28 Core RIVIC scientists
- 28 Research officers
- 36 Research students

RIVIC Achievements to date

Research Excellence

416 total publications

£9.43m additional research income

£1.99m additional 3rd Mission income

Research Capacity

28 Core RIVIC Scientists

28 Research Officers

38 PhD Students