



<b>SUPERVISOR INFORMATION</b>	
First and Last name	Elsa Caetano
URL of supervisor webpage	<a href="https://sigarra.up.pt/feup/en/func_geral.formview?p_codigo=211263">https://sigarra.up.pt/feup/en/func_geral.formview?p_codigo=211263</a>
Department	Civi and Georesources Engineering
Field(s) of research	Structural Dynamics; Vibrations; Damage detection ; Automation; Robotics; Video processing
<b>PROJECT PROPOSAL;</b>	
Title (optional)	Robots and Vision Systems for Condition Assessment of Tensioned Cables
Brief project description	
<p>Cable structures, including cable-stayed, suspension bridges and suspended roofs, rely on the use of tensioned cables as the supporting system. The flexibility and typical low damping of such structural components makes them prone to vibrations induced by the wind and traffic. Combined with harsh exposure to the elements, such structural elements often degrade at higher than expected rate, requiring frequent inspection and assessment of installed tension as a measure of their operational capacity.</p> <p>The use of robots for such inspection has been made using climbing robots fitted with video cameras, but this strategy has been used mostly for visual inspection.</p> <p>The present proposal aims at using the robotic system and camera as a sensor, eventually with capacity to apply loads, but also to use localisation for precise characterisation of the instrumented sections, enabling identification of mode shapes and other cable parameters relevant to characterize the corresponding condition.</p> <p>The proposal covers a wide range of expertise, namely regarding automation and robotics, vision processing, and civil engineering, and has ample applications offering a very innovative approach in the assessment of cable structures.</p>	