

Departmental Annual Report

Department of Computer Science

Faculty of ICT

30 September 2022

This report covers activities carried by academic staff members affiliated within the Department of Computer Science pertaining to Teaching, Research and Outreach Activities.

Time Period: 1 October 2021 – 30 September 2022

Section 1: Summary of Entity Profile

The Department of Computer Science has the distinctive mission of providing high quality teaching and research in foundational ICT topics, which students can then leverage to take up real-world challenges or specialise in any other subfield of ICT.

The Department is governed by the Faculty Board within the Faculty of ICT.

The Department's output this year has been as follows:

1. We have continued to produce high quality research papers with a number of books, book chapters and papers published in international peer-reviewed venues.
2. We have been working with stakeholders from within the University, industry and regulatory bodies to design and set up a new M.Sc. specialised in Cybersecurity. The degree, currently in Stage 2 approval form, will commence in October 2023 and has attracted industry support in terms of financial sponsorship, willingness to offer internship and commitment to design and deliver parts of the content.
3. We continue to attract substantial project funding with departmental staff currently involved in externally funded projects worth hundreds of thousands of euros.
4. We continue to offer a Tech Unit stream within the PLAS programme of the University.
5. We continue to offer high quality teaching across the Faculty of ICT's degrees as required.

Upcoming initiatives and developments for the year ahead

1. The launching of the new M.Sc. Cybersecurity degree as discussed above.
2. The approval of the University of Malta as a recognised examination centre for Cybersecurity certifications offered internationally by the EC Council.
3. The provision of Cybersecurity certification courses under the degree plus programme.

4. Setting up of a new conversion M.Sc. to help graduates from other fields to transition to ICT.
5. We are in advanced discussions, along with other University stakeholders, with ST Microelectronics to participate in a substantial funded project focusing on the safe co-work between humans and robots.

Noteworthy Points

- Prof. Adrian Francalanza promoted to Professor
- Prof. Joshua Ellul promoted to Associate Professor
- Dr Neville Grech has taken long leave (2 years) to focus on a startup opportunity
- Ms Gianuaria Crugliano has been engaged as Departmental Admin and subsequently promoted to Administrator II since Mr Kevin Cortis transferred to the SIMS office.
- Prof. Gordon Pace will be on sabbatical during this academic year

Section 2: Staff Profile

During 2021/2022, the department comprised of 10 resident academics, one of whom was on sabbatical. We also incorporated 1 affiliate lecturer from the Institute of Space Sciences and Astronomy; and a visiting part-time lecturer to provide sabbatical cover.

To incorporate:

- Any additional relevant outputs, such as: presentation of papers at conferences; engagement in externally or internally funded projects; involvement in community initiatives; and advisory or consultancy services to public or private entities related to their university work.

Full-time Resident Academics:

Dr Mark Micallef (Head of Department)
Prof. Gordon Pace
Prof. Adrian Francalanza (On Sabbatical)
Prof. Kevin Vella
Prof. Joshua Ellul
Dr Mark Vella
Dr Christian Colombo
Dr Sandro Spina
Dr Keith Bugeja
Dr Neville Grech

Affiliate Lecturers

Dr Alessio Magro

Visiting Part-time Academics:
Dr Ingram Bondin

Research Support Officers
Ms Jennifer Bellizzi
Ms Caroline Caruana

Section 3: Learning & Teaching Programme Profile

The Department services the following degree programmes:

- B.Sc. (Hons) Computing Science
- B.Sc. (Hons) Joint Degree (Faculty of Science)
- B.Sc. (Hons) ICT (Software Development)
- B.Sc. (Hons) ICT (Artificial Intelligence)
- B.Sc. (Hons) ICT (Computing and Business)
- B.Sc. (Hons) Computer Engineering
- M.Sc. Computer Science
- M.Sc. Digital Games

Of these, the Department is involved in the management of B.Sc. (Hons) Computing Science, the Joint Degree with the Faculty of Science and the M.Sc. Computer Science. The latter currently only has one student since the course has been paused while the department shifts its postgraduate strategy towards more specific M.Sc. programmes such as the upcoming M.Sc. Cyber security.

FYP Titles for 2021/22

- Using Monitoring-Oriented Techniques to Model the Spread of Disease
- JavaScript Framework for Actor-Based Programming
- Using Runtime Verification to generate intrusion timelines from memory images
- Convolutional Neural Network for Ingredient Detection
- Investigating the use of Machine Learning for Automated Element Location in Test Automation
- A fast approximate light transport method for ray tracing
- Investigating Issues with Computing and Interpreting the Truck Factor Metric
- Program Analysis: Towards the Analysis of CPython Bytecode
- Smart Contract Proxy Analysis
- A study on the prediction of cryptocurrency price trend using K-means Clustering and KNN Classification

APT Titles submitted in 2021/22

- Exploring Timed Deontic Modalities
- Lambda Calculus Evaluator
- Random Boolean Satisfiability

M.Sc. Dissertation Titles submitted in 2021/22

- Using Runtime Verification for Trustworthy Secure Shell Deployment
- Investigating the application of Imitation Learning in Automated Software Testing
- On Extending and Verifying the Raft Consensus Algorithm
- Static Checking of Concurrent Programs in Elixir Using Session Types

Section 4: Achievements Profile

Research Achievements

Publications in Journals, Books and Book Chapters

1. Runtime Verification: A Hands-On Approach in Java, **Christian Colombo** and **Gordon J. Pace**, Springer, ISBN 978-3-031-09266-4, 2022.
2. Jacques Vella Critien, Albert Gatt, and **Joshua Ellul**. Bitcoin price change and trend prediction through twitter sentiment and data volume, In Financial Innovation, Volume 8. Springer. May 2022.
3. Simon Joseph Aquilina, Fran Casino, **Mark Vella**, **Joshua Ellul** and Constantinos Patsakis. EtherClue: Digital investigation of attacks on Ethereum smart contracts, in Blockchain: Research and Applications, Volume 2, Issue 4. Elsevier. December 2021.
4. **Jennifer Bellizzi**, **Mark Vella**, **Christian Colombo**, Julio César Hernández Castro. Responding to Targeted Stealthy Attacks on Android Using Timely-Captured Memory Dumps. IEEE Access 10: 35172-35218 (2022).
5. **Axel Curmi**, **Christian Colombo**, **Mark Vella**. RV-TEE-Based Trustworthy Secure Shell Deployment: An Empirical Evaluation. J. Object Technol. 21(2): 2:1-15 (2022).
6. **Yonas Leguesse**, **Christian Colombo**, **Mark Vella**, Julio C. Hernandez-Castro. PoPL: Proof-of-Presence and Locality, or How to Secure Financial Transactions on Your Smartphone. IEEE Access 9: 168600-168612 (2021).
7. Martin Leucker, **Christian Colombo**. (As Editors). Int. J. Softw. Tools Technol. Transf. 23(2): 155-156 (2021).
8. **Neville Grech**, Sifis Lagouvardos, Ilias Tsatiris, Yannis Smaragdakis. Elipmoc: advanced decompilation of Ethereum smart contracts
9. Proceedings of the ACM on Programming Languages 6 (OOPSLA1), 1-27 2022
10. Yannis Smaragdakis, **Neville Grech**, S Lagouvardos, K Triantafyllou, I Tsatiris Symbolic value-flow static analysis: deep, precise, complete modeling of Ethereum smart contracts. Proc. ACM Program. Lang. 5 (OOPSLA), 1-30
11. **Adrian Francalanza**: A Theory of Monitors. Inf. Comput. 281: 104704 (2021)

12. **Adrian Francalanza**, Clare Cini: Computer says no: Verdict explainability for runtime monitors using a local proof system. *J. Log. Algebraic Methods Program.* 119: 100636 (2021)
13. Luca Aceto, Antonis Achilleos, **Adrian Francalanza**, Anna Ingólfssdóttir, Karoliina Lehtinen: An operational guide to monitorability with applications to regular properties. *Softw. Syst. Model.* 20(2): 335-361 (2021)
14. Luca Aceto, Ian Cassar, **Adrian Francalanza**, Anna Ingólfssdóttir: Comparing controlled system synthesis and suppression enforcement. *Int. J. Softw. Tools Technol. Transf.* 23(4): 601-614 (2021)
15. Davide Ancona, **Adrian Francalanza**. (As Editors) *J. Object Technol.* 21(2) (2022)
16. Christian Bartolo Burlò, **Adrian Francalanza**, Alceste Scalas, Catia Trubiani, Emilio Tuosto. PSTMonitor: Monitor synthesis from probabilistic session types. *Science of Computer Programming*, 2022, Article 102847 (to appear).

Publications in Conferences and Workshops

17. Camilleri, D., Porter, C., & **Micallef, M.** Investigating Cognitive Workload during Comprehension and Application Tasks in Software Testing, International Conference on Software Engineering and Knowledge Engineering, 2022
18. Camilleri, D., **Micallef, M.**, & Porter, C.. Assessing Task Difficulty in Software Testing using Biometric Measures, International BCS Human-Computer Interaction Conference, 2022
19. Gatt, C., Bugeja M., & **Micallef, M.** Towards Domain-Specific Automated Testing via Behavioural Cloning.
20. **Joshua Ellul**, and **Gordon J. Pace**. Verifiable External Blockchain Calls: Towards Removing Oracle Input Intermediaries, In 6th International Workshop on Cryptocurrencies and Blockchain Technology - CBT 2022, September 2022.
21. Shaun Azzopardi, **Joshua Ellul**, Ryan Falzon and **Gordon J. Pace**. Tainting in Smart Contracts: Combining Static and Runtime Verification, In the 22st International Conference on Runtime Verification, September 2022.
22. Shaun Azzopardi, **Joshua Ellul**, Ryan Falzon and **Gordon J. Pace**. AspectSol: A Solidity Aspect-Oriented Programming Tool with Applications in Runtime Verification, In the 22st International Conference on Runtime Verification, September 2022.
23. Simona Ramos, Lela Melon, **Joshua Ellul**. Exploring Blockchains Cyber Security Techno- Regulatory Gap: An Application to Crypto-Asset Regulation in the EU, In SciencesPo Law & Technology Conference in Paris., June 2022.
24. **Joshua Ellul** and **Gordon J. Pace**. SoliNomic: A Self-modifying Smart Contract Game Exploring Reflexivity in Law, In Disruptive Technologies in Media, Arts and Design, Lecture Notes in Networks and Systems Volume 382. Springer, Cham. January 2022.
25. Selective Presumed Benevolence in Multi-Party System Verification, Wolfgang Ahrendt and **Gordon J. Pace**, in Specify This – Bridging gaps between program specification paradigms, ISoLA2022, 2022.
26. Runtime Verification: Passing on the Baton, **Christian Colombo**, **Gordon J. Pace** and Gerardo Schneider, in Formal Methods in Outer Space Essays Dedicated to Klaus Havelund on the Occasion of His 65th Birthday: Essays Dedicated to Klaus Havelund on the Occasion of His 65th Birthday, 2021.

27. **Mark Vella, Christian Colombo.** D-Cloud-Collector: Admissible Forensic Evidence from Mobile Cloud Storage. SEC 2022: 161-178
28. **Axel Curmi, Christian Colombo, Mark Vella.** Runtime verification for trustworthy secure shell deployment. VORTEX@ISSTA 2021: 30-34.
29. **Jennifer Bellizzi, Mark Vella, Christian Colombo,** Julio C. Hernandez-Castro. Responding to Living-Off-the-Land Tactics using Just-In-Time Memory Forensics (JIT-MF) for Android. SECRYPT 2021: 356-369.
30. **Robert Abela, Christian Colombo,** Peter Malo, Peter Sýs, Tomás Fabsic, Ondrej Gallo, Viliam Hromada, **Mark Vella.** Secure Implementation of a Quantum-Future GAKE Protocol. STM 2021: 103-121.
31. Napoli K., **Bugeja K., Spina S.,** Magro M. and De Barro A. Anvil: A Tool for Visual Debugging of Rendering Pipelines. In Proceedings of the 17th International Joint Conference on Computer Vision, Imaging and Computer Graphics Theory and Applications - Volume 1: GRAPP 2022
32. De Barro, A.; **Bugeja, K.; Spina, S.;** Magro, M. and Napoli, K. A Lightweight Photon Tracing Method for Visualising Caustics. In Proceedings of the 17th International Joint Conference on Computer Vision, Imaging and Computer Graphics Theory and Applications - GRAPP 2022
33. Antonis Achilleos, Léo Exibard, **Adrian Francalanza,** Karoliina Lehtinen, Jasmine Xuereb: A Synthesis Tool for Optimal Monitors in a Branching-Time Setting. COORDINATION 2022: 181-199
34. Luca Aceto, Antonis Achilleos, Duncan Paul Attard, Léo Exibard, **Adrian Francalanza,** Anna Ingólfssdóttir: A Monitoring Tool for Linear-Time μ HML. COORDINATION 2022: 200-219
35. Luca Aceto, Antonis Achilleos, Elli Anastasiadi, **Adrian Francalanza:** Monitoring Hyperproperties with Circuits. FORTE 2022: 1-10
36. Luca Aceto, Antonis Achilleos, Elli Anastasiadi, **Adrian Francalanza,** Anna Ingólfssdóttir: Complexity through Translations for Modal Logic with Recursion. Proceedings 13th International Symposium on Games, Automata, Logics and Formal Verification (GandALF 2022), pp 34-49.
37. Gerard Tabone and **Adrian Francalanza:** Session Fidelity for ElixirST: A Session-Based Type System for Elixir Modules. Proceedings 15th Interaction and Concurrency Experience (ICE 2022), pp. 17-37.

Programme Committees

1. Joshua Ellul
 - a. Reviewer - Elsevier Journal on Blockchain: Research and Applications
 - b. Reviewer - Transactions on Dependable and Secure Computing
 - c. Program Committee - 6th International Workshop on Cryptocurrencies and Blockchain Technology - CBT 2022
 - d. Reviewer - Springer Nature Discover Education
 - e. Reviewer - IEEE Communications Magazine
 - f. Reviewer - IEEE Systems, Man, and Cybernetics Magazine
 - g. Reviewer - Springer Nature Discover Artificial Intelligence
 - h. Program Committee - IEEE DAPPS 2022
 - i. Technical Program Committee - 4th Conference on Blockchain Research & Applications for Innovative Networks and Services (BRAINS 2022)

- j. Technical Program Committee - International Congress on Blockchain and Applications (BLOCKCHAIN'22)
 - k. Reviewer - Elsevier Information and Software Technology
 - l. Reviewer - Elsevier SoftwareX
 - m. Reviewer - Springer Nature Scientific Reports
 - n. Reviewer - International Conference on Runtime Verification
2. Gordon Pace
 - a. JURIX 2022
 - b. RV 2022
 - c. SEFM 2022
 - d. SEFM 2021
 3. Christian Colombo
 - a. SAC-SVT 2022
 - b. Journal of Software and Systems Modeling
 4. Neville Grech
 - a. OOPSLA 2022
 - b. PLDI 2022
 - c. ISSTA 2022
 5. Sandro Spina
 - a. Reviewer - Springer Journal of Supercomputing (SUPE)
 6. Keith Bugeja
 - a. Reviewer - EG2022
 7. Adrian Francalanza
 - a. Program Chair - VORTEX 22
 - b. Program Committee - FORTE 22
 - c. Program Committee - COORDINATION 22
 - d. Program Committee - GandALF 22
 - e. Program Committee - RV 22
 - f. Program Committee - FTSCS 22
 - g. Reviewer - Journal of Formal Methods in System Design
 - h. Reviewer - Journal of Logical Methods in Computer Science
 - i. Reviewer - Acta Informatica Journal
 - j. Reviewer - Distributed Computing Journal
 - k. Reviewer - Science of Computer Programming Journal
 - l. Reviewer - Journal of Logical and Algebraic Methods in Programming
 - m. Reviewer - ICALP 22

Conferences and Meetings Attended

1. Mark Micallef
 - a. International BCS Human-Computer Interaction Conference, 11th - 13th July 2022
2. Joshua Ellul

- a. 6th International Workshop on Cryptocurrencies and Blockchain Technology - CBT 2022, September 2022.
3. Gordon Pace
 - a. SEFM 2022
 - b. Legal Developments in FinTech: Now and Beyond, 2022.
4. Christian Colombo
 - a. ISOLA 2021
 - b. IFIPSEC 2022
5. Neville Grech
 - a. OOPSLA 2021
 - b. PLDI 2022
 - c. ISSTA 2022
6. Mark Vella
 - a. IFIPSEC 2022
7. Keith Bugeja
 - a. EGSR 2022
8. Adrian Francalanza
 - a. FORTE 2022
 - b. COORDINATION 2022
 - c. ICE 2022

List of Funded Projects

Project: Knowledge Fabric

Staff Members: Mark Micallef

Funded through: TOSFA Grant

Value: €10,000

Time Frame: 2 years

Scope: The project involves the development of a commercial prototype of a tool based on University research. The tool in question plugs into popular continuous integration platforms, analyses human interaction with software development tools and provides insights into knowledge risks that an organisation might be exposed to.

Project: Investigating the use of machine learning in software test generation

Staff Members: Mark Micallef

Funded through: Internal Research Grant

Value: €2,500

Time Frame: 1 years

Scope: The project focused on leveraging imitation learning techniques from the field of artificial intelligence to automatically generate exploratory test sequences for previously unseen e-commerce systems. The project produced one publication so far with another one being prepared.

Project: Smart Contract Taint Analysis

Staff Members: Gordon Pace

Funded through: Internal Research Grant

Value: €2,500

Time Frame: 1 years

Scope: Blockchains enable trustless processing of data and execution of smart contracts which regulate the behaviour between parties. However, in real-world scenarios, information and data from the outside world must be provided by individual parties or devices, typically called oracles, which introduce points-of-trust. The effects and outputs of smart contracts may thus not be as trustless as one would want, and it is crucial to know which parties can unilaterally influence the effect of such execution. In this project, we propose to adopt techniques used in security and information flow analysis to be able to analyse smart contracts and deduce dependencies between the parties and the algorithm data, control and resource flows.

Project: VINOVeritas

Staff Members: Joshua Ellul and Gordon Pace

Funded through: European Agricultural Fund for Rural Development

Value: €192,924

Time Frame: 3 years

Project: Secure Communication in the Quantum Era (G5448) (2018-2022),

Staff Members: Christian Colombo and Mark Vella

Funded through: NATO, Science for Peace and Security Programme.

Value: 264,000

Time Frame: 3 years

Project: LOCARD (2018-2022),

Staff Members: Mark Vella and Christian Colombo

Funded through: H2020 RIA

Value: 261,210

Time Frame: 3 years

Scope: LOCARD aims to provide a holistic platform for chain of custody assurance along the forensic workflow, a trusted distributed platform allowing the storage of digital evidence metadata in a blockchain. An investigator toolkit included novel collection techniques complements the platform.

Project: DETECTIF (2022-2023),

Staff Members: Mark Vella and Christian Colombo

Funded through: Fusion R&I REP

Value: 50,000

Time Frame: 1 year

Scope: The overarching aim of the DETECTIF is to improve on state-of-the-art mobile forensics when dealing with cybercrime incidents involving Android malware employed for financial theft and the compromise of personal safety. We intend to evolve a novel technique - Just-In-Time Memory Forensics (JIT-MF) to attain this aim by exposing otherwise non-available evidence.

Project: CyberForensics (2022),

Staff Members: Mark Vella

Funded through: Internal Research Grant

Value: 2,500

Time Frame: 1 year

Scope: Ongoing research leverages the core idea that in-memory artefacts cannot be avoided by cyberattacks in order to provide more effective digital investigation tools for incident responders during the collection, analysis and recovery stages.

Project: BehAPI (2018-2024)

Staff Members: Adrian Francalanza

Funded through: H2020 RISE

Value: €675,000

Time Frame: 5 years

Scope: The project brings together a consortium of 20 sites to bridge the gap between behavioural types on the academic side and API-based software technologies from the industrial side.

Project: MoVeMnt (2021-2023)

Staff Members: Adrian Francalanza

Funded through: RANNIS

Value: €300,000

Time Frame: 3 years

Scope: The project explores further the foundations of runtime verification and enforcement. It examines the monitorability of hyperproperties and distributed verification, studies the decidability and complexity of property monitorability, and compares monitorability with other important and related techniques, such as learning and diagnosability.

Project: Security Behavioural APIs (2022),

Staff Members: Adrian Francalanza

Funded through: Internal Research Grant

Value: €2,500

Time Frame: 1 year

Scope: APIs (Application Programming Interfaces), have disrupted how software is developed, where the software "glue" has become as important as its internal working. This project develops technologies that augment APIs to assist secure software construction and make them more resilient to security attacks via techniques such as static typechecking and runtime monitoring.

Project: Hyben - Hybrid Verification of Heterogeneous Message-Passing Applications (2022-2026)

Staff Members: Adrian Francalanza

Funded through: Independent Research Fund Denmark

Value: €210,000

Time Frame: 4 years

Scope: The project explores the application of static and dynamic verification techniques to verify heterogeneous message-passing programs. The setting requires the various verification techniques to cooperate across the pre- and post- deployment phases of software development.

Community Outreach

(here, list any activities related to community outreach such as science in the city, school visits, etc)

1. Joshua Ellul
 - a. 28th Septmeber 2022: Panelist on Into the Metaverse. as part of iGaming NEXT Valletta 22. **Joshua Ellul**
 - b. 8th July 2022: Panelist in EU Blockchain Observatory and Forum's conference on Blockchain: a key enabler to innovation in Europe and the world. Ioannis Revolidis and **Joshua Ellul**
 - c. 29th June 2022: The Rule of Law and Blockchain in UNBLOCK: The Potential of Blockchain for Social Innovation. **Joshua Ellul** and Alex Grech
 - d. 23rd June 2022: Panelist on NFTs and Use-cases in the Creative Industry as part of The Creative Side of the Digital Economy organised by Tech.mt. **Joshua Ellul**
 - e. 23rd June 2022: A collaborative Innovative Technology Regulatory Framework as part of AI and ICT CETA talks. **Joshua Ellul**
 - f. 20th June 2022: Panelist on Integration of AI at the Workplace at the Future Skills & AI in Europe - TransFormWork Second European Round Table. **Joshua Ellul**
 - g. 17th June 2022: Online webinar: Multidisciplinary Metaverse Future: From Education, Research and Innovation to Regulation. Denisa Kera, Ioannis Revolidis and **Joshua Ellul**
 - h. 7th June 2022: Decentralisation vs Centralisation: How far should we go? at the Digital Nomad Meetup. **Joshua Ellul**
 - i. 25th May 2022: Panelist within the Future of Finance day as part of EmTech Investment Hub's conference in Davos 2022. **Joshua Ellul**
 - j. 13th May 2022: Keynote on Techno-regulatory frameworks for Blockchain and other emerging technologies as part of Warwick Legal Network's academic day conference. **Joshua Ellul**
 - k. 28th April 2022: Panel on NFTs & Metaverses vs Law with Prof. Francesco Di Ciommo, Prof. Andrea Stazi, Luigi Telesca; and chaired by Prof. Gustavo Olivieri, organised by Fabiana Di Porto at LUISS Data Lab. **Joshua Ellul**
 - l. 31st March 2022: Lessons so far from Technology Assurance Sandboxes within OpenLoop and Demos Helsinki's 2nd event on Where Experimentation meets Emerging Tech. **Joshua Ellul**
 - m. 30th March 2022: Regulating Emerging Technologies: Starting with Blockchain and AI at the IIoT & Smart Manufacturing Virtual Conference organised by the International Society of Automation. **Joshua Ellul**
 - n. 16th March 2022: Introductory Panel on Blockchain and the Metaverse as part of the Campus Tech Summit at the University of Malta. **Joshua Ellul**
 - o. 11th March 2022: Panel Member on INATBA's workshop on Can DeFi & DAOs continue to scale outside of regulatory perimeters? **Joshua Ellul**

- p. 10th March 2022: Smart Contracts: Where technology and law collide as part of the EU Blockchain Observatory & Forum's workshop on Smart Contracts. **Joshua Ellul**
 - q. 9th March 2022: AI R&I and Regulation. The context of global security and economic crises: The case of Malta. as part of the Digital International Forum's Innovation & Research in AI event organised by Smart Everywhere Everything. **Joshua Ellul**
 - r. 28th January 2022: Blockchain in Education. Organised by The Commonwealth Centre for Connected Learning (3CL). **Joshua Ellul** and Alex Grech
 - s. 27th January 2022: DLT in the Creative Industry. Organised by Malta Enterprise. **Joshua Ellul**
 - t. 21st January 2022: Cryptocurrencies: Debunking the Myths. Organised by The Commonwealth Centre for Connected Learning (3CL). **Joshua Ellul** and Alex Grech
 - u. 9th December 2021: Emerging challenges in the blockchain ecosystem - Experts roundtable as part of the B-hub for Europe: connecting blockchain innovation ecosystems. **Joshua Ellul**
 - v. 23rd November 2021: Blockchain, Smart Contracts and DLT as part of the MSc in Information Systems at the University of Groningen. **Joshua Ellul**
 - w. 17th November 2021: Keynote: De/centralisation, Un/certainty and De/regulation in the AI Blockchain Summit. **Joshua Ellul**
 - x. 16th November 2021: Panel: The Great Awakening: Let's Start the First Digital Nation State - Roundtable Discussion in the Affiliate Grand Slam Conference with Dr Max Ganado, Daniel Goebel and Timur Artemev. **Joshua Ellul**
 - y. 5th November 2021: AgriTech: Automating Agriculture - Some Challenges and Solutions Chamber of Engineers workshop on Engineering a Smarter Industry. **Joshua Ellul**
2. Christian Colombo
 - a. 3rd December 2021: Open letter: "STEM Thinking - The Way Forward"
 - b. 25th March 2022: SNC Mtarfa Teen Science Cafe
 - c. 21st January 2022: Focus Group with Primary Science Team (organised by TECH.MT)
 - d. 4th February 2022: Focus Group with Primary Science Team (organised by TECH.MT)
 - e. 7th March 2022: tiny Teen Science Café session at Dingli Primary
 - f. 1st July 2022: Marketing video for FICT Exhibition 2022
 - g. 18 July 2022: Lounge Around Event
 - h. Publicising PLAS Tech Units
 - i. Publicising Masters in CyberSec
 3. Mark Vella
 - a. 23rd September: CyberSecurity Workshop
 - b. 30th September: Science in the City
 4. Sandro Spina
 - a. Publicising PLAS Tech units on CampusFM
 - b. Radio Mocha interview on Computer Graphics

1. Mark Micallef
 - a. Head of Department
 - b. Faculty Board (ICT)
 - c. Heads of Department sub-committee
 - d. Faculty Admissions Committee
 - e. Chair, Board of Studies - B.Sc. (Hons) Computing Science
2. Christian Colombo
 - a. FICT Outreach Committee
3. Neville Grech
 - a. Faculty Doctoral Committee
 - b. Matsec Chairman (Computing)
4. Mark Vella
 - a. Faculty Board (ICT)
 - b. AQPRU stages 1 and 2 of new MSc in CyberSecurity
 - c. Setting up of an Academia Partner Program with EC-council
5. Sandro Spina
 - a. Chair, Faculty Research Ethics Committee ICT
 - b. Coordinator of PLAS Tech Units
 - c. Member, Board of Studies - Research MSc ICT
 - d. Member, Board of Studies - Computer Science MSc
6. Keith Bugeja
 - a. Advisory Committee for Research
 - b. Member, Board of Studies - Data Science MSc
 - c. Member, Board of the Particle Detector and Accelerator Platform (PDAP)

Section 5: Governance Profile

Committee meetings for which minutes are placed in the UM repository that are attended by the Department are as follows:

- Faculty Board - Faculty of ICT
- Departmental Meetings - Department of Computer Science
- Board of Studies - B.Sc. (Hons) Computing Science
- Board of Studies - M.Sc. Computer Science
- Board of Studies - M.Sc. Data Science

Dr Mark Micallef
Head of Department, Department of Computer Science
30 September 2022