

Project proposal template – Faculty studentships Summer 2014

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<i>Project title</i>	<input style="width: 95%;" type="text" value="Emergency unmanned composite vehicles for the exploration of unknown environments"/>	<i>Director of Study</i>	<input style="width: 95%;" type="text" value="Dr Hessam Ghasemnejad"/>
<i>Second Supervisor</i>	<input style="width: 95%;" type="text" value="Dr Olga Duran"/>	<i>School</i>	<input style="width: 95%;" type="text" value="Aerospace and Aircr"/>
<i>Other members of supervisory team</i>	<input style="width: 95%;" type="text"/>	<i>Any requirements from applicant (eg degree in specific subject area)</i>	<input style="width: 95%;" type="text"/>
Project summary (max 1,000 characters)			
<p>Unmanned Vehicles (UAVs and UGVs) are becoming more accessible and can be seen nowadays in many applications. In this project, we propose to explore the use of unmanned vehicles for emergency scene exploration of locations not accessible or dangerous for humans (i.e. after extreme weather and climate events). The project, interdisciplinary in nature, will deal with the design and implementation of the vehicle. On the design side, composite materials will be explored to introduce ways of structural integrity, overall structural stiffness, strength, and light weight, low cost and environmental friendly. For the implementation, the vehicle needs to be capable of self localisation and fully automated navigation in the absence of external information. Simultaneous Localisation and Mapping (SLaM) algorithms are commonly used for this purpose with the help of large and high cost sensors. Here, low cost depth sensors such as Microsoft Kinect in combination with novel processing methodologies will be explored to reduce the cost implications of SLaM.</p>			