2026/27 B.Sc. CS Final Year Project areas

Prof. Johann A Briffa

Areas of interest are as follows:

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

Projects include: Current, (Recently Completed), Co-Investigator*

- Quantum communications / Quantum Key Distribution [GRYFFIN-Q / QUARTHIC / SQUIRE / ATTESTER* / ANQUOR / PRISM / QSNP / (QUDICE) / (QUANGO)]
- Light field capture and processing [VOLARE2 / (VOLARE)]
- Satellite image analysis [ADVISER / RBMP]
- Drone missions for acquisition of large-scale 3D assets

Possible titles: (to be discussed with me first; in some cases RSA contract can be set up)

- Implementation of a QKD protocol on an optical lab setup
- Simulator component for QKD end-to-end link
- Architectural review and improvement of a distributed Monte Carlo simulator
- Review and optimisation of an automated processing pipeline for satellite image analysis
- Mobile application for DJI drone automated flight control
- Blender plugins for drone flight path planning
- High precision camera distortion correction

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

Dr Inġ Etienne-Victor Depasquale

Areas of interest are:

- Reliable wireless routing for microcontroller-based devices
- Improvement of extant software power meters for multi-tenant power attribution
- Development of Segment Routing to carry Green Attributes

Projects include: Current, (Recently Completed)

- SMARTEN6G (contributor)
- TEKAID6G (Package Leader)

Sample Project Titles:

- Improvement of Scaphandre (software power meter) in conjunction with principal contributors (Hubblo)
- Comparative Analysis of extant wireless routing protocols
- Comparative Analysis of Scaphandre and PowerTOP: Accuracy Assessment Under Diverse System Loads.
- Green Policies for Segment Routing over Multiprotocol Label Switching

Prof. Adrian Muscat

Areas of interest are as follows:

- Neuro-Symbolic methods in Machine Learning
- Learning structure in probabilistic graphical models
- Joint vision and language models
- Computer Vision
- Applications of Machine Learning algorithms

Prof. Ing. Saviour Zammit

Areas of interest are as follows:

- Integrated Communications and Entertainment (ICE) systems with AI/ML-based Human Computer Interface (HCI) e.g. User-friendly ICE for the elderly
- AI/ML for communication systems for 5G and 6G
- Low-latency, robust, multimedia (especially video) communications
- UAV/IoT communications

Current Projects:

- Digital Twins for NTN 5G/6G Communications
- AI/ML applications for Communications
- Video capture and inference from UAVs
- V2X communications in 5G/B5G/6G

Prof. Ing. Carl James Debono

Areas of interest are as follows:

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

Prof. Christian Colombo

Areas of interest are as follows:

- Runtime verification (e.g. robotics, financial systems, communication protocols, IoT)
- Cyber security considerations for a runtime verification deployment
- Machine learning for cyber security

Sample Project Titles:

- Runtime verification of robotic systems running on ROS2
- Securing the X3DH Protocol through RV-TEE
- Machine learning techniques for network intrusion detection
- An IoT case study for RVsec
- Extending RVsec with performance and security properties

Dr Neville Grech

Areas of interest are as follows:

- Program Analysis
- Blockchain and smart contracts
- Security and privacy

Prof. Kevin Vella

Areas of interest are as follows:

- Practical concurrent systems
- Distributed computing in practice
- High performance computing
- Software tools and compilers for programming languages

Prof. Adrian Francalanza

Areas of interest are as follows:

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

Prof. Mark Micallef

Areas of interest are as follows:

- Agentic Software Engineering
    - The transformation of software development when AI agents act as collaborators in the engineering process.

- AI-Augmented Testing & Quality Engineering
    - Redefining verification, validation, and test strategy in environments where code and tests may be AI-generated.

- Software Delivery Systems in Autonomous Environments
    - Continuous Integration and Continuous Delivery when both humans and AI agents contribute to the codebase.

Sample Project Titles:

- Autonomous Test Suite Evolution: Can an LLM-Based Agent Maintain and Adapt Tests as Source Code Changes?
- Multi-Agent Code Review: Building and Evaluating a System Where Specialised Agents Collaborate to Find Defects
- Multi-Agent Automated Exploratory Testing using James Whittaker's City Tour Metaphor
- Agent-in-the-Loop CI/CD: Designing a Pipeline Where an Autonomous Agent Triages Failures and Proposes Fixes
- How Good Is the Test Code? Evaluating an Agentic Approach to Test Quality Assessment and Improvement

Prof. Gordon J Pace

Areas of interest are as follows:

- Software verification
- Domain specific language design and implementation
- Formal reasoning about contracts
- Runtime verification

Prof. Joshua Ellul

Area of interest are as follows:

- Blockchain
- Smart Contracts
- Cryptocurrencies
- Virtual Machines

Dr Sandro Spina

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

Prof. Mark Vella

Area of interest is as follows:

- Predictive methods for cloud-native computing

Sample Project Titles:

- A time series-based approach to elastic kubernetes scaling
- AI-Driven Kubernetes Optimization: Using Supervised Learning to Forecast Kubernetes Metrics
- Resource prediction model based on Kubernetes container auto-scaling technology
- Comparing gradient boosting machines to statistical learning methods for cloud-native telemetry prediction
- Comparing LSTM to statistical learning methods for cloud-native telemetry prediction
- Exploring transformer-based models for cloud-native telemetry prediction
- Health prediction of Kubernetes nodes using time-series forecasting
- Service-failure prediction using rule-based Kubernetes operators
- Anomaly detection in Kubernetes clusters