



Job Offer - Patrimony of the Royal Military Academy of Belgium
Department of Mechanics/ Unit: Robotics & Autonomous Systems
Research Engineer / Scientist (M/F/X)
iMUGS (integrated Modular Unmanned Ground System) project



Publication: 25 October 2021

Job Description and associated tasks

The Royal Military Academy of Belgium (RMA) is a military institution responsible for the basic academic, military and physical training of future officers and for the continuing advanced training of officers during their active career in the Belgian Defense department (www.rma.ac.be). It is fully recognized as a university, fulfilling the same criteria as civilian universities. The Royal Military Academy is also conducting scientific research at university level for projects funded by the Belgian Defense department or external sources.

In the framework of a research & development iMUGS (integrated Modular Unmanned Ground System) project funded by the European Commission's European Defence Industrial Development Programme (EDIDP) and conducted in collaboration with other major defence, communication and cybersecurity companies and high-tech SME partners, we are looking for a full-time research scientist/engineer with a degree in Applied Sciences / Engineering / Physics / Computer Science / Informatics with experience in Robotics (Unmanned Systems) and/or Artificial Intelligence (AI).

During the project, a modular and scalable architecture for hybrid manned-unmanned systems will be developed to standardize a European-wide ecosystem for aerial and ground platforms, command, control and communication equipment, sensors, payloads, and algorithms. The prototype system will utilize an existing unmanned ground vehicle and a specific list of payloads.

Within iMUGS, the successful candidate will work on the swarming subproject, which has as a goal to provide advancements of swarming technologies in order to expand the capabilities of a unique robot where heterogeneous assets will have the capability to work as a group with a common mission or multiple mission objectives. The developed work should aim to bridge existing practical gaps between theory and implementation of scalable multi-agent collaboration and optimization, which should ensure operations in mission-critical unstructured outdoor environments. In order to execute such complex missions, the challenging existing gaps related to the timely and compact rendering and structuring of data need to be solved.

The successful candidate will have to, in cooperation with his colleagues and partners, develop swarming algorithms and concepts, implement, evaluate their performance and validate them in real and simulated environments. The swarming/autonomy framework should be developed as platform-agnostic, enabling integration to unmanned ground platforms and adaptation to current manned vehicles. The developed framework should furthermore be capable of expedited deployment and interoperable with existing command and control and manned operations. The candidate is also expected to publish the relevant results in the scientific literature and other dissemination channels while taking the industrial valorization of these results into account.

In addition, the successful candidate will also prepare and set up measurement of large-scale demonstrations and test campaigns within a land environment to test and showcase the capabilities of the iMUGS system, with the goal of performing various missions using swarming capabilities in military contexts.

The research engineer / scientist will be a part of the “Robotics & Autonomous Systems (RAS)” Unit of the Department of Mechanics (<https://mecatron.rma.ac.be>) of the Royal Military Academy.

The duration of the funding for this position is tied to the iMUGS project, which ends in May 2023. The cooperation may be extended if we are able to secure follow-up funding.

Main tasks

Performing the tasks of the iMUGS project allocated to the Royal Military Academy:

- Develop & implement architectures, methods and algorithms to optimize a swarming multi-agent system against multiple objectives, map possible concepts of swarm operation and identify possible strategies;
- Coordinate and develop real-time centralized swarming capabilities for collaborative robotic behavior and rapid rescheduling and re-tasking of robots (unmanned systems);
- Design, develop, code and integrate swarming capabilities/algorithms aiming to operate multiple robots (unmanned systems) by a single operator (within real and simulated environments);
- Define and develop a test bench for evaluation of the developed capabilities and algorithms;
- Develop a testing, verification and demonstrations within realistic environments of the implemented designs and joint integrations with other partners;
- Report the progress results, document operational procedures and best practices to the other members of the consortium and in the scientific literature, in English;
- Report the obtained results at international conferences and write scientific papers in English;
- Participate in identification of new research directions, collaborations with research and industrial partners, writing research/project proposals as a collaborator of the RMA – RAS team.

Required skills

Technical skills

- The applicant shall have a Master degree in Applied Sciences / Engineering / Physics / Computer Science / Informatics with experience in the field of Robotics or AI;
- Excellent knowledge of a programming language (e.g. C++, Python...) is required;
- Experience in developing autonomy and optimization algorithms including AI for Robotics (Unmanned Systems) is highly recommended;
- Experience in integrating and developing components in the field of Robotics (Unmanned Systems) is highly recommended.
- Knowledge of ROS and robotics simulation environments (e.g. Gazebo...) is recommended;
- Very good understanding of Linux system and open-source development environments is recommended;

Personal skills

The applicant shall

- be able to work independently in a multidisciplinary team;
- be able to work well in a team.

Other skills

The applicant shall

- have excellent written/oral scientific communication skills in English;
- oral communication skills in French or Dutch are an added asset.

Specific requirements

The successful candidate has to be committed to confidentiality and exclusivity and will therefore have to obtain the required security clearance. The candidate must consent with the background check required to obtain this clearance, which will be executed by the Belgian Defense. Taking into account the confidential nature of the provided information within the work, absolute discretion is to be demonstrated. **This position is only open for EU member states citizens.**

Application

The work is to be performed in a military context and that implies that the candidate will undergo a background check. The application must be accompanied by the filled in document that can be downloaded at <http://www.rma.ac.be/nl/aanvraag-veiligheidsverificatie>

Applicants shall send

- a motivation letter;
- a complete CV;
- a scan of the highest diploma;
- a copy of their ID card (front and back);
- the request for background check (see above),

referring the subject “**MECA iMUGS project**” to Dr. Ir. Geert De Cubber (geert.decubber@mil.be), Dr. Ir. Emile Le Flécher (emile.leflecher@mil.be) and Ir. Alexandre La Grappe (alexandre.lagrappe-dominicus@mil.be) and to Helena BRUYNINCKX (ERM-deao-rswo@mil.be).

The application deadline is November 30th 2021.

A first pre-selection will be conducted based on the received documents. Preselected applicants meeting the requirements will be invited to a face-to-face interview (optional online; depending on the COVID-19 situation) at the Royal Military Academy, rue Hobbema 8, 1000 Brussels.

Additional information

Contract

- The candidate will be hired ASAP (in consultation with the applicant);
- The candidate will be offered a full-time open-ended contract with the patrimony of the Royal Military Academy. This does not imply that the candidate will be a civil servant;
- Wage scale: A11 (holders of a Master degree) or A21 (holders of an Engineering degree);
- Holiday allocation.

Extra-legal benefits

- Possibility of receiving a bilingualism allowance (Dutch/French) following a SELOR test;
- End-of-year bonus;
- Free DKV hospitalization insurance. Possibility of additional affiliation for one or more persons living under the same roof: spouse, child(ren) (50% of the price per additional member);
- Bicycle allowance / Free public transport (home-work commute);
- Free access to campus sports facilities outside working hours;
- On-campus restaurant and cafeteria with democratic prices (discount on the daily menu);
- Flexible working hours within the 38-hour week;
- Teleworking possible after 1 year of service at the latest;
- Additional holiday for all staff between Christmas and New Year;
- 26 days holiday / year (then from 45 years: +1 day holiday every 5 years) from the 1st year of contract + 3 days / year dispensation from service offered by the department;
- Advantages and interesting offers thanks to the Benefits@work card (discounts, vouchers...);
- Entitlement to services offered by the 'Office Central d'Action Sociale et Culturelle de la Défense' (OCASC): among others holiday centres, discount on travel organised by the tour operator...;
- Possibility of benefiting from the nursery funded by Belgian Defence (subject to availability).

Workplace

- Royal Military Academy - Avenue de la Renaissance 30, 1000 Bruxelles;
- Field tests will need to be executed at the testing premises (within Belgium these tests will be executed in Marche-en-Famenne, but there will also be field tests in Germany and France);
- Occasional professional trips abroad;
- Meetings at partners' premises.