Cyprus University of Technology | Studies and Student Welfare Services

Doctoral Vacancy Announcement form

Research Topic Title:

Space and Ground Remote Sensing Datasets for Archaeo-landscape Studies.

No. of Openings: 1

Description: The fusion or integration of remote sensing data and sensors for studies of archaeological interest constitutes a distinct research topic that remains open. The complexity of this subject lies in the different mode of operation of each remote sensing sensor, their spectral recording sensitivity, as well as the inherent heterogeneity and uniqueness of the archaeological landscape.

The availability of large (geo-spatial) and open geo-data, commonly referred to today as Big Data, along with the development of new artificial intelligence (AI) techniques related to image processing and data analysis, provide a new perspective for future research. Machine Learning and Deep Learning algorithms enable the automatic recognition of patterns, the classification of archaeological structures, and the estimation of the potential location of buried remains with greater accuracy.

The candidate is expected to contribute significantly—through their research—to the understanding and optimization of non-destructive combined techniques for archaeological landscape studies, leveraging modern artificial intelligence capabilities for the analysis and interpretation of remote sensing data.

Required Qualifications: -

Funding: Funding for the position is not guaranteed, but it will be possible to attract partial/full funding from various research calls.

Research Advisor:
Name/Surname: Athos Agapiou
Position: Asst. Prof.
Email: athos.agapiou@cut.ac.cy

Research Topic Title:

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Earth Observation Datasets and Analysis for Endangered Monuments and Sites.

No. of Openings: 1

Description: Satellite images can record in a short period of time large areas in a systematic way, including archaeological sites and monuments. Their ability to record electromagnetic radiation in wavelengths beyond the visible (near - middle infrared and thermal bands) allow better observation, analysis and mapping of threatened sites and monuments, especially in areas affected after a natural or man-made hazard.

The aim of the present research is to contribute to the improvement of existing research methods, especially by exploiting open and freely available satellite images, such as the Sentinel images of the Copernicus European space programme, by developing novel methodology that will allow a more accurate mapping as well as risk indicators for monuments and places.

Required Qualifications: -

Funding: Funding for the position is not guaranteed, but it will be possible to attract partial/full funding from various research calls.

Research Advisor:
Name/Surname: Athos Agapiou
Position: Asst. Prof.
Email: athos.agapiou@cut.ac.cy

Research Topic Title: Innovative land use modelling for sustainable urban planning

No. of Openings: 1

Description:
Urbanisation poses significant challenges and opportunities for sustainable development, with approximately 56% of the global population in urban areas projected to reach 70% by 2050. Urban expansion increases land resource demand and requires innovative urban planning and land-use management solutions. Since the 1990s, Geographic Information Systems (GIS) and Planning Support Systems have been used as effective planning tools. Artificial Intelligence (AI) has recently become crucial for sustainable and resilient city planning and management. Advanced land-use modelling that incorporates AI and GIS offers a promising approach to address these challenges. Furthermore, spatial computational methods (SCM), such as Cellular

Automata (CA) and agent-based models (ABM), are used for urban land dynamics and planning. Despite the promising integration of AI and SCM into urban planning tools, few approaches have been adopted by professionals. Additionally, there is limited focus on AI applications in urban planning and decision-making activities, such as scenario land use planning.

Thus, it is essential to bridge this gap by developing and implementing innovative land-use models that support sustainable urban planning through interdisciplinary approaches, for example, by including climate change adaptation and UN Agenda 2030 goals. Moreover, transparent and interpretable AI models are required to enhance stakeholder understanding and foster collaboration between technologists, urban planners, and communities. Therefore, this scientific research aims to develop and evaluate innovative urban planning models using GIS, AI techniques, and advanced spatial computational methods to support urban spatial planning and decision-making. The policy relevance and practical applicability of the developed models will be assessed based on clearly identified scientific gaps and stakeholder-driven planning needs. The research will begin with an extensive literature review and methodological benchmarking, leading to the formulation of clearly defined research questions and a robust modelling framework in collaboration with the supervisory team.

The candidate is expected to make a significant contribution to advancing the integration of AI and GIS into urban planning processes, particularly through the development of innovative and practical models for sustainable land-use management. Additionally, the candidate will contribute to bridging the gap between theoretical AI applications and real-world urban planning practices, providing valuable insights into how interdisciplinary approaches can be utilized to meet sustainability goals.

Required Qualifications:

- University degree in a field such as: Urban Planning, Geography, Rural and Surveying Engineering/Geoinformation, Civil Engineering, Computer Science, or related field.
- Master's degree in a field such as: Urban Planning, Smart Cities, Geographical Information Systems, Geo-information, Artificial Intelligence, Data Science, or related field.
- Desirable the ability to learn programming within ArcGIS e.g. using Python (ArcPy).
- Excellent knowledge of English.

Funding:

Funding for the position is not available at the current stage, but it will be possible to attract partial/full funding from research calls.

Research Advisor:

Cyprus University of Technology | Studies and Student Welfare Services

Name/Surname: Dr. Demetris Demetriou
Position: Lecturer
Email: demetris.s.demetriou@cut.ac.cy

Research Topic Title: Land Readjustment using emerging technologies

No. of Openings: 1

Description:
Urbanisation is a defining trend in the 21st century, with the global urban population projected to increase from approximately 56% to 70% by 2050. The UN Urban Agenda 2030 emphasises the significance of sustainable urban development. A key strategy for achieving these objectives is land readjustment, a combined planning and financing urban land development approach that consolidates land parcels into a unified area in which a master plan is applied, followed by the subdivision of land plots. Subsequently, services and infrastructure, such as streets, parks, and utilities, are constructed, and new plots are redistributed to the original landowners. The entire process involves collaborations between landowners, local municipalities, other authorities, and/or the government. The participatory approach ensures that development costs and benefits are shared between landowners and the government/municipality. Landowners contribute portions of their property to infrastructure development and open spaces without monetary compensation and may also offer additional land to pay the proportion of costs owed to the project.

Despite the relatively extensive implementation of land readjustment in approximately 29 countries and the substantial evolution of information technology, there is currently a lack of specialised systems to adequately support the entire process of land readjustment. Typically, general software systems such as Geographical Information Systems (GIS) and/or CAD, specific modules for land subdivision design, and country tailor-made modules, e.g. to calculate and allocate costs after project implementation, are utilized. Most of the research focuses on developing specific systems, tools, or algorithms for rural land consolidation projects, and only a few studies have examined land readjustment and GIS. Some existing studies have focused on one stage of land readjustment, the automated subdivision of land plots, although they disregarded the other phases of the process. Furthermore, these studies were outdated. Consequently, there is a lack of an integrated system or module for both planning and decision making, encompassing all stages of the LR process.

Based on the above, this doctoral research aims to support land readjustment by developing a set of geo-planning tools by integrating GIS, artificial intelligence (Geo-AI field) (e.g. machine learning, deep learning, convolutional neural networks, evolutionary computing, large language

models). This system enhances the efficiency, accuracy, and transparency of LR processes in terms of planning, design, and decision making. The PhD will begin with a systematic literature review and requirements analysis (process + stakeholders), which will refine the final research questions and system scope.

The candidate is expected to contribute to the development of new scientific knowledge, models, and tools that can be used for the automation and support of decision-making regarding urban land readjustment. Alternatively, the focus can be on rural land consolidation.

Required Qualifications:

- University degree in a field such as: Rural and Surveying Engineering/Geoinformation, Urban Planning, Geography, Civil Engineering, Computer Science, or related field.
- Master's degree in a field such as: Geographical Information Systems, Geo-information, Remote sensing, Artificial Intelligence, Data Science, or related field.
- Desirable the ability to learn programming within ArcGIS e.g. using Python (ArcPy).
- Excellent knowledge of English.

Funding:

Funding for the position is not available at the current stage, but it will be possible to attract partial/full funding from a proposal that submitted and expected the outputs.

Research Advisor:
Name/Surname: Dr. Demetris Demetriou
Position: Lecturer
Email: demetris.s.demetriou@cut.ac.cy

Research Topic Title: Modelling climate change and land policies to support disaster risk management

No. of Openings: 1

Description:
This research focuses on addressing the challenges posed by climate change, which is increasing the frequency and intensity of natural disasters such as wildfires, floods, and droughts. Effective land policies that mitigate these risks are essential for enhancing resilience and reducing disaster-related losses. This research aims to develop innovative models that integrate climate change factors into land use planning and disaster risk management by utilizing Google Earth Engine

(GEE), a powerful cloud-based geospatial platform.

The study will use a district in Cyprus (e.g. Limassol District) as a case study area, allowing the exploration of how different land policy scenarios (e.g., zoning restrictions, reforestation programs, and floodplain management) can reduce vulnerabilities to natural disasters. The study will prioritise one or two hazards (e.g., wildfires and floods), selected based on scientific gaps, data availability, and stakeholder needs. Through scenario-based modeling, the research will simulate the impact of land policies on selected disaster risks. The effectiveness of policy scenarios will be assessed using quantitative risk metrics, sensitivity analysis, and uncertainty evaluation to ensure robust and reproducible results. By incorporating near real-time Erath Observation (EO) and climate datasets, the models will assess how these policies enhance climate resilience and contribute to long-term disaster mitigation.

Key objectives include the identification of relevant land policies, integration of climate change projections into simulations, and the evaluation of policy effectiveness through time-series analysis and spatial data. The project will focus on testing a few land policy scenarios, including urban sprawl control, conservation measures, agricultural land use conversion, and disaster risk management. Outcomes from the models will provide data-driven insights and recommendations for policymakers to optimize land use strategies and enhance disaster resilience.

The candidate is expected to contribute to the development of new scientific methodologies and tools for disaster risk assessment and land policy analysis to fill critical gaps in current approaches to disaster risk management in the context of climate change, with implications for broader regional and global applications.

Required Qualifications:

- University degree in fields such as: Geosciences, Agricultural Science, Geography, Environmental Engineering/Science, Civil Engineering, Rural Surveying Engineering/Geoinformation, Urban Planning, Physics, Computer Science, or related field.
- Master's degree in a field such as: Geographical Information Systems, Geo-information, Remote sensing, Artificial Intelligence, Data Science, Climate Change, Environmental Science/Engineering, Emergency/Disaster Management, or related field.
- Desirable the ability to learn programming within ArcGIS e.g. using Python (ArcPy).
- Excellent knowledge of English.

Funding:

Funding for the position is not available at the current stage, but it will be possible to attract

partial/full funding from research calls.

Research Advisor:
Name/Surname: Dr. Demetris Demetriou
Position: Lecturer
Email: demetris.s.demetriou@cut.ac.cy

Research Topic Title: Automating the creation of 3D Cadastre models using special drawings and 3D City Models

No. of Openings: 1

Description:
This proposed research addresses a critical gap in the automation of transforming 2D cadastral drawings, commonly used in Cyprus for registering horizontal properties such as apartments, into fully functional 3D cadastral systems. Currently, these 2D special drawings, which detail the internal divisions of buildings including rooms, parking spaces, and common areas, are the foundation for property registration. However, there is no automated method to convert these 2D representations into 3D models that can capture the complex spatial and ownership relationships inherent in multi-level urban structures. This lack of automation represents a significant research gap, particularly as cities worldwide are moving toward more integrated 3D cadastre systems for modern land administration.

The aim of this research is to develop an automated process for generating 3D cadastre from these 2D special drawings, with the goal of integrating them into existing 3D city models. By automating the recognition of different property ownership layers and shared spaces, the research will offer a solution to the challenges posed by manually converting this data. A key scientific challenge is the accurate reconstruction of 3D topology and legal boundaries, ensuring geometric consistency between floors, units, and shared spaces, while preserving ownership semantics and spatial relationships. The project will leverage existing tools such as ESRI CityEngine, ArcGIS, and BIM software like Revit for 3D model creation, while employing Python scripting and ArcPy to automate the extraction and processing of data from the 2D drawings. Moreover, artificial intelligence methods, particularly computer vision and pattern recognition, will be explored to further automate the interpretation and transformation of these drawings into 3D spatial divisions, thereby reducing manual input and improving efficiency. The proposed workflow will also consider interoperability with international 3D land administration standards such as ISO 19152 (LADM), supporting future integration into modern digital cadastral infrastructures.

This research is particularly important as it addresses the need for more accurate and efficient cadastral systems that can be utilized in urban planning, property management, and disaster preparedness. By automating the generation of 3D cadastre, this work will contribute to modernizing land administration practices, offering a comprehensive view of property rights in complex urban settings.

The expected contribution of the candidate will be the development of a novel workflow or software tool that facilitates the rapid creation of 3D cadastral models, enhancing land management and urban planning capabilities both in Cyprus and internationally.

Required Qualifications:

- University degree in a field such as: Rural Surveying Engineering/Geoinformation, Computer Science, Civil Engineering, Urban Planning or related field.
- Master's degree in fields such as: Geographical Information Systems, Geo-information, Urban Informatics/Smart cities, Computational geometry, Artificial Intelligence, Data Science, or related field.
- Desirable the ability to learn programming within ArcGIS e.g. using Python (ArcPy).
- Excellent knowledge of English.

Funding:

Funding for the position is not available at the current stage, but it will be possible to attract partial/full funding from research calls.

Research Advisor:
Name/Surname: Dr. Demetris Demetriou
Position: Lecturer
Email: demetris.s.demetriou@cut.ac.cy

Research Topic Title: Enhancing Industrial Diagnostics through Motion Amplification Video Technology

No. of Openings: 1

Description: This PhD research aims to advance the field of industrial diagnostics by developing and optimizing Motion Amplification Video (MAV) technology. The study will focus on creating innovative algorithms to enhance the detection and visualization of subtle mechanical vibrations and structural movements. By integrating MAV with predictive maintenance strategies, the research seeks to improve the accuracy of fault detection, reduce downtime, and extend the

lifespan of critical machinery. The outcomes will contribute to safer, more efficient industrial operations and provide a robust framework for future technological advancements in the field.

Required Qualifications:

- A M.Sc. in computer vision science, mechanical engineering, or a related field.
- Experience with image processing and algorithm development.
- Interest in industrial diagnostics and predictive maintenance.
- Good knowledge of English language

Funding: None.

Research Advisor: Dimitrios Skarlatos
Name/Surname: Dimitrios Skarlatos
Position: Professor
Email: dimitrios.skarlatos@cut.ac.cy

Research Topic Title: Advancing Underwater Imaging for Water Effect Removal

No. of Openings: 1

Description: This PhD research aims to advance through-water imaging technology by developing and further improving existing methods for water effect removal techniques. The research will focus on creating advanced algorithms to correct optical distortions caused by water wave surfaces, thereby enabling high-resolution aerial imaging of underwater environments by drones. By integrating fluid lensing with remote sensing and computational imaging, the study seeks to improve the detection and monitoring of marine ecosystems, support bathymetric mapping, and relevant applications. The outcomes of this research will contribute to more effective environmental monitoring and provide a robust framework for future technological advancements in underwater imaging.

Required Qualifications:

- A M.Sc. in computer vision science, software engineering, Machine learning, or a related field.
- Experience with image processing and algorithm development.
- Interest in underwater imaging and environmental monitoring.
- Good knowledge of English language

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Funding: None at the beginning on the project.

Research Advisor: Dimitrios Skarlatos
Name/Surname: Dimitrios Skarlatos
Position: Professor
Email: dimitrios.skarlatos@cut.ac.cy

Research Topic Title: Exploiting NeRFs and Gaussian Splatting for Cultural Heritage 3D Documentation

No. of Openings: 1

Description: This PhD research aims to advance the field of cultural heritage documentation by leveraging Neural Radiance Fields (NeRFs) and Gaussian Splatting techniques. The research will focus on developing and optimizing innovative methods to enhance the 3D visualization and preservation of cultural heritage sites and artifacts. By integrating NeRFs' high-fidelity visualization capabilities with the real-time rendering efficiency of Gaussian Splatting, the study seeks to create detailed, interactive, and immersive 3D models of cultural heritage objects. The outcomes will contribute to more effective preservation, study, representation and dissemination of cultural heritage, providing a robust framework for future technological advancements in the field.

Required Qualifications:

- A M.Sc. in computer vision science, computer graphics, or a related field.
- Experience in 3D documentation and reconstruction of cultural heritage, or image processing and algorithm development.
- Interest in cultural heritage preservation and documentation.
- Good knowledge of English language

Funding: Possibility of funding.

Research Advisor: Dimitrios Skarlatos
Name/Surname: Dimitrios Skarlatos
Position: Professor
Email: dimitrios.skarlatos@cut.ac.cy

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Research Topic Title: Combinatorial methods for the geometric documentation, visualization, and rendering of cultural heritage spaces, monuments, and buildings

No. of Openings: 1

Description: This doctoral research focuses on the development and application of combinatorial methods for geometric documentation, visualization, and representation of complex cultural heritage sites and monuments. The central objective of the study is the convergence of traditional and modern recording techniques (such as photogrammetry and laser scanning) with emerging computer vision and artificial intelligence technologies.

The research seeks to establish a unified methodological framework for the production of high-accuracy hybrid digital twins, emphasizing both precise geometric data and photorealistic rendering. Through the combinatorial analysis of data, the dissertation explores new ways of managing and presenting cultural information, making it accessible for scientific study, digital preservation, and interactive public engagement. The expected outcomes will provide innovative tools for the promotion of architectural heritage, enhancing the sustainability and dissemination of historical memory within the modern digital landscape.

Required Qualifications:

- A M.Sc. in computer vision science, computer graphics, or a related field.
- Experience in 3D documentation and reconstruction of cultural heritage, or image processing and algorithm development.
- Interest in cultural heritage preservation and documentation.
- Good knowledge of English language

Funding: Possibility of funding.

Research Advisor: Dimitrios Skarlatos
Name/Surname: Dimitrios Skarlatos
Position: Professor
Email: dimitrios.skarlatos@cut.ac.cy

Research Topic Title: Transportation Engineering

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No. of Openings: 2

Description:

The Transportation Engineering Lab at the Civil Engineering and Geomatics Department in Cyprus University of Technology invites applications for a full-time or part-time PhD position starting January 2026. This is an open call for highly motivated candidates eager to contribute to cutting-edge research in transport systems, mobility, and infrastructure.

Potential areas of study (non-exhaustive)

- Traffic Operations, Modelling, and Simulation
- Infrastructure Resilience, Vulnerability and Adaptation
- Urban Mobility and Multimodal Transport
- Artificial Intelligence in Transportation
- Road Safety
- Equitable and Inclusive Transport Planning

The PhD topic will be refined based on the selected candidate's strengths and research interests.

Required Qualifications:

- Master's degree in civil/Transportation Engineering, Urban Planning, or a closely related field.
- Familiarity with transport systems analysis, GIS, and statistical or simulation-based modelling
- Proficiency in at least one programming language (Python, R, or MATLAB).
- Strong analytical, communication, and academic writing skills.
- Familiarity with PTV Vissim/Visum is an asset (not mandatory).

Research Advisor:

Name/Surname: Paraskevas Nikolaou
Position: Lecturer
Email: paraskevas.nikolaou@cut.ac.cy

PhD Position:	**Remote sensing, AI and process-based modelling for soil health, productivity and regenerative agriculture**

Context

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Agriculture is facing unprecedented challenges under the combined pressures of climate change, soil degradation, water scarcity, and the need to ensure long-term food security. Rising temperatures, altered precipitation regimes, and the overuse of fertilizers and irrigation are intensifying soil fertility decline, salinization, and carbon losses, threatening both productivity and ecosystem resilience. At the same time, new opportunities are emerging through the integration of advanced monitoring technologies, artificial intelligence (AI), and process-based models, which allow us to better understand biogeochemical cycles, optimize land management, and design regenerative practices. A critical component of this transition is the development of robust Monitoring, Reporting and Verification (MRV) frameworks that can generate scientifically sound evidence for soil carbon dynamics, enabling credible participation in carbon credit schemes and other sustainability-driven mechanisms. This PhD position will contribute to this transformation by developing innovative tools and methods to monitor, model, and restore agricultural soils, while establishing verifiable impact assessment frameworks for sustainable farming systems.

Research Objectives

The successful candidate will:

- Leverage remote sensing and in-situ sensor networks to monitor soil and crop conditions, including moisture dynamics, salinity, vegetation stress, and productivity.
- Develop and implement **AI and machine learning approaches** for predictive modelling and high-resolution mapping of soil organic carbon (SOC), fertility, and degradation indicators.
- Exploit process-based biogeochemical models (such as DNDC, DAYCENT, LDNDC, or comparable frameworks) to simulate carbon, water, and nutrient cycles under different land management and regenerative practices.
- Design and evaluate soil restoration and regenerative agriculture strategies (e.g., biochar, circular bioeconomy practices) for their impacts on soil health, productivity, nutrient use efficiency, and resilience.
- Contribute to a robust **MRV system** that integrates ground truthing, laboratory data, satellite imaging, and modelling outputs.

Methods & Tools

- Earth Observation approaches (satellite and UAV data, vegetation and soil indices, thermal imagery, etc.).
- In-situ monitoring techniques (e.g., soil moisture, temperature, soil respiration measurements, and related field instruments).
- Predictive modelling frameworks (AI, machine learning, knowledge-guided algorithms).
- Process-based biogeochemical models (e.g., DNDC, DAYCENT, LDNDC, or comparable tools).

- Soil sampling and laboratory analyses of fertility and degradation indicators (e.g., SOC, nutrients, salinity).

Candidate Profile

- Master's degree (or equivalent) in Environmental Science, Soil Science, Agronomy, Remote Sensing, Geoinformatics, or related fields.
- Solid Knowledge of soil science, crop production systems, and land management
- Background in one or more of: remote sensing, soil science, biogeochemical modelling, machine learning, or agricultural systems.
- Programming and data analysis skills (Python, R, MATLAB, or similar).
- Interest in interdisciplinary research combining fieldwork, modelling, and data science to address sustainability challenges.
- Strong written and oral communication skills.

Research Advisor:
Name/Surname: D. Gl. Hadjimitsis
Position: Professor
Email: d.hadjimitsis@cut.ac.cy

Research Topic Title: "Atmospheric Research and Remote Sensing of the Atmosphere"

No. of Openings: 2

Description: Each position offers excellent possibilities for professional development of highly motivated individuals in the framework of the EU-H2020 "EXCELSIOR" Horizon 2020 Widespread Teaming Phase 2 project (www.excelsior2020.eu) within which the Cyprus University of Technology established the ERATOSTHENES Centre of Excellence for Earth Surveillance and Space-Based Monitoring of the Environment in cooperation with EU Advanced Partners [the German Aerospace Centre (DLR), the National Observatory of Athens (NOA), the German Leibniz Institute for Tropospheric Research (TROPOS), and Physikalisch-Meteorologisches Observatorium Davos, World Radiation Center (PMODWRC)].

The PhD positions refer to the research topic the Atmosphere sector of the Department of Environment and Climate of the ERATOSTHENES Centre of Excellence ('Excelsior Phase 2' H2020 Teaming Grant Agreement NO.857510 (www.excelsior2020.eu)).

The successful applicants will be based at the Civil Engineering Department of the Cyprus University of Technology and will work in an international, vibrant research environment, having

access to state-of-the-art instruments of the Sector of Atmosphere of the ERATOSTHENES CoE. The PhD students will be supervised in close collaboration with researchers from the advance partner of TROPOS and PMOD/WRC.

The successful candidate will advance the ERATOSTHENES CoE research and innovation agenda in its scientific focus of Environmental Observations area through experimental research on the field of Atmospheric Remote Sensing. The ground-based remote sensing research Infrastructures of the ERATOSTHENES CoE is used to monitor the atmospheric processes and provide profiling of aerosol, clouds and wind to study microphysical process in Limassol, Cyprus.

The successful candidate will be involved in the operation of the remote sensing facilities of the Centre and will participate in numerous training and field campaigns relevant to the topic of performed research.

The two (2) PhD positions in the field of Earth Observation & Remote Sensing in the subject area of Atmospheric Remote Sensing Research will focus on:

1. The PhD thesis focuses on the synergy of ground based remote sensing and satellite data for atmospheric research.
2. The PhD thesis focuses on dust modelling and forecasting

The Scientific approach will include:

• Remote Sensing Observations for Atmospheric Research
• Analysis of atmospheric ground-based observations with remote sensing instruments
• Analysis of space-borne remote sensing atmospheric parameters in support of ground-based observation
• Synergetic analysis of multi-platform aerosol datasets (e.g spaceborne and ground based remote-sensing and in situ)
• Application and development of innovative data processing chains
• Follow up quality standards and quality assurance tools of ground remote sensing observations

Responsibilities/activities to be involved in:

• Participation to training activities and Research Infrastructures installation
• Responsible for the operation of remote sensing atmospheric following international standard operating procedures.
• Responsible for data processing using advanced software tools.
• Contribute to research related to Atmospheric Remote Sensing Observations

• Contribute to publications and communicate the research output and implications at different levels, including academic, public and policy related.
• Participate in the field intensive campaigns and research demonstration projects of ERATOSTHENES CoE
• Actively pursue regional and international networking, by participating in national and international conferences.

Required Qualifications:

• Master's degree in Atmospheric Sciences, Physics, Environmental Studies, Meteorology, Engineering or related field.
• Basic knowledge of environmental physics and remote sensing.
• Basic knowledge of programming (e.g. Matlab, R, Python).
• Ability for scientific communication in English both verbal and writing.
• Strong analytical and organizational skills.
• High interpersonal skills and ability to work in a team.
• Willingness to participate in scientific experiments and field campaigns.
• Willingness to travel abroad and to participate in training activities, workshops and conferences.
• Experience in atmospheric remote sensing techniques is of advantage
• Driving license.

Funding: The successful candidate will be employed as Graduate Research Assistant at the ERATOSTHENES Centre of Excellence.

We offer competitive financial support with the exact salary level will be confirmed during the interview.

Maximum Gross monthly salary in case of full time €2122

Duration: 36 Months

Research Advisor:
Name/Surname: D. Gl. Hadjimitsis
Position: Professor
Email: d.hadjimitsis@cut.ac.cy

Research Topic Title: Earth Observation & Remote Sensing & Geoinformatics (Earth Surveillance & Space Monitoring of the Environment) in any of the following subjects:

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No. of Openings: 8

Description:

"Environment and climate (agriculture, water resources, land use, natural and built environment)"

Agriculture: Modeling of Earth observation data for agricultural applications (e.g. agricultural monitoring, Common Agricultural Policy, sustainable agricultural practices, tools to support farmers, agricultural consultants and agricultural aid Paying Agencies, food security, Carbon Footprint)

Water Resources: Water resources management (e.g. drought, hydrodynamic energy, hydrological analysis, use of Copernicus data, river basin monitoring, coastal zone monitoring)

Land Use: Land use and smart cities, urbanization, forest monitoring, forest management.

"Resilient societies (disaster risk reduction, cultural heritage, maritime safety)"

Floods & Fires: Integrated use of Space, Geoinformation and Data analytics for disaster-related and natural hazards applications, including floods and fires (e.g., satellite remote sensing, diachronic burnt scar mapping, flood mapping, early warning, dynamic monitoring, modeling, active fire detection, burned area assessments, flood risk management plans, diachronic mapping of flooded areas).

Earthquakes / Geohazards:
• Integration of satellite Interferometry products with GNSS measurements and corner reflectors measurements for geohazards monitoring (e.g. geohazards, interferometry, deformations, landslides, subsidence, landslides, emergency management)
• Risk assessment, impact criteria scenario assessment, probabilistic estimations of losses
• Multi-hazard risk assessment

Health: Big Earth Observation data for applications related to seasonal diseases (e.g. epidemiology, vector, West Nile virus, dynamic modeling, machine learning)

Cultural heritage:
• European Copernicus Programme Evolution for Cultural Heritage Cross-service
• Use of virtual reality for restoration and reinforcement of monuments.
• Assessment of the risk of monuments and cultural heritage sites from geo-hazards.

Marine Surveillance: Marine environment monitoring, maritime safety and protection, maritime spatial planning, fish farming monitoring.

Investigation and monitoring of infrastructure/ roadworks (e.g. transport pavements)

"Big data management (information extraction, visual exploration and imaging, information collection and data fusion, geoinformatics)."

- Analysis of big geodata for the monitoring of seasonal diseases,
- Machine learning and artificial intelligence in geodata analysis,
- Development of Interoperable Geoinformatics and Geodesy Services,
- GNSS Big Data Management & Control
- Design and implementation of standard unmanned aerial platforms (UAVs) for environmental, urban, marine and agricultural management.
- Design and implementation of an integrated crisis management system with GIS technologies
- Digital Twins for several applications (e.g. Climate, Maritime/Ocean etc)
- Artificial Intelligence in Earth Observation
- STEM-Εκπαίδευση & Ισότητα των Φύλων στην Παρατήρηση της Γης & Γεωπληροφορική

Through the 'ERATOSTHENES: Excellence Research Centre for Earth Surveillance and SpaceBased Monitoring of the Environment' with the acronym: 'EXCELSIOR', Horizon 2020 Widespread Teaming Phase 2 project (www.excelsior2020.eu), a new, autonomous and self-sustained Centre of Excellence entitled as 'ERATOSTHENES Centre of Excellence (ECoE)' (www.eratosthenes.org.cy) has been created. The ECoE focuses on conducting basic and applied research, and enabling innovation in the areas of remote sensing and space-based monitoring the environment. There are distinct needs and opportunities that motivate the establishment of an Earth Observation Centre of Excellence in Cyprus, which are primarily related to the geostrategic location of Cyprus that allows us to examine complex scientific problems and address user needs in the Eastern Mediterranean, Middle East and Northern Africa (EMMENA), as well as South-East Europe. An important objective of the ECoE is to become a fully functional Digital Innovation Hub and a Research Excellence Centre for EO in the EMMENA region. The DIH will create an ecosystem which combines state-of-the-art sensing and data management/processing technologies, cutting - edge research opportunities, targeted education services and promotion of entrepreneurship. In order to be dynamic and innovative, the DIH will be based on two major infrastructures, which are a Satellite Ground Receiving Station and a Ground.

The Consortium of the EXCELSIOR project consists of the Cyprus University of Technology (CUT), the German Aerospace Centre (DLR), the National Observatory of Athens (NOA), the German

Leibniz Institute for Tropospheric Research (TROPOS) and the Department of Electronic Communications (DEC) from the Deputy Ministry of Research, Innovation and Digital Policy of the Cyprus Government. In the supervision of the PhD students is expected to have academics and researchers from DLR, TROPOS, NOA and other organisations/universities/research centres that are supporting the EXCELSIOR H2020 Teaming Project. These PhD positions refer to the research topics of the 'Excelsior Phase 2' H2020 Teaming Grant Agreement NO.857510 (Eratosthenes Centre of Excellence) (www.excelsior2020.eu) as well to other projects running through ECoE.

Required Qualifications:

- Master's degree in relevant scientific field.
- Basic knowledge of remote sensing.
- Basic knowledge of programming (e.g. Matlab, R, Python).
- Ability for scientific communication in English both verbal and writing.
- Strong analytical and organizational skills.
- High interpersonal skills and ability to work in a team.
- Willingness to travel abroad and to participate in training activities, workshops and conferences.

Funding: The successful candidate will be employed as Graduate Research Assistant at the ERATOSTHENES Centre of Excellence. We offer competitive financial support with the exact salary level will be confirmed during the interview. Maximum Gross monthly salary in case of full time €2122

Duration: 36 Months

Research Advisor:
Name/Surname: D. Gl. Hadjimitsis
Position: Professor
Email: d.hadjimitsis@cut.ac.cy

Research Topic Title: "Improvement of solar radiation-energy forecasting using satellite and ground based remote sensing data / Optimizing Urban Energy Sustainability: Integration and Optimization of Solar Rooftop Photovoltaic Systems."

No. of Openings: 2

Description: The PhD position fall within the field of Energy, specifically focusing on Solar Energy Forecasting and Solar Radiation Interactions with Earth's Surface and Atmosphere:

• **Improvement of solar radiation/energy forecasting using satellite and ground based remote sensing of the atmosphere.**

✓ This PhD study aims to enhance solar radiation and energy forecasting by utilizing satellite and ground-based remote sensing technologies to monitor atmospheric conditions. The research will concentrate on refining radiative transfer and numerical weather prediction models to improve the accuracy of solar energy forecasts.

• **Optimizing Urban Energy Sustainability: Integration and Optimization of Solar Rooftop Photovoltaic Systems**

✓ This PhD thesis focuses on urban energy sustainability, particularly emphasizing the integration of solar rooftop photovoltaic (PV) systems into urban environments. The research will explore methods to optimize energy generation, distribution, and consumption through the effective integration and optimization of PV systems within urban landscapes.

The Scientific approach for the first position will include:

• Remote Sensing Observations of Global and Spectral Solar Irradiance: Utilizing remote sensing techniques to observe global and spectral solar irradiance, gathering data for analysis and modeling.
• Development of Radiative Transfer Models: Incorporating in situ measurements (solar, aerosol, clouds), Earth Observation (EO), and Copernicus Atmosphere Monitoring Service (CAMS) data to develop radiative transfer models. These models will be applied for both solar energy nowcasting and forecasting applications.
• Study of Solar Radiation Transfer through the Atmosphere: Investigating the transfer of solar radiation through the atmosphere and its interactions with various atmospheric variables, including ozone, aerosols, and clouds.
• Development of Innovative Data Processing Chains: Developing advanced data processing chains, including the application of artificial intelligence methods, to improve solar energy forecasting accuracy and reliability.
• Quality Standards and Assurance for Solar Irradiance Observations: Implementing and maintaining quality standards and quality assurance tools for ground-based spectral and broadband solar irradiance observations to ensure data accuracy and reliability.
• Calibration Procedures for Solar Radiation Instruments: Developing and testing calibration procedures for spectral, broadband, and narrowband solar radiation instruments to maintain measurement accuracy and consistency.
• Investigation of Spectral Solar Radiation Effects on Ecosystem and Human Health: Researching the impacts of changes in spectral solar radiation on ecosystems and human health, contributing to a deeper understanding of the interactions between solar radiation and biological systems.

And for the second:

• Integration of Urban Energy Dynamics: Investigating the integration of solar energy forecasting and irradiance modeling with urban energy dynamics to optimize energy generation and consumption within urban environments.
• Assessment of Urban Energy Infrastructure: Evaluating the impact of solar energy integration on existing urban energy infrastructure and developing strategies for seamless integration and optimization.
• Urban Microclimate Analysis: Studying the effects of solar radiation transfer on urban microclimates and assessing how urban morphology influences solar energy availability and distribution.
• Community Engagement and Stakeholder Collaboration: Engaging with local communities and stakeholders to understand their energy needs and preferences, and collaborating to develop tailored solar energy solutions that enhance urban sustainability and resilience.
• Policy and Regulatory Considerations: Considering policy and regulatory frameworks that support the integration of solar rooftop photovoltaic systems into urban environments and exploring potential barriers and opportunities for implementation.

Required Qualifications:

• Master degree in Atmospheric Sciences, Physics, Environmental Studies, Meteorology, Engineering or related field.
• Basic knowledge of environmental physics and remote sensing.
• Basic knowledge of programming (e.g. Matlab, R, Python).
• Ability for scientific communication in English both verbal and writing.
• Strong analytical and organizational skills.
• High interpersonal skills and ability to work in a team.
• Willingness to participate in scientific experiments and field campaigns.
• Willingness to travel abroad and to participate in training activities, workshops and conferences.
• Experience in atmospheric remote sensing techniques is of advantage
• Driving license.

Funding: The successful candidate will be employed as Graduate Research Assistant at the ERATOSTHENES Centre of Excellence. We offer competitive financial support with the exact salary level will be confirmed during the interview.

Maximum Gross monthly salary in case of full time €2122

Duration: 36 Months

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Research Advisor:
Name/Surname: D. Gl. Hadjimitsis
Position: Professor
Email: d.hadjimitsis@cut.ac.cy

Research Topic Title: "Remote Sensing, AI and GIS in Forestry"

No. of Openings: 2

Description: Emphasis on the use of remote sensing, artificial intelligence and geographic information systems in the broader area of forestry

The research activity will include:

1. Remote sensing and use of artificial intelligence in forestry
2. management of forest areas (e.g. climate change, forest fires, etc.)

Required Qualifications:

• A recognized university degree in the field of forestry, or natural sciences, or meteorology, or environmental sciences or other related subject.
• Five-year degree or integrated Master or Master's degree in forestry, or remote sensing, or environment, or meteorology or other related subject.
• Willingness to participate in scientific experiments and field measurements.
• Willingness to participate and attend scientific trainings and seminars in Cyprus and abroad.

Through the 'ERATOSTHENES: Excellence Research Centre for Earth Surveillance and SpaceBased Monitoring of the Environment' with the acronym: 'EXCELSIOR', Horizon 2020 Widespread Teaming Phase 2 project (www.excelsior2020.eu), a new, autonomous and self-sustained Centre of Excellence entitled as 'ERATOSTHENES Centre of Excellence (ECoE)' (www.eratosthenes.org.cy) has been created. The ECoE focuses on conducting basic and applied research, and enabling innovation in the areas of remote sensing and space-based monitoring the environment. There are distinct needs and opportunities that motivate the establishment of an Earth Observation Centre of Excellence in Cyprus, which are primarily related to the geostrategic location of Cyprus that allows us to examine complex scientific problems and address user needs in the Eastern Mediterranean, Middle East and Northern Africa (EMMENA), as well as South-East Europe. An important objective of the ECoE is to become a fully functional Digital Innovation Hub and a Research Excellence Centre for EO in the EMMENA region. The DIH will create an ecosystem which combines state-of-the-art sensing and data management/processing technologies, cutting - edge research opportunities, targeted education

services and promotion of entrepreneurship. In order to be dynamic and innovative, the DIH will be based on two major infrastructures, which are a Satellite Ground Receiving Station and a Ground.

The Consortium of the EXCELSIOR project consists of the Cyprus University of Technology (CUT), the German Aerospace Centre (DLR), the National Observatory of Athens (NOA), the German Leibniz Institute for Tropospheric Research (TROPOS) and the Department of Electronic Communications (DEC) from the Deputy Ministry of Research, Innovation and Digital Policy of the Cyprus Government. In the supervision of the PhD students is expected to have academics and researchers from DLR, TROPOS, NOA and other organisations/universities/research centres that are supporting the EXCELSIOR H2020 Teaming Project. These PhD positions refer to the research topics of the 'Excelsior Phase 2' H2020 Teaming Grant Agreement NO.857510 (Eratosthenes Centre of Excellence) (www.excelsior2020.eu) as well as to other projects running through ECoE.

Funding: The successful candidate will be employed as Graduate Research Assistant at the ERATOSTHENES Centre of Excellence through the EXCELSIOR H2020 TEAMING Project. We offer competitive financial support with the exact salary level will be confirmed during the interview. Maximum Gross monthly salary in case of full time €2122 (Eratosthenes CoE)

Duration: 36 Months

Research Advisor:
Name/Surname: D. Gl. Hadjimitsis
Position: Professor
Email: d.hadjimitsis@cut.ac.cy

Research Topic Title: GNSS and Natural Hazards

No. of Openings: 1

Description: The Cyprus University of Technology Laboratory of Geodesy is seeking a highly motivated and talented PhD student to join our dynamic research team. This position offers the unique opportunity to work on cutting-edge research on Global Navigation Satellite Systems (GNSS) techniques and the monitoring and analysis of natural hazards, such as landslides and earthquakes. The successful candidate will focus on the innovative application of GNSS techniques and the development of experimental configurations to enhance our understanding and response to these catastrophic events, contributing significantly to the safety and resilience of vulnerable communities at the national and international level.

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Key Responsibilities:

- Design and implementation of novel hardware platforms for GNSS data acquisition and processing, tailored to the detection and analysis of natural hazards.
- Development of advanced GNSS-related services, including real-time monitoring systems, predictive modeling, and decision-support tools.
- Conduct comprehensive fieldwork and data analysis to validate and refine GNSS applications in the context of natural hazard assessment.
- Collaborate with a multidisciplinary team of researchers, stakeholders, and industry partners to ensure the relevance and impact of research outcomes.
- Publication of research findings in high-impact scientific journals and presentation at international conferences.

Funding: The position will be partially funded by on-going research grants secured by the Laboratory of Geodesy and the ERATOSTHENES Centre of Excellence.

Required Qualifications:

- Master's degree in Geodesy, Geophysics, Earth Sciences, Computer Science, Electrical Engineering, or a related field.
- Strong programming skills in Python and/or C/C++.
- Experience with GNSS data processing and analysis is highly desirable.
- Knowledge of natural hazard dynamics, particularly related to landslides and earthquakes, is an advantage.
- Excellent analytical and problem-solving skills.
- Strong communication skills, both written and oral, in English.
- Ability to work independently as well as part of a team in a multidisciplinary environment.

Research Advisor:

Name/Surname: Dr Chris Danezis
Position: Associate Professor
Email: chris.danezis@cut.ac.cy

Research Topic Title: Design and Development of Systems for Multichannel Processing of Tidal and Meteorological Data

No. of Openings: 1

Description: The Cyprus University of Technology Laboratory of Geodesy invites applications for one (1) PhD student position focused on the design and development of systems from multichannel processing of tidal and meteorological data. The position will focus on the design

and implementation of systems that enable the integration and processing of data collected from tide gauge networks, with utmost objective the understanding of sea level variability and coastal impact.

Key Responsibilities:

- Design and Develop systems for the integration, storage, processing, and analysis of tidal and meteorological data.
- Develop tools for the visualization and analysis of time series of marine, meteorological, and geospatial data.
- Collaborate with other researchers to analyze data and synthesize results.
- Author and co-author research papers for publication in peer-reviewed journals and present findings at international conferences.

Funding: The position will be funded by on-going research grants secured by the CUT Laboratory of Geodesy and/ or the ERATOSTHENES Centre of Excellence.

Required Qualifications:

- Master's degree in one of the following disciplines: Computer Science, Geoinformatics, Electrical Engineering, Oceanography, Geodesy or other related field.
- Experience in programming with Python and/or Javascript and/or C#.
- Experience in developing web applications, including API development.
- Strong analytical and problem-solving skills.
- Excellent written and oral communication skills in English.
- Capable of working independently and collaboratively in an interdisciplinary team.

Preferred Qualifications:

- Experience with GIS platforms and geospatial data visualization.
- Experience in programming with Go or Rust.
- Experience in time series analysis or big data processing.
- Experience with cloud-based platforms (e.g., AWS, Azure etc.) for data storage and processing.

Research Advisor:

Name/Surname: Dr Chris Danezis
Position: Associate Professor
Email: chris.danezis@cut.ac.cy

Research Topic Title: Advanced Methods of Marine Data Analysis

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No. of Openings: **1**

Description: The Cyprus University of Technology Laboratory of Geodesy invites applications for one (1) PhD student position in the field of Marine Geodesy, focusing on the analysis of geodetic, oceanographic and meteorological information to better understand sea level variability and coastal erosion processes.

Key Responsibilities:

- Conduct detailed processing of geodetic, oceanographic and meteorological datasets to analyze sea level changes and the impact of coastal erosion.
- Develop and apply advanced AI algorithms for data processing and for the assimilation of heterogeneous datasets (satellite observations, in-situ measurements, and numerical models).
- Collaborate with other researchers to analyze data and synthesize results.
- Author and co-author research papers for publication in peer-reviewed journals and present findings at international conferences.

Funding: The position will be funded by on-going research grants secured by the CUT Laboratory of Geodesy and/ or the ERATOSTHENES Centre of Excellence.

Required Qualifications:

- Master's degree in one of the following disciplines: Geodesy, Oceanography, Earth Sciences, or other related discipline.
- Experience in programming with Python and/or C/C++ and/or Matlab, with a strong interest in developing software tools for data analysis.
- Strong analytical and problem-solving skills.
- Excellent written and oral communication skills in English.
- Capable of working independently and collaboratively in an interdisciplinary team.

Preferred Qualifications:

- Experience in data analysis using Artificial Intelligence.
- Basic knowledge of satellite altimetry.

Research Advisor:

Name/Surname: Dr Chris Danezis
Position: Associate Professor
Email: chris.danezis@cut.ac.cy

Research Topic Title: Virtual & Augmented Reality (VR & AR) in Cartographic visualization

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No. of Openings: 1

Description: Augmented and virtual reality (VR & AR) are rapidly advancing technologies that enhance users' perception of the real world by using virtual spaces or enhancing the real space with virtual elements. The geospatial community has been gradually focusing on VR & AR technologies and applications due to their ability to create immersive spatial experiences, facilitate spatial learning, and stimulate user experience. However, designing effective VR or AR interfaces poses several challenges, especially when a cartographic approach is realized. Scale issues and management of the Level of Detail (LoD) should be studied to create a concrete methodological approach when using high-resolution and accurate spatial data. Especially when data is provided from UAS airborne sensors, and a 3D virtual space or 3D objects need to be visualized. Cartographic perspectives are instrumental in addressing issues related to spatial and thematic levels of detail, as well as scale in virtual and augmented reality. By carefully considering scale, data representation, user interaction, and UX design, cartographers can create immersive and effective VR and AR experiences that provide valuable spatial and thematic information to users.

The candidate is expected to contribute significantly - through his research - to understanding. on the scale issues and management of LoD for VR & AR cartographic representations based on various dimensions that focus on the types of data that are visualized, the techniques used, and the user actions that trigger LoD change.

Funding: Partial funding for the position is secured, with additional opportunities to secure full funding from various research calls and projects.

Required Qualifications:

- University degree in a field such as Surveying Engineering, Civil Engineering, Geography, Urban Planning, Computer Science, Science (Physics or Mathematics), Multimedia or a related field.
- Master's degree in a field such as geographic information systems, geo-information, remote sensing, computer science, data science, or a related field.
- Visa (if not coming from the EU)

Additional qualifications that will be considered:

- Good knowledge of the English language
- Good knowledge of programming (Pytnon, C++, C#, or other relevant)
- Good knowledge of 3D visualizations software (Unreal Engine, Unity, ArcGIS 360 VR, or other relevant)

- Previous publications in scientific journals or announcements in conferences, symposiums, etc.

The application should include a letter of interest or statement of purpose written in English or Greek that explains/describes why the applicant wishes to undertake this specific study, his/her research objectives, and other relevant information (500 words maximum).

Research Advisor:
Name/Surname: Apostolos Papakonstantinou
Position: Assistant Professor
Email: a.papakonstantinou@cut.ac.cy

Research Topic Title: 3D Geovisualization of Spatiotemporal Changes using Game Engines.

No. of Openings: 1

Description: Advancements in 3D geovisualization techniques have revolutionized our ability to analyze and understand complex spatiotemporal data. In recent years, the integration of game engines into cartographic practices has emerged as a powerful tool for representing geospatial information in an immersive and interactive manner. This approach leverages the capabilities of popular game engines such as Unity and Unreal Engine to create dynamic and visually compelling representations of geographic data. Utilizing game engines for geovisualization to depict spatiotemporal changes at varying levels of detail allow users to navigate through intricate landscapes, zooming in from global scales to individual objects with ease. Additionally, on the thematic level, these engines allow for the dynamic visualization of data layers.
Building these new types of applications also involves working with digital twins. Thus, creating immersive ways to visualize and interact with real-world GIS assets that complement current workflows. A systematic exploration of the game engines' capabilities to depict thematic and photorealistic information of temporal changes over extended periods in various scales should be done. 3D geovisualization using game engines offers a powerful and flexible solution for exploring spatiotemporal changes with a cartographic perspective. It empowers users to engage with data interactively, enabling deeper insights into the dynamic nature of our world.
In this dynamic intersection of cartography and technology, the candidate will go deep into a judicious fusion of spatial and thematic levels of detail, scaled to the immersive canvas, to unlock the full potential of game engine based 3D geoviz exploration, learning, and decision-making in the digital age.

The candidate is expected to contribute significantly - through his research - to the understanding of the most efficient visualization approach using game engines to offer a powerful and flexible

solution for exploring spatiotemporal changes with a cartographic perspective. He will study how to stimulate users to interactively engage with data, enabling deeper insights into the dynamic nature of our world.

Funding: Partial funding for the position is secured, with additional opportunities to secure full funding from various research calls and projects.

Required Qualifications:

- University degree in a field such as Surveying Engineering, Civil Engineering, Geography, Urban Planning, Computer Science, Science (Physics or Mathematics), Multimedia or a related field.
- Master's degree in a field such as geographic information systems, geo-information, remote sensing, computer science, data science, or a related field.
- Visa (if not coming from the EU)

Additional qualifications that will be considered:

- Good knowledge of the English language
- Good knowledge of programming (Pytnon, C++, C#, or other relevant)
- Good knowledge of 3D visualizations software (Unreal Engine, Unity, ArcGIS 360 VR, or other relevant)
- Previous publications in scientific journals or prestntations in conferences, symposiums, etc.

The application should include a letter of interest or statement of purpose written in English or Greek that explains/describes why the applicant wishes to undertake this specific study, his/her research objectives, and other relevant information (500 words maximum).

Research Advisor:
Name/Surname: Apostolos Papakonstantinou
Position: Assistant Professor
Email: a.papakonstantinou@cut.ac.cy

Research Topic Title: Addressing Scale Issues in 3D Geovisualization for Mapping Spatiotemporal Phenomena

No. of Openings: 2

Description: This research aims to investigate scale-related challenges in 3D geovisualization, focusing on the representation and analysis of spatiotemporal phenomena. As geospatial

datasets grow in complexity and volume, effectively visualizing changes over time at multiple spatial scales becomes increasingly crucial. Traditional 2D and static 3D mapping approaches often struggle to balance detail, accuracy, and computational efficiency when representing dynamic processes across different resolutions. This study will explore how scale variations impact perception, interpretation, and decision-making in 3D geovisualization, particularly in applications such as coastal zone monitoring. By integrating data from drone-based LiDAR, multispectral, and hyperspectral sensors, this research will enable a high-resolution, multi-scale understanding of coastal dynamics, including erosion, vegetation changes, and land-use transformations. Machine learning techniques will be employed to analyze and classify spatiotemporal changes, optimizing the processing of large-scale geospatial datasets for enhanced 3D visualization. A key objective of this PhD is to develop methodologies and frameworks that enhance multi-scale 3D visualization techniques for mapping coastal zone changes over time in the context of climate change. This includes evaluating the effectiveness of level-of-detail (LoD) techniques, adaptive rendering, and scale-aware interaction models in immersive and web-based geovisualization platforms. The research will integrate drone and sensor-based observations with advanced data fusion techniques to create more accurate and scalable 3D models of coastal environments. Machine learning algorithms will be applied to detect patterns and automate change detection across varying spatial and temporal scales. Additionally, user-centered design principles and cognitive studies will be incorporated to assess how scale influences spatial reasoning and decision-making. By proposing innovative strategies for dynamic scale adaptation in 3D geovisualization, this study aims to improve the usability and interpretability of geospatial data, ultimately supporting better coastal management, environmental monitoring, and disaster risk assessment.

Funding: Partial funding for the position is secured, with additional opportunities to secure full funding from various research calls and projects.

Required Qualifications:

- University degree in a field such as Surveying Engineering, Civil Engineering, Geography, Urban Planning, Computer Science, Science (Physics or Mathematics), Multimedia or a related field.
- Master's degree in a field such as geographic information systems, geo-information, remote sensing, computer science, data science, or a related field.
- Visa (if not coming from the EU)

Additional qualifications that will be considered:

- Knowledge of 3D geovisualization techniques and tools such as CesiumJS, Blender, or Unity for geospatial applications.
- Familiarity with machine learning techniques (e.g., deep learning, classification, object detection) for geospatial data analysis.

- Strong analytical and problem-solving skills, with an ability to work independently and collaboratively.
- Excellent written and verbal communication skills in English, with experience in academic writing.
- Good knowledge of programming in (Python, R, or MATLAB or other relevant), with experience in geospatial data processing and analysis
- Good knowledge of 3D visualizations software (ArcGIS 360 VR, or other relevant)
- Hands-on experience with UAV (drone) operations and data collection.
- Previous publications in scientific journals or prestntations in conferences, symposiums, etc.

The application should include a letter of interest or statement of purpose written in English or Greek that explains/describes why the applicant wishes to undertake this specific study, his/her research objectives, and other relevant information (500 words maximum).

Research Advisor:
Name/Surname: Apostolos Papakonstantinou
Position: Assistant Professor
Email: a.papakonstantinou@cut.ac.cy