

# 2023/24 B.Sc CS FYP areas

## **Prof. Ing. Carl James Debono**

Areas of interest are as follows:

- Object detection and tracking
- Medical image / video processing
- Depth-based video processing

## **Prof. Johann Briffa**

Areas of interest are as follows:

- GPU computing / high-performance computing
- Image & signal processing
- Error control coding

Current project topics to include:

- Quantum communications - particularly quantum key distribution
- Light field capture and processing
- Satellite image analysis
- Optimisation of drone flight paths for acquisition of 3D terrain imagery

## **Dr Ing. Trevor Spiteri**

Areas of interest are as follows:

Digital signal processing

- Digital signals include audio, video, etc.
- Processing them involves analysing, filtering, etc.
- Requirements:
  - Mathematical background
  - Some programming (C, Python, or other, depending on the project)

Embedded systems

- Have tight constraints, such as small memory, microcontrollers, etc.
- Can also be used for Internet of Things (IoT) devices

### **Prof. Adrian Francalanza**

Areas of interest are as follows:

- Concurrency and Distribution
- Programming Language Design and Implementation
- Static and Runtime Verification

### **Prof. Joshua Ellul**

Areas of interest are as follows:

- Blockchain
- Cryptocurrencies
- Smart Contracts
- Virtual Machines

### **Dr Mark Micallef**

Areas of interest are as follows:

- Software Engineering
- Test Automation

Sample Project Titles:

Automated Test Case Generation using Machine Learning Techniques

Identifying knowledge risks in software engineering through automated analysis of human interactions

### **Dr Sandro Spina & Dr Keith Bugeja**

Areas of interest are as follows:

Offline and Real-time Rendering

- Parallel and distributed rendering algorithms for physically-based visualisation
- Psychometric modelling for rendering optimisations
- Immersive virtual reality environment creation and visualisation (including material modelling and rendering, PCG and HCI)
- Denoising and upscaling of rendering output for scenes with glossy and specular surfaces
- Accelerated hybrid rendering (rasterisation-ray tracing) pipelines

Serious Games / Video Games

- Asset, world and environment procedural generation (e.g. clothing, city-scapes, levels)
- Creation of emerging behaviour in gameplay elements, e.g.:
  - solving problems in ways the developer did not envisage
  - interaction of systems to create credible but interesting/surprising outcomes