**JOB DESCRIPTIONS**

**ISLANDS – Doctoral Candidates (DCs) at The American College of Greece Research Center**

The American College of Greece Research Center (ACG-RC) is seeking to appoint two (2) Doctoral Candidates (DCs) to join the Marie Skłodowska-Curie Doctoral Network on "**Integrated Sensing and communications for future vehicuLAr systems a Network of Doctoral Students**" (ISLANDS).

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| **Positions 1 & 2**: | Doctoral Candidates (DCs) |
| **Location**: | [Athens, Greece] |
| **Working time**: | Full-time |
| **Duration**: | Fixed term (3 years) |
| **Living, mobility, family, and research allowances**: | In agreement with the MSCA Doctoral Network financial regulations https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/wp-call/2023-2024/wp-2-msca-actions_horizon-2023-2024_en.pdf (Section 1. MSCA DOCTORAL NETWORKS, page 81) |

**About ISLANDS**

For decades, communication systems have developed independently to radar systems, leading to a duplication of systems and devices that exploit the electromagnetic spectrum in similar ways. Yet, the future wireless infrastructure will need to do more than just communications to support smart cities, intelligent mobility, infrastructure monitoring, and security. It will need to perform multiple functions and will rely, increasingly, on high-reliability communication and sensing. The independent growth of radar and communication systems is no longer sustainable and will lead to a congestion of devices, transmitters and sensors. There is a skills gap in the community to address this, as communication engineers work separately from radar engineers, and a new set of skills needs to be developed. ISLANDS is a doctoral network that focuses on the theoretical and algorithmic foundations of integrated sensing and communication for the automotive sector, with the objective of developing new physical-layer and network-level solutions, to explore the fundamental limits of such technology, and to provide experimental validation and testing for the developed techniques. Specifically, ISLANDS will: 1) develop new transceiver algorithms, capable of integrating and leveraging the communication and sensing functionalities, with the purpose of achieving superior performance and energy and hardware efficiency; 2) investigate the ultimate network performance limits that the integration of communication and sensing can achieve in

environments with extreme mobility; and 3) provide experimental validations of the developed techniques with proof-of-concept testbeds and realistic system-level simulators. ISLANDS will train the next generation of EU experts and leaders with specific interdisciplinary expertise, combining sensing and communications, with the aim of reinforcing European leadership in the automotive sector of the next decades.

Further information about the two Ph.D. projects hosted at The American College of Greece Research Center (ACG-RC) can be found below.

| **Position 1**: **ISLANDS Doctoral Candidate ACG-RC-1** |
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| **Title**: Shared spectrum access based on ISAC for automotive applications |
| **Scientific context**: Joint radar-communication technology targeting connected and automated mobility (CAM) services. |
| **Objectives**: To develop a spectrum sharing framework intended for vehicular ISAC systems; to design corresponding ISAC schemes for CAM services with (un)licensed spectrum; to evaluate the performance of the proposed techniques in realistic environments, including via OTA experiments. |
| **Expected results**: Spectrum sharing policies with constrained QoS; ISAC schemes for unlicensed / shared license bands; OTA prototypes and experiments. |
| **Acquired knowledge**: Shared spectrum regulation and communication, ISAC technology, wireless testbed prototyping and experimentation. |
| **Planned secondment(s)**: Orange (Paris, France) [3 months]: investigation of use-cases and KPI related to ISAC in automotive applications; OTE (Athens, Greece) [3 months]: study of the regulatory framework and support for ISAC in vehicular environments at European level. |
| **Ph.D. enrolment**: University of Cyprus |

**The Role of ACG-RC-1**

Doctoral Candidate ACG-RC-1 will explore ISAC techniques for automotive applications in unlicensed spectrum bands, by use of advanced spectrum sharing techniques. The research will target the development and analysis of physical layer ISAC techniques in unlicensed bands that are available for vehicular applications, and the prototyping of at least one of the developed techniques and corresponding over-the-air (OTA) experimentation. Through the planned research visits ("secondments"), the doctoral candidate will also propose relevant use-cases and KPIs for ISAC in vehicular environments (3-month secondment at Orange) and will investigate the need for regulatory support of ISAC at European Union level (3-month secondment at the Hellenic Telecommunications Organisation – OTE).

| **Position 2**: **ISLANDS Doctoral Candidate ACG-RC-2** |
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| **Title**: Resource allocation for ISAC-enabled vehicular networks and system-level performance analysis. |
| **Scientific context**: Joint radar-communication technology targeting connected and automated mobility (CAM) services and networks. |
| **Objectives**: To develop novel resource allocation schemes for ISAC in vehicular environments; to analyse their performance at system level, e.g. using stochastic geometry; to study their realistic behaviour via a system-level software simulator. |
| **Expected results:** New resource allocation schemes for vehicular ISAC networks; system-level performance analysis; system-level simulator development / configuration and simulations. |
| **Acquired knowledge**: Resource allocation for mobile ISAC networks; theoretical and practical system-level performance analysis of ISAC networks. |
| **Planned secondment(s)**: Nokia (Stuttgart, Germany) [3 months]: development of resource allocation techniques that incorporate industry-imposed system constraints; University of Cyprus (Nicosia, Cyprus) [3 months]: theoretical analysis of system-level performance of the developed resource allocation techniques. |
| **Ph.D. enrolment**: University of Cyprus |

**The Role of ACG-RC-2**

Doctoral candidate ACG-RC-2 will study the problem of resource allocation in automotive setups of multiple vehicles equipped with ISAC devices. The frequency (spectrum), power, antenna (spatial degrees of freedom) and time resources will be allocated, taking into account the dual and joint communication / sensing functionalities and their requirements, aiming at the optimization of relevant performance metrics, including joint ones. Another important part of the work will target the performance analysis of the developed schemes. This will happen via both analytical tools such as stochastic geometry, and realistic system-level simulations that will be built on an available open-source wireless network simulator and will capture both mobility and communication / sensing functions in chosen automotive scenarios. Through the planned research visits ("secondments"), the doctoral candidate will also adjust the developed resource allocation techniques to incorporate industry-imposed system constraints (3-month secondment at Nokia Germany) and refine the developed analytical performance analysis techniques by collaborating with the well-established IRIDA Research Centre for Communication Technologies, under the guidance of the Centre Director, Professor Ioannis Krikidis (3-month secondment at the University of Cyprus).

**The following apply to both positions outlined above:**

**Duties and Responsibilities**

1. Undertake postgraduate research in support of the agreed doctoral research project.
2. Work closely with the academic supervisors to ensure the compatibility of the individual project with the overall goals of ISLANDS.
3. Present and publish research in both academic and non-academic audiences.
4. Attend and participate to academic and non-academic conferences, events and seminars.
5. Attend and participate to all training events and supervisory meetings.
6. Be seconded to other network partners as necessary to fulfil the grant obligations.
7. Prepare progress reports and similar documents on research for funding bodies, as required.
8. Contribute to the delivery and management of the wider programme, including attending and participating in programme committee meetings.
9. Actively contribute to the public engagement and outreach activities as described in the grant agreement. As job descriptions cannot be exhaustive, the DC may be required to undertake other duties, which are broadly in line with the above duties and responsibilities.

**Person Specifications**

1. An undergraduate degree and a postgraduate Master's degree (or equivalent) in electronic or electrical engineering, mathematics, electromagnetics, or a physical sciences subject.
2. Excellent mathematical skills and background.
3. High proficiency in Matlab, Mathematica, Maple, R, or similar programming software.
4. Solid background on wireless communications / networks, as follows:
   **Position ACG-RC-1**: Physical-layer design, baseband signal processing, basics of antennas and propagation. Experience in spectrum sharing and over-the-air experimentation is a plus.
   **Position ACG-RC-2**: Resource allocation, MAC layer design, basics of antennas and propagation. Experience in stochastic geometry and large-scale simulation is a plus.
5. Excellent written and verbal communication, including presentation skills.
6. Highly proficient English language skills.
7. Excellent organisational skills, attention to detail and the ability to meet deadlines.
8. Ability to think logically, create solutions and make informed decisions.
9. Willingness to work collaboratively in a research environment.
10. A strong commitment to his/her own continuous professional development.
11. Willingness to travel and work across Europe.

**Eligibility Requirements**

All candidates must meet the following requirements to be considered for these posts:

a) Doctoral Candidates (DC) must not have a doctoral degree at the date of the recruitment by the host organisation. A postgraduate Master's degree (or equivalent) is required at the time of recruitment to enrol in the doctoral program.

b) At the time of recruitment by the host organisation, DCs must not have resided or carried out their main activity (work, studies, etc.) in the country of their host organisation for more than 12 months in the three years immediately prior to the recruitment date. Compulsory national service, short stays such as holidays, and time spent as part of a procedure for obtaining refugee status under the Geneva Convention, are not taken into account.

**How to Apply**

Applications must be submitted, to the attention of Dr. Constantinos Papadias (cpapadias@acg.edu), mentioning the position for which they wish to apply, according to the following procedure:

1) Registration and submission of the application material to the ISLANDS recruitment website: https://www.islands-mscadoctoralnetwork.eu/jobs/
2) Parallel application and submission of the application material at the ACG-RC website: https://www.acg.edu/about-acg/the-american-college-of-greece-research-center/job-openings-acgrc/

*Please note that it is essential that the candidate makes a double submission of his/her application by executing both the above steps 1) and 2).*

Note 1: Informal enquiries for further information about the positions can be sent to Dr. Constantinos Papadias, e-mail: cpapadias@acg.edu.

Note 2: By registering in the website mentioned above, the applicants agree that all members of the ISLANDS project can access their personal data and application material.

Each application must include the following material:

a) A cover letter explaining the motivation for applying for the post.
b) A curriculum vitae setting out the educational qualifications as well as any additional scientific achievements and publications.
c) Evidence of English proficiency.
d) Copy of Bachelor's and Master's certificates (if available at the time of application).
e) Copy of Bachelor's and Master's transcripts.

f) Any additional material useful for the assessment of the candidate (e.g., recommendation letters, research project/statement in agreement with the requirements specified in previous text).

**Selection Process**

The selection and recruitment processes of the DCs will be in accordance with the European Charter and Code of Conduct for the Recruitment of Researchers. The recruitment process will be open, transparent, impartial, equitable, and merit-based. There will be no overt/covert discrimination based on race, gender, sexual orientation, religion or belief, disability or age.

To this end, the following selection criteria for the recruitment of the DCs will be considered:

1. Curriculum vitae
2. Academic performance (diplomas, university transcripts, etc.)
3. Research and industrial experience
4. Awards and fellowships
5. Publications and patents
6. Research, leadership, and creativity potential
7. English knowledge
8. Other relevant items based on the specific candidate

The recruitment process will adhere to the guidelines described in the Grant Agreement of the ISLANDS project. At the network's level, the recruitment will be coordinated by the Recruitment Committee of the project in order to guarantee gender- and sector-balance.

At the American College of Greece Research Center, the recruitment will be coordinated by the Office of Human Resources. More precisely, the recruitment and selection of the DCs will be executed by Ms. Niky Bardanis (hr2@acg.edu). The entire process will be overseen and approved by the Recruiting Committee of the ISLANDS Doctoral Network.

The application deadline for the posts is **April 30, 2024**. Each application will be acknowledged electronically (e.g., by return email) and a unique ID number will be assigned to it.
The applications will be analysed after the application deadline, and the shortlisted candidates will be invited to a teleconference interview. The selected candidates are expected to be recruited during the course of the current year (2024). At the end of the selection process, all the applicants will be informed of the outcome of their application by return email.

**Further Information**

For more information about these positions, please contact Dr. Constantinos Papadias at cpapadias@acg.edu.

**Disclaimer**

By applying for these positions, the applicants give their consent to circulate their application and personal data within the members of the consortium.

By applying for these positions, the applicants declare to fulfil the eligibility requirements defined by the MSCA.

By applying for these positions, the applicants agree that they will comply with the secondment plan. By applying for these positions, the applicants agree that they will comply with the planned Ph.D. enrolment.