



Job offer
Royal Military Academy - Patrimony



Research in Finite Element modelling (M/F/X)
Department Weapon Systems and Ballistics
project “AHTAFEM”
Publication: 04th of July 2024

Job description and associated tasks

In the framework of a research project funded by the Belgian Defence, we are looking for a junior research scientist/engineer with a master's degree Mechanical Engineering or Biomechanical Engineering (Applied Sciences, Engineering Sciences).

The Royal Military Academy values diversity and equal opportunities. **We enthusiastically welcome applications from all individuals, regardless of gender, origin, or other personal characteristics.** Whether you are a man, a woman or X, or come from any background, we firmly believe that diversity enriches our community, and we encourage all qualified candidates 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). 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 department of Weapon Systems and Ballistics of the Faculty of Polytechnics of the Royal Military Academy. You conduct scientific research at university level.

Project:

The proposed research study consists in working on the development of a human thorax/abdomen finite element model for the evaluation of Kinetic Energy Non-Lethal Weapons (KENLW) and Behind Armour Blunt Trauma (BABT). KENLW consists in firing soft material, “slow velocity” projectiles in order to incapacitate human targets without causing severe or permanent injuries. BABT is the loading that occurs on the human body when undergoing a ballistic impact on a ballistic protection that stops the projectile.

In practice, Finite Element Models are used to recreate the biomechanical response of human targets when undergoing a KENLW impact or BABT. These models are supposed to be validated thanks to biomechanical data available on the open literature.

Firstly, an initial workload will be assigned concerning the literature study. Parallely, a learning process is envisioned. The geometry generation of the model will then be performed, based on CT-scan and MR imaging. The mesh generation and contact definition will follow. All the gathered results at this stage will allow performing the main effort of the study, which is the material models definition and the validation of the global model. Finally, the model will be used to generate results.

Main Tasks

- Develop a Finite Element model of a 50th percentile human for assessing non penetrative impacts
- Validate the models using data from the literature
- Use the model for assessing non penetrative impacts
- Provide general support to the Departments activities

Required skills

Due to the specific nature of the proposed project, only a very limited set of technical skills are required. Several other skills are identified as added value (not compulsory). Motivation and the potential offered by the candidate will be a key factor.

Technical skills

- The applicant shall have a master's degree in Engineering (Applied Sciences, Engineering Sciences) in the field of Mechanical Engineering or Biomechanical engineering
- The applicant shall have academic (study project and/or master thesis) or professional experience in numerical simulations
- The applicant shall have relevant skills in mechanical engineering and/or biomechanical engineering

Personal skills

- Ability to conduct scientific research at university level
- Ability to work independently and in a multidisciplinary research team
- Excellent written communication skills, both for scientific communications and for general public communications
- Good oral communication skills for scientific communications
- Honesty and loyalty towards the organization
- Solution-oriented

Other skills

- The applicant shall have an excellent command of the English language (to read and write scientific publications).
- Experience in LS-DYNA is a strong added value
- Experience with medical imaging is an added value
- Experience in ballistics is an added value
- Minimal knowledge of French and/or Dutch is recommended (collaboration with peers)
- Experience in scientific literature review and scientific writing is an added value.

Specific requirement

- The researcher can 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.
- The researcher can be exposed to classified information and should be **citizen of a NATO country**.

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> (Dutch) or https://rma.ac.be/sites/default/files/2021-03/Demande%20d%27Avis%20de%20S%C3%A9curit%C3%A9_F.pdf (French).

There is unfortunately no English version of this document.

Send by email:

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

to Mr. Cyril ROBBE (cyril.robbe@dymasec.be) and to Mrs Helena BRUYNINCKX (erm-deao-rsw@mil.be).

Please mention clearly the reference of the project: **"AHTAFEM"**.

Application deadline: **25th of July 2024**.

The interviews will take place preferably at the Royal Military Academy, Hobbemastraat 8, 1000 Brussels. In specific cases, on-line interviews can be organized. The date and time of the interview will be communicated to the preselected candidates.

Miscellaneous

Contract

- Probable date of recruitment: **September 2024**, in consultation with the applicant.
- Status: **Full-time employment (38 hours / week)** based on an **open-ended contract** with the Patrimony of the Royal Military Academy (you will not be a civil servant).
- Wage scale: class A2 (holder of an Ir degree or equivalent Master's in Engineering Sciences, doctor's degree in the same area of expertise).
- 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);
- Meal vouchers (6€/day)
- Flexible working hours within the 38-hour week + Teleworking possible with allowance;
- Holidays:

- 29 days holiday / year from the 1st year of contract (then from 45 years: +1 day holiday every 5 years)
- + 1 week OFF every year between Christmas and New year's Eve
- 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 travels abroad for scientific conferences, etc.

Points of contact

- Concerning the research project: Mr. Cyril ROBBE (cyril.robbe@dymasec.be)
- Concerning the recruitment modalities: Mrs. Helena Bruyninckx (erm-deao-rswo@mil.be)
- For more information about the Royal Military Academy, see <http://www.rma.ac.be>