

## Training Opportunity for Belgian Trainees

Reference	Title	Duty Station
BE-2017-HRE-I	Harwell Robotics and Autonomy facility for exploration missions	ECSAT
<p><b>Overview of the unit's mission:</b>            The HRAF (Harwell Robotics and Autonomy Facility) concept has been initiated at ECSAT to answer the need of development, verification and validation of complex autonomous systems such as planetary rovers and other landed elements, which are critical to enable future planetary exploration missions.            In order to become operational for future exploration missions, HRAF will go through an implementation phase whose timing and process is currently under definition. This process is likely to start after pilot 2 completion in 2018, such that it is synced with possible Mars Sample Return rover applications (Sample Fetch Rover).</p>		
<p><b>Overview of the field of activity proposed:</b>            The present position aims at taking part to the pilot 2 and make the link with the follow on implementation of HRAF. A first step will be a part-time placement in the pilot 2 industrial team led by RAL space on the Harwell campus followed in a second step to a support to the implementation and use of HRAF for the Exploration program.            In particular the following points will be addressed:</p> <p>(a) HRAF Pilot 2 development support</p> <ul style="list-style-type: none"> <li>• Software development for the baseline HRAF dynamic archive (led by STFC scientific computing, <a href="https://icatproject.org/">https://icatproject.org/</a>)</li> <li>• Software development for the connection of the HRAF dynamic archive to the core HRAF infrastructure using HLA (High Level Architecture).</li> <li>• Participation to some integration activity and/or field trials</li> </ul> <p>(b) Support to the HRAF implementation and utilization</p> <ul style="list-style-type: none"> <li>• Use the operational system delivered at the end of Pilot 2 to perform modeling/simulation and archiving for the next ExpeRT technology development activities related to the Sample Fetch Rover, in particular SPRINTER (<i>System PRototyping and INtegrated Testing in Environment Representative of SFR</i>) and PELORUS (<i>Planetary Explorer LOCALISATION-navigation Ready for Use</i>).</li> <li>• Focus point of HRAF for the spaceship ECSAT (following a similar concept than the one developed at EAC, <a href="http://www.esa.int/About_Us/EAC/Networking_Partnering_Initiative">http://www.esa.int/About_Us/EAC/Networking_Partnering_Initiative</a>)</li> </ul> <p>(c) Support to the HRAF pilot 3 (TBC)</p> <ul style="list-style-type: none"> <li>• Review of documentation as expert (following experience developed on Pilot 2) to insure consistency with pilot 2</li> <li>• Potential software development in parallel to the activity (content TBD but could be related to use of SysML)</li> </ul>		
<p><b>Required education:</b> Applicants shall have completed their engineering degree in the field of computer science with focus on robotics, autonomy, image processing (for stereo vision, digital elevation map...). Knowledge and experience with XML, Java, C++ and database are a pre-requisite. Participation to actual robotic (in particular rover) projects development is clearly an asset. A very good understanding of distributed simulation architecture and technology as well as system engineering practices (with experience related to SysML) is important.</p>		