



## Job offer Royal Military Academy - Patrimony



### **Researcher (M/F/X) on Robotics Network Architectures** Departement of Mechanics Research engineer network optimisation Publication date: 20/10/2022

#### **Job description and associated tasks**

We are looking for a research engineer to support the implementation of European Commission (EC), European Defence Agency (EDA) and Defence contracts in robotics (software) projects involving international, multi-partner collaboration in applications including ground, air and maritime robotics, including counter-drone systems. The position is in the department of Mechanics in the Robotics & Autonomous Systems (RAS) unit (<https://mecatron.rma.ac.be/>). The candidate will support the RAS unit in the optimization of the network architectures across multiple projects. For this reason, we are looking for a full-time researcher with a master degree in Informatics / Computer Science / Applied Sciences / Engineering and experience in the field of Robotics. We offer an enticing work environment, where you will work in a multi-national team on a mix of European and Belgian collaborative research projects with real robotic systems and practical applications on the terrain. The Royal Military Academy (RMA) is strongly committed to promoting diversity and gender equality. Therefore, women candidates are strongly encouraged to apply.

#### Context:

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](http://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.

You work within the multi-national research cell 'Robotics & Autonomous Systems' (<https://mecatron.rma.ac.be/>) of the department of Mechanical Engineering of the Royal Military Academy and together with several large consortia of research institutes and companies in the context of collaborative European research projects. You conduct scientific research at university level.

#### Study:

Robotic & autonomous systems, be it on land, in the air or at sea, more and more leave the protected lab environment and become able to perform operations in complex outdoor environments. This also means that these robotic systems need to communicate & collaborate between themselves and with existing infrastructure to exchange data and to act as a multi-agent swarm towards a higher common goal. One could say that the robotic assets become edge devices in an Internet-of-Things framework and are required to exchange information with fog & cloud services. Due to the heterogeneity of software architectures, data exchange protocols, network infrastructure and due to restrictions related to the different domains (land, air, sea) where the robotic agents operate, this leads to a wide range of interoperability problems that need to be solved to enable multi-agent collaboration.

## Main Tasks

The main task of the candidate will be to support the RAS team across multiple projects that all deal with multi-agent systems in order to solve questions related to interoperability, more specifically:

- Leading network and system architectures definition, interfaces design and managing integrations across projects (main working environment Linux; sporadically Windows)
- Leading network configuration for multi-agent robotic systems or sensor networks.
- Leading optimal network design & implementation.
- Developing strategies for optimal resource allocation of services across edge, fog & cloud appliances
- Supporting the team with code optimization and management
- Supporting the implementation of project-specific software
- Interacting closely with the technical leads (and occasionally acting as technical lead, depending on projects and work scope)
- Ensuring the timely release and delivery of projects, with required quality level
- Producing required documentation.

## Required skills

### Technical skills

The applicant shall have a master degree. This is a multi-disciplinary study, requiring a mix of theoretical skills (conception of novel architectural designs) and more practical skills (implementation and field validation of architectural designs on unmanned systems).

- Training or experience in network design is required. Knowledge on Ethernet & wireless networking, TCP & UDP protocols, DHCP & IP configuration, etc;
- Experience in programming is required;
- Experience in the implementation of Internet of Things frameworks is required;
- Knowledge of software engineering life cycles, Agile methodologies and Scrum experience is recommended
- Training or experience in robotics & AI is recommended;
- Hands-on experience with Continuous Integration processes and agile software development is recommended
- Experience with complex software architectures assemblies, deployment and testing (e.g. Docker) is recommended
- Knowledge of ROS (<https://www.ros.org/>) is recommended;
- Proficiency in technical documents production is recommended
- Training or experience in signal processing is an added value;
- Training or experience in Control Engineering is an added value;
- Training or experience in Sensor integration is an added value;
- Knowledge of deep learning algorithms is an added value.
- Training or experience in applied research and or design is an added value;
- Knowledge of UML is an added value
- Previous experience with EC / EDA project management is an added value for the position

## Personal skills

- You conduct scientific research in an independent and upright way within a multidisciplinary environment
- You think in an innovative and creative way. You take initiative, you are involved and result oriented.
- You communicate your results in a clear, concise and precise manner.
- You are honest, loyal toward the institution and respect confidentiality.
- You plan and manage proactively your self-development, while being critical to your own functioning and striving to your self-improvement.
- You improve the team-spirit and solve interpersonal conflicts. You are flexible for change and adapt yourself.
- You solve problems autonomously and find alternatives or solutions.
- You behave in a respectful way toward the others, their ideas and opinions as well as toward procedures.
- You are capable of writing qualitative technical reports on your work
- You are capable to manage, direct and assist with the composition of deliverables towards the funding authority
- You are capable to write and present scientific papers about your work

## Other skills

- The applicant shall have excellent oral & written knowledge of English.
- Minimum knowledge of Dutch or French is an added value for collaboration with peers.

## Application

You will be working in a military environment. That is why everyone is expected to undergo a security verification. Please add to your application the filled out document. The form can be downloaded from: <http://www.rma.ac.be/nl/aanvraag-veiligheidsverificatie>

Send by email to Mr Geert De Cubber ([geert.decubber@mil.be](mailto:geert.decubber@mil.be)) and to Mrs Helena BRUYNINCKX ([erm-deao-rsw@mil.be](mailto:erm-deao-rsw@mil.be)):

- a motivational letter;
- a CV
- a scan of your ID card (both sides);
- the filled out security document

Please mention clearly the reference of the vacancy: "Network Engineer".

Application deadline: 30/11/2022.

Note that the RAS unit is opening up simultaneously four different positions (Maritime Robotics, Ground Robotics, Network Engineer, Optimization & AI Engineer). Please choose the position that matches best your skills and apply only for that one, in order to avoid administrative overhead. If you think that your profile could also suit the other profiles, then you can mention this in the motivation letter and we will fully consider this when performing the candidate selection.

The interviews will take place at the Royal Military Academy, Hobbemastraat 8, 1000 Brussels. In case of access restriction due to COVID-19 or non-Belgian application, on-line interviews will take place. The date and time of the interview will be communicated to the preselected candidates.

## Miscellaneous

### Contract

- Probable date of recruitment: 01/01/2023, in consultation with the applicant.
- Status: Full-time employment based on an open-ended contract with the Patrimony of the Royal Military Academy (you will not be a civil servant). Please do note that – while the contract is open-ended – the financing is secured only until 31/12/2024 (so, a 2-year period). An extension is possible subject to the availability of funding.
- Wage scale: class A1 (holders of a Master's degree in Science) / class A2 (Ir ; holders of a Master's degree in Engineering). RMA applies a merit-based research career track, allowing researchers to advance in wage scale based upon annual evaluations.
- Holiday pay.

### Extra-legal benefits

- Possibility to benefit from 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);
- Bike 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 Brussels;
- Occasional travel abroad for scientific conferences, etc.

### Points of contact

- Concerning the research project: to Mr Geert De Cubber ([geert.decubber@mil.be](mailto:geert.decubber@mil.be))
- Concerning the recruitment modalities: Mrs Helena Bruyninckx ([erm-deao-rsw@mil.be](mailto:erm-deao-rsw@mil.be))
- For more information about:
  - the Royal Military Academy, see <http://www.rma.ac.be>
  - the research cell 'Robotics & Autonomous Systems', see <https://meatron.rma.ac.be/>