A glimpse into the Arctic future: equipping a unique natural experiment for next-generation ecosystem research

PhD student - Early Stage Researcher (ESR9)
Fast prototyping platform to enable sensor communication technology

About FutureArctic

The EU-funded Innovative Training Network FutureArctic aims to quantify how much carbon will escape from the Arctic in future climate. How do the multitude of ecosystem processes, driven by plant growth, microbial activities and soil characteristics, interact to determine soil carbon storage capacity? A group of fifteen PhD-students will study the Forhot ecosystem in Iceland, where a natural coincidence has provided us with the exceptional opportunity to actually look into the future.

Given the strong urgency of tackling and managing the climate challenge and the particularly important role herein of (sub)Arctic ecosystems, a rapid assessment of the ecosystem and ambient processes in this natural laboratory is essential. FutureArctic will achieve this challenge by adopting the fast advances made in the field of **machine learning and artificial intelligence** (AI), **unmanned aerial vehicles** (UAV) and (remote) **sensor technology** into **environmental research at the ecosystem scale**, into a new concept of an '**ecosystem-of-things**'.

FutureArctic thus aims to channel an important evolution to automated machine-assisted fundamental environmental research. This is achieved through dedicated training of researchers with profiles at the inter-sectoral edge of computer science, artificial intelligence, environmental and agricultural science, sensor engineering and communication and social sciences. FutureArctic training ensures the **development of unique enviro-technological job profiles**, all with their own specialty, embedded in holistic knowledge on connected high-data throughput ecosystem research, ready for machine-assisted environmental ecosystem science and modelling.

About the host organization

IMEC
imec is the world-leading research and innovation hub in nanoelectronics and digital technologies. The combination of our widely acclaimed leadership in microchip technology and profound software and ICT expertise is what makes us unique. By leveraging our world-class infrastructure and local and global ecosystem of partners across a multitude of industries, we create groundbreaking innovation in application domains such as healthcare, smart cities and mobility, logistics and manufacturing, and energy.

University of Antwerp – imec IDLab Research group
The IDLab research group of imec and the University of Antwerp performs fundamental and applied research on internet technologies and data science. The overall IDLab research areas are machine learning and data mining; semantic intelligence; distributed intelligence for IoT; cloud and big data infrastructures; multimedia coding and delivery; wireless and fixed networking; electromagnetics, RF and high-speed circuits and systems. Within Antwerp, IDLab specifically focuses on wireless networking and distributed intelligence. IDLab has a unique research infrastructure used in numerous national and international collaborations.

Task description

Your PhD project

In this multi-disciplinary research project, you will be part of a team that researches new ways to use remotely sense environmental parameters while being able to remotely control the experiments. The focus of the phd project will be on enhancing fast prototyping platforms enable IoT Sensor communication in a challenging (sub)Arctic environment enabling local sensor communication and data aggregation. Enabling hybrid communication to support local sensor communication, active radio frequency identification and LowPower WAN to support researchers to easily integrate their sensors. Investigating the power supply and energy harvesting options of the sensor communication systems and developing an autonomous system monitoring system to support remote diagnostics.

Secondments

You will embark on secondments to other FutureArctic partners (SVARMI, VSI, DMR, UCPH and UAntwerpen) to couple multiple novel sensor communication technologies. And to optimize fast prototyping platform for technologies/sensors.

Benefits of working in an ITN

- You will be working within our international group of > 25 researchers

- You will get in contact with the other members of this international consortium and will benefit from the joint training platform to develop skills necessary for developing an "ecosystem-of-things".

Profile and requirements

- Applicants must hold a MSc or equivalent in the field of electronics engineering, computer science or related discipline
- Applicants must have a solid knowledge of low power embedded systems and wireless communication.
- Applicants can be of any nationality.
- Applicants must have an ability to understand and express themselves in both written and spoken English to a level that is sufficiently high for them to derive the full benefit from the network training.
- Applicants must be eligible to enrol on a PhD programme at the host institution (or at a designated university in case the host institution is a non-academic organisation).

In addition:

H2020 MSCA Mobility Rule: researchers must not have resided or carried out their main activity (work, studies, etc.) in the country of the host organisation (Belgium) for more than 12 months in the 3 years immediately before the recruitment date. Compulsory national service, short stays such as holidays, and time spent as part of a procedure for obtaining refugee status are not taken into account.

H2020 MSCA eligibility criteria: Early Stage Researchers (ESRs) must, at the date of recruitment by the host organisation, be in the first four years (full-time equivalent research experience) of their research careers and have not been awarded a doctoral degree. Full-Time Equivalent Research Experience is measured from the date when the researcher obtained the degree entitling him/her to embark on a doctorate (either in the country in which the degree was obtained or in the country in which the researcher is recruited, even if a doctorate was never started or envisaged).

Benefits

- You will be employed by the host organisation for 36 months.
- A competitive salary plus allowances. Moreover, funding is available for technical and personal skills training and participation in international research events.
- You will benefit from the designed training programme offered by the host organisation and the consortium.
- You will participate in international secondments to other organisations within the FutureArctic network and in outreach activities targeted at a wide audience.

Please, find additional information in the *Information package for Marie Curie fellows*

Application

Interested candidates are invited to apply for this position through the link below.
https://idlab.recruitee.com/ (instructions for application will appear here soon)

Expected starting date: October 2019

More information and other vacant positions can be found on www.futurearctic.eu

Additional information

For additional information about the research project and this individual position, please contact:

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