Cyprus University of Technology | Studies and Student Welfare Services

Doctoral Vacancy Announcement

Research Topic Title:

Intelligent Networks, Control over Networks, Intelligent Transportation Systems, Autonomous Vehicles, Connected and Automated Mobility, 6G Empowered Robotics, Marine Transport Electrification, Feedback based Molecular Communications.

No. of Openings: 1

Description:

We are seeking highly motivated and talented PhD candidates to join our research team at the Department of Electrical Engineering, and Computer Science and Engineering, Cyprus University of Technology. The successful candidates will engage in cutting-edge research within the field of **"Intelligent Networks: Control over Communication Networks"** with a focus on one the following areas:

- **Cooperative Control and Perception for Connected and Automated Mobility (CCAM**) in the presence of Reconfigurable Intelligent Surfaces (RIS). The project will investigate the design of novel **Adaptive Controllers** for connected and automated mobility when this is supported by the Collective Perception Service. Controller Design will involve leveraging classical control theory combined with **Advanced Artificial Intelligence Techniques** to account for the delays and inaccuracies emanating from the underlying vehicular network. Evaluation will be conducted using Matlab, the VEINS/PLEXE simulations platform as well as prototyping on an actual testbed. Extensions of the project results for **6G empowered Robotics** will be investigated.
- **Advanced Network Design** for Next Generation Communication Systems **and 6G Empowered Robotics**.
- **Energy Management and Control in Marine Transport Electrification.** The project will leverage a blockchain based energy trading platform under development to support On-Shore Ship Electrification. The port of Limassol will be used as the test case
- **Feedback in Molecular Communications.** The project will support our ongoing research activities on Molecular Communication leveraging a testbed, currently in development in collaboration with renowned Biologists at the University of Cyprus. Emerging applications such as Smart Pills, Targeted Drug Delivery and the Internet of Bio Things will be considered.

The selected candidates will have the opportunity to collaborate, within funded research projects, with esteemed researchers at the International level and upon availability it may involve mobility to Partner Institutions in Europe.

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Required Qualifications:

- A Bachelor's or Master's degree from a recognized university in Electrical Engineering or Computer Engineering or Computer Science.
- Strong background on Control/Communications Systems.
- Programming experience in high-level programming languages.
- Excellent communication skills in English (written and spoken).
- Self-motivation, teamwork skills, and a commitment to high-quality research.
- Familiarity with Intelligent Transportation Systems/Molecular Communications/Power Systems will be an advantage.

Funding:

Financial support opportunities, particularly for exceptional candidates, exist through contributions to the deliverables of a number of currently funded projects from the Research and Innovation Foundation (RIF) as well as deliverables of the advisor's starting grant, and involvement in teaching activities. Indicative financial support at the time of writing this announcement is 18,000€ per annum for approximately three years.

Research Advisor:

Name/Surname: Dr Marios Lestas
Position: Assistant Professor
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Doctoral Vacancy Announcement form

Research Topic Title: Understanding Security and Trust in Intelligent and Generative AI Agents on the Modern Web

No. of Openings: 1

Description:

As generative and reasoning-based AI systems become increasingly capable of browsing the web, retrieving information, and acting in online environments, a new digital layer is emerging, one in which autonomous or semi-autonomous intelligent agents interact with the web on behalf of users, organizations, or even other AI systems. These interactions introduce a plethora of new scientific, technical, and ethical questions with direct implications on security and privacy: How can we recognize, understand, and attribute the behavior of such intelligent agents? How do they perceive and interpret online content? Are they biased? And to what extent can their responses be influenced or controlled?

This PhD position aims to study the technical and behavioral dimensions of intelligent AI agents operating in web and networked environments, with emphasis on security, privacy, and trust. The candidate will investigate methods to detect, understand, characterize, and influence the actions of these systems through controlled experiments, large-scale measurements, behavioral analysis, simulation, and system prototyping. The research will also explore how such agents can be strengthened against bias and manipulation, and how they might collaborate or cross-validate one another's outputs to ensure reliability and correctness. Our goal is to advance understanding of this new agentic web layer and to develop the scientific foundations and practical mechanisms for observing, interpreting, defending, and governing intelligent agents in the modern web.

Possible research directions include:

- Developing techniques for identifying and fingerprinting AI-driven or AI-mediated activity across the web, and attributing it to specific models, frameworks, or behavioral profiles
- Analyzing how intelligent agents perceive, interpret, and reason about online content, and identifying biases or systematic errors that influence their actions and decisions.
- Investigating manipulation and influence vectors, examining how crafted content or adversarial context can alter or exploit agent behavior.

- Designing detection, mitigation, and hardening mechanisms to protect agents and online platforms from manipulation, data poisoning, or model exploitation.
- Exploring cooperative and cross-verification mechanisms among AI agents to improve accuracy, reliability, and resistance to deceptive stimuli.

Required Qualifications:

- Bachelor's (BSc) and Master's (MSc) degrees in Computer Science or a related field.
- Solid programming skills and hands-on experience with web technologies, scripting, or system automation.
- Strong background and/or interest in web security and generative AI systems.
- Familiarity with topics such as browser internals, software instrumentation, or adversarial machine learning, will be considered an advantage.
- Excellent analytical and problem-solving skills, and motivation to conduct high-quality, independent research.

Funding: Funding may be available for qualified candidates through participation in a research program and/or teaching assistant positions.

Contact: For more information and discussion on the research topic, potential candidates can contact directly:

Name/Surname: Dr. Panagiotis Ilia
Position: Lecturer
Email: panagiotis.ilia@cut.ac.cy

Cyprus University of Technology | Studies and Student Welfare Services

Doctoral Vacancy Announcement form

Research Topic Title: Advanced Static and Dynamic Analysis for Threat Detection and Controlled Execution on the Web.

No. of Openings: 1

Description:

Modern web applications form complex, rapidly evolving ecosystems that often rely on extensive client-side logic, dynamic content generation and inclusion, and third-party integrations. This complexity increases the likelihood of vulnerabilities, dependence on third-parties, inconsistent security boundaries, and hidden malicious behaviors that remain undetected by conventional approaches.

This PhD position focuses on advancing program analysis for the web, through complementary static and dynamic analysis techniques that enable deeper understanding of code behavior and execution flow. The research will explore advanced and hybrid analysis approaches that combine structural code understanding with runtime execution monitoring, aiming to maximize code coverage, detect and characterize evasive behaviors, and support automated discovery of security flaws. Artificial intelligence (such as generative and reasoning-based AI) may also be employed as an enabling component for automation, guided fuzzing, adaptive testing, or the synthesis of new analysis rules from prior knowledge and empirical data.

The candidate will apply the developed techniques to detect, analyze, and mitigate web-based security threats. This includes identifying malicious code injection, tracking data exfiltration paths, and understanding evasion or obfuscation strategies in client-side execution. The research will also explore mechanisms for fine-grained control and enforcement over web execution, enabling proactive and adaptive defenses.

Required Qualifications:

- Bachelor's (BSc) and Master's (MSc) degrees in Computer Science or a related field.
- Strong programming skills and hands-on experience in web technologies.
- Strong background and/or interest in software security, web security or program analysis.

- Familiarity with topics such as static or dynamic analysis, fuzzing, penetration testing, or code instrumentation will be considered an advantage.
- Excellent analytical and problem-solving skills, and motivation to conduct high-quality, independent research.

Funding: Funding may be available for qualified candidates through participation in a research program and/or teaching assistant positions.

Contact: For more information and discussion on the research topic, potential candidates can contact directly:

Name/Surname: Dr. Panagiotis Ilia
Position: Lecturer
Email: panagiotis.ilia@cut.ac.cy

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Doctoral Vacancy Announcement form

Research Topic Title: Hardware-Software Cooperation for a Sustainable Future of Computing

No. of Openings: 1

Description: Power-Performance efficiency is essential and needs to be improved in all its aspect if we want to aim for a sustainable future in computing, and that requires close cooperation between the software and the hardware. The successful candidate will have the chance to work on state-of-the-art hardware (e.g. the TT-QuietBox Wormhole) and explore innovative architectural techniques, energy-efficient computing paradigms, and intelligent workload optimizations to enhance the performance, scalability, and efficiency of next-generation computing systems and software. Research areas may include Hardware/Software Co-design for Energy Efficiency, Processor Optimizations, Heterogeneous Computing, Domain-Specific Accelerators (DSA), High-Performance Computing (HPC), Parallel Programming and Execution Models, and AI-driven optimization techniques for energy-efficient execution.

Required Qualifications: Undergraduate (BSc) degree in Computer Science, Computer Engineering or related field. A postgraduate (MSc) degree is preferred but not required. The ideal candidate should enjoy working on cutting-edge systems research problems and have good software development skills (C/C++, Python). Prior research experience or specialization in related topics will be considered an advantage.

Funding: There is possibility of funding for 3 years through involvement in a Research Program for qualified applicants and/or as teaching assistants.

Research Advisor:
Name/Surname: Andreas Diavastos
Position: Lecturer
Email: andreas.diavastos@cut.ac.cy

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Doctoral Vacancy Announcement form

Research Topic Title:
Advanced Power Semiconductor Devices and Power Electronic Systems for Renewable Energy, Electric Mobility, and Smart Grid Applications

No. of Openings: 1

Description:

We are seeking highly motivated and talented PhD candidates to join our research team at Cyprus University of Technology. The successful candidates will engage in cutting-edge research within the field of power semiconductor devices and power electronic systems, with a focus on the following areas:

- Wide-Bandgap (WBG) and Ultra-Wide Bandgap (UWBG) Semiconductor Technologies (SiC, GaN) for high-efficiency power conversion.
- Advanced TCAD Modelling and Simulation for the design and optimisation of semiconductor devices tailored for smart grids, renewable energy systems, electric vehicles, and next-generation power systems.
- Failure Mechanisms and Reliability Analysis of power electronic devices, with comparisons to IGBT technologies.
- Energy Storage and Battery Technologies, including degradation mechanisms, aging models, and condition monitoring.
- High-Efficiency Power Conversion Systems for renewable energy integration, electric vehicle powertrains, and grid-connected applications.
- Smart Grid Applications including AC/DC and DC/DC power conversion for distributed energy resources and microgrids.
- Electrified Mobility Solutions, focusing on powertrain efficiency, fast charging technologies, and electric vehicle infrastructure.

This research directly contributes to impactful advancements in:

- Renewable Energy Systems: High-efficiency power conversion for solar and wind energy integration.
- Electric Mobility: Powertrain optimisation and energy management for electric vehicles, including electric aircraft and maritime applications.
- Smart Grids and Energy Distribution: Enhancing grid stability and energy efficiency through advanced power electronics.
- Sustainable Power Systems: Contributing to zero-carbon emission solutions for future energy

systems.

The selected candidates will have the opportunity to collaborate within international research projects, including the FLAGCHIP Horizon Europe initiative, and contribute to impactful advancements in power electronics and energy systems. Financial support opportunities, particularly for exceptional candidates, exist through contributions to project deliverables or involvement in teaching activities. These opportunities can be discussed during the interview stage.

Required Qualifications:

- A Bachelor's and Master's degree in Electrical Engineering, Power Electronics, Semiconductor Physics, or related fields.
- Strong background in power semiconductor devices, power electronics, or energy systems.
- Proficiency in simulation tools such as Silvaco TCAD, LTSpice, or Matlab is highly desirable.
- Excellent communication skills in English (written and spoken).
- Self-motivation, teamwork skills, and a commitment to high-quality research.

Funding:

Financial support opportunities, particularly for exceptional candidates, exist through contributions to the deliverables of the funded research projects and involvement in teaching activities. Details can be discussed during the interview stage.

Research Advisor:

Name/Surname: Dr Neophytos Lophitis
Position: Assistant Professor of Electrical Energy Systems
Email: neophytos.lophitis@cut.ac.cy

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Doctoral Vacancy Announcement form

Research Topic Title: THEORETICAL AND EXPERIMENTAL INVESTIGATION OF GEOTHERMAL SYSTEMS

No. of Openings: 1

Description: Required a theoretical and experimental investigation of geothermal systems.

Required Qualifications: BSc and/or MSc in Electrical Engineering and Computer Engineering or Computer Science or Physics, or any other related subject. Strong mathematical modeling background will be considered an advantage.

Funding: None

Contact: For more information and discussion on the research topic, potential candidates can contact directly:

Name/Surname: Paul Christodoulides
Position: Asst. Professor
Email: paul.christodoulides@cut.ac.cy

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Doctoral Vacancy Announcement form

Research Topic Title: PRODUCTION OF HYDROGEN BY FREQUENCIES, HYDROLYSIS AND IMPURITIES OF MATERIALS. THEORETICAL AND EXPERIMENTAL APPROACH

No. of Openings: 1

Description: Required a theoretical and experimental approach for the production of hydrogen by frequencies, hydrolysis and impurities of materials.

Required Qualifications: BSc and/or MSc in Electrical Engineering and Computer Engineering or Computer Science or Physics, or any other related subject.

Funding: None

Contact: For more information and discussion on the research topic, potential candidates can contact directly:

Name/Surname: Paul Christodoulides
Position: Asst. Professor
Email: paul.christodoulides@cut.ac.cy

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Doctoral Vacancy Announcement form

Research Topic Title: ENABLING POWER SYSTEMS OF LOWER COSTS AND CARBON EMISSIONS THROUGH DECENTRALIZED ENERGY STORAGE MANAGEMENT, RENEWABLES AND DISPATCHABLE GENERATION. THE CASE OF CYPRUS FOR AN ISOLATED POWER SYSTEM

No. of Openings: 1

Description: Current power systems were designed many years ago, without provisions for integrating any non-dispatchable generation (e.g., Renewable Energy Sources) or handling bidirectional energy flows. Significant challenges that all Transmission and Distribution System Operators (TSOs and DSOs) need to address are congested assets such as power lines and transformers, system stability due to excess generation and low demand and optimum economic dispatch due to the stochastic nature of renewable generation. Such problems become even worse in isolated power systems where system weakness increase with the increase of RES and significant curtailments take place. Energy storage can be a solution, as it can absorb excess renewable generation and provide it when it is needed, resulting to a smoother power demand as seen by the dispatchable generators and hence, allowing a more efficient generation unit commitment and dispatch. Nevertheless, with centralized storage there is little or no benefit for grid congested substations and power lines, which face power flows close to their limits and in case of any faults or failures, significant distributed generation or load may be disconnected for system's stability reasons. Hence, allowing decentralized energy storage at different congested locations of the utility grid, allows an increased penetration of RES with a reduced curtailment. The main objective of the study is to examine the addition of decentralised storage at different strategic substations of the grid through energy management optimization of the storage to quantify the benefits of the system in terms of investment and running costs and RES integration gain.

Required Qualifications: BSc and/or MSc in Electrical Engineering and Computer Engineering or Computer Science or Physics, or any other related subject.

Funding: None

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Contact: For more information and discussion on the research topic, potential candidates can contact directly:

Name/Surname: Paul Christodoulides
Position: Asst. Professor
Email: paul.christodoulides@cut.ac.cy

Cyprus University of Technology | Studies and Student Welfare Services

Doctoral Vacancy Announcement form

Research Topic Title:
Monitoring and Self-Adaptation Capabilities for Uncertainty-Informed Resilient Cyber-Physical Systems

No. of Openings: 2

Description

Cyber-Physical Systems (CPS), including autonomous robots, unmanned aerial vehicles, and smart infrastructures, increasingly rely on artificial intelligence (AI) to make complex decisions in dynamic and uncertain environments. Despite their growing autonomy, such systems often face critical challenges related to uncertainty, adaptability, and reliability, especially when deployed in safety-critical contexts.

This PhD project aims to advance the foundations of uncertainty-aware monitoring and self-adaptation in autonomous and intelligent systems. The successful candidate will develop mathematically grounded and data-driven techniques to ensure the resilience, trustworthiness, and robustness of next-generation CPS operating in the presence of uncertainty.

Research Aims

The overarching goal of this project is to develop monitoring and self-adaptation capabilities that treat uncertainty as a first-class concern in the design and operation of autonomous systems. Specifically, the PhD researcher will:

- Conduct research on rigorous and mathematically based techniques for empowering monitoring and self-adaptation in autonomous systems, explicitly accounting for uncertainty.
- Develop learning-enabled monitors that can be revised and refined based on runtime data, improving the fidelity of system models and enabling robust self-adaptation.
- Design and implement techniques for uncertainty quantification of AI components used in robotic and CPS applications.
- Investigate approaches for managing uncertainty in AI-based decision-making, enabling effective and efficient risk-informed adaptation of the target systems.

Potential Research Themes

This project offers scope for research across several interrelated areas, including but not limited to:

- Formal and probabilistic verification for autonomous and adaptive systems under uncertainty.
- Stochastic and hybrid modeling techniques incorporating partial observability and non-determinism.
- Learning-based refinement of monitors and models from runtime and operational data.
- Uncertainty quantification for AI components in robotic and cyber-physical systems.
- Uncertainty-aware decision-making frameworks enabling reasoning about epistemic and aleatoric uncertainty.
- Development of software toolsets for uncertainty analysis, risk evaluation, and adaptive control in real-world CPS applications.

Expected Results

By the completion of the PhD, the candidate is expected to deliver:

- Novel techniques for monitoring and decision-making under uncertainty, integrating heterogeneous stochastic models that handle partial observability and non-determinism.
- Methods for learning and refinement of monitors that improve structural and behavioural representations based on operational data.
- A toolset for uncertainty analysis and quantification, adaptable to various operating contexts.
- Uncertainty-based decision-making techniques enabling principled reasoning about different forms of uncertainty.

Required Qualifications

- A Bachelor's and Master's degree in Computer Science, Electrical/Computer Engineering, Mathematics, or related fields.
- Strong background in Artificial Intelligence, Machine Learning, or Applied Mathematics.
- Experience with Deep Learning frameworks (e.g., PyTorch, TensorFlow) or formal verification tools is highly desirable.
- Demonstrated interest in autonomous systems, reliability, and safety-critical AI.
- Excellent communication skills in English (written and spoken).
- High degree of self-motivation, ability to work independently and collaboratively, and a commitment to high-quality research.

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Funding

Financial support opportunities, particularly for exceptional candidates, are available through:

- Contributions to the deliverables of the ASTIR Horizon Europe project,
- Deliverables associated with the advisor's starting grant, and
- Participation in teaching and departmental activities.
- Indicative financial support at the time of this announcement is approximately €13,000 per annum, plus €3,000 per annum for tuition fee support, for a duration of three years.

Research Advisor

Name: Dr Simos Gerasimou
Position: Assistant Professor
Email: simos.gerasimou@cut.ac.cy

Cyprus University of Technology | Studies and Student Welfare Services

Doctoral Vacancy Announcement form

Research Topic Title:
Intelligent and Adaptive Trustworthiness Assessment of AI

No. of Openings: 2

Description

Deep Learning (DL) has achieved unprecedented success in recent years, reaching—and in some cases surpassing—human-level performance across a range of challenging tasks. These breakthroughs have led to the widespread deployment of DL models in safety- and security-critical domains, including drug discovery, flight control systems, and autonomous driving.

However, despite these remarkable advances, significant challenges remain. Current DL systems often display unstable and unreliable behaviour when exposed to small perturbations in input data, and their performance can degrade sharply under data distribution shifts that differ from those encountered during training. These vulnerabilities raise major concerns regarding the robustness, reliability, and trustworthiness of DL models in real-world operational environments.

Research Aim:
Inspired by work in engineering and assessing conventional software systems, a diverse set of techniques for assessing the trustworthiness of AI models has been proposed. These range from methods for testing and verifying these models to principled methodologies for data augmentation and uncertainty quantification at runtime. This PhD project will investigate novel approaches to improve the robustness and generalisation of Deep Learning models under conditions of uncertainty, distributional shift, and adversarial interference. The research will combine theoretical analysis with experimental validation to develop next-generation DL systems capable of maintaining consistent performance across diverse and unpredictable environments.

Potential Research Themes include:

- Developing principled frameworks for robust training and uncertainty quantification in DNNs.
- Exploring domain adaptation and generalisation techniques for shifting data distributions.
- Investigating adversarial robustness and defence mechanisms for safety-critical DL systems.
- Evaluating and benchmarking DL robustness in real-world case studies (e.g., healthcare, aviation, autonomous vehicles).

The selected candidates will have the opportunity to collaborate within international research projects, including the ASTIR Horizon Europe initiative, and contribute to impactful advancements at the

intersection of AI and software engineering. Financial support opportunities, particularly for exceptional candidates, exist through contributions to project deliverables or involvement in teaching activities. These opportunities can be discussed during the interview stage.

Required Qualifications

- A Bachelor's and Master's degree in Computer Science, Mathematics or related fields.
- Strong background in AI and/or software engineering and/or applied mathematics.
- Proficiency in Deep Learning frameworks such as Pytorch and Tensorflow are highly desirable.
- A keen interest in the reliability and safety of AI systems are highly desirable.
- Excellent communication skills in English (written and spoken).
- Self-motivation, teamwork and a commitment to high-quality research.

Funding

Financial support opportunities, particularly for exceptional candidates, exist through contributions to the deliverables of the ASTIR Horizon Europe project, deliverables of the advisor's starting grant, and involvement in teaching activities. Indicative financial support at the time of writing this announcement is 13,000€ per annum and 3,000€ for fee support, for approximately three years.

Research Advisor

Name/Surname: Dr Simos Gerasimou
Position: Assistant Professor
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Doctoral Vacancy Announcement form

Research Topic Title: Neonates diaphragmatic movement monitoring using ultrasound video analysis

No. of Openings: 1

Description: The diaphragm is responsible for about 70% of the tidal volume during rest breathing. Moreover, when diaphragmatic function is impaired, it may result in respiratory medical conditions, causing significant difficulty in breathing, frequently necessitating prolonged mechanical ventilation support. In healthy humans, the diaphragm breathing activity can be detected as early as 10 to 12 weeks of gestation, occurring at an average frequency of 60 per minute. Neonates primarily rely on abdominal respiration because their ribcages are not fully developed, unlike those of older children and adults. Identifying neonatal diaphragmatic dysfunction through ultrasound video is crucial, particularly in cases involving diaphragmatic paralysis which may benefit from therapeutic interventions tailored and prolonged ventilatory support.
The purpose of this PhD will be to propose an integrated semi-automated video analysis system for the accurate diaphragmatic motion analysis in neonates. The candidate will employ real-time video analysis to capture movement and monitor diaphragmatic motion from ultrasound b-scan videos. A particular emphasis will be placed on understanding movement and monitor variability. In addition, the project will incorporate artificial intelligence and deep learning methodologies to develop predictive models for diaphragmatic motion, leveraging features derived from the ultrasound videos .
The candidate(s) must have good programming skills mainly in Python language.

Required Qualifications: Degree in Computer Science/Engineering Electrical Engineering, or biomedical engineering

Funding: Funding possibility through EU projects

Research Advisor:
Name/Surname: Efthyvoulos Kyriacou
Position: Assistant Professor
Email: efthyvoulos.kyriacou@cut.ac.cy