

**Jobdescription: Research scientist/engineer (M/F) for the Royal Military Academy, Department Communication, Information, Systems & Sensors (CISS)
DAP 18/05 ('Automation of Ship-Based Intelligence Gathering')**

Publication date : 08 May 2019

1. Job description and associated tasks

In the framework of a research project financed by the Belgian Defence, we are looking for a research scientist/engineer with a master's degree in Mathematics, Physics, Computer Science or Electrical Engineering (Applied Sciences, Engineering Sciences).

The specific research context for this project is defined by naval intelligence gathering. We believe it is possible to expand this role of the Belgian Navy, automating the fusion of ship sensor data with human intelligence, to generate reports on ship identity and signature, detected changes, and ship activity and behaviour.

For this we propose to prototype a ship signature database which continuously integrates thermal and visual data from the patrol vessel's sensors through a machine learning process, informed by human intelligence and AIS ground truth data. The system will automate ship identification, and the subsequent detection of configuration changes and anomalous behaviour in the observed ship.

This will improve data gathering in the absence of sensor specialists or analysts on board, and significantly increase the response time of the intelligence community to anomalous events.

The expected research outcome of this project can be evaluated at different levels. We expect this project to provide:

- a set of image processing tools allowing for automated extraction of features assisting in classification and identification of ships using the ships visual and thermal sensors
- a demonstrator of a deep learning ship signature database
- a demonstrator of a ship classifier, based upon that ship signature database
- a demonstrator of an automated intelligence report generator, fusing multiple features

2. Required skills	
Technical skills:	<ul style="list-style-type: none"> • The applicant shall have a master's degree in Mathematics, Physics, Computer Science or Electrical Engineering (Applied Sciences, Engineering Sciences). • Good knowledge of statistics • Knowledge of pattern recognition • Good programming skills • Knowledge of one or more of following programming languages: Matlab, Python, C++, Julia, Fortran • Basic knowledge of IT infrastructure and databases • Experience in machine learning or image processing is a plus. • Knowledge of platforms such as Tensorflow, Caffe en MXN is an added value.
Specific requirement:	<ul style="list-style-type: none"> • The researcher will be exposed to classified information 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 Defence.
Personal skills:	<ul style="list-style-type: none"> • Ability to conduct scientific research at university level • Ability to work independently and in a multidisciplinary research team • Ability to solve software problems independently and using logical reasoning • Excellent written communication skills, both for scientific communications and for general public communications • Good oral communication skills for scientific communications • Flexibility • Critical and creative mentality
Experience, other skills:	<ul style="list-style-type: none"> • The applicant shall have an excellent command of the English language (to read and write scientific publications).

3. Application	
<p>There will be an interview (+/- 30 Min) in relation with the task and skills described here above</p> <ul style="list-style-type: none"> • Send a motivation letter, a CV and a scan of your ID card (both sides) to Ms. Marijke Vandewal (marijke.vandewal@rma.ac.be) and to Mr. Thierry Deprez Thierry.Deprez1@rma.ac.be • Please mention clearly the reference of the project: DAP 18/05 • Application deadline: 21 June 2019 • The interviews will take place at the Royal Military Academy, Hobbemastraat 8, 1000 Brussels. 	

4. Miscellaneous	
Contact points	<ul style="list-style-type: none"> • Concerning the research project: Ms. M. Vandewal (marijke.vandewal@rma.ac.be) • Concerning the recruitment modalities: Mr. Thierry Deprez Thierry.Deprez1@rma.ac.be • For more information about the Royal Military Academy, see http://www.rma.ac.be and for the SIC, http://www.sic.rma.ac.be/
Others	<ul style="list-style-type: none"> • Probable date of recruitment: 19 August 2019 (to be agreed with the applicant). • Status: Open-ended contract with the Patrimony of the Royal Military Academy (you will not be a civil servant). • Wage scale: A11 (holders of a Master's degree in Science) / A21 (Ir or holders of a Master's degree in Engineering) • Extra-legal benefits: <ul style="list-style-type: none"> • Possibility to obtain a bonus for bilingualism (Dutch/French); • Holiday allocation; • End-of-year bonus; • Hospitalisation insurance; • Free public transport (home-work commute); • Free access to the on-campus sport infrastructure; • On-campus restaurant and cafeteria. <p>Workplace: Royal Military Academy, 1000 Brussels, occasional travels abroad, measurement campaigns off campus, meeting at partner's premises.</p>