SUPERVISOR INFORMATION	
First and Last name	Filipe Neves dos Santos
URL of supervisor webpage	https://sigarra.up.pt/feup/pt/func_geral.formview?p_codigo=426556
Department	Department of Electrical and Computer Engineering
Field(s) of research	Robotics and IoT
PROJECT PROPOSAL	
Title (optional)	Phenotyping Robot for Sustainable Management of Permanent Woody Crops

Brief project description

Remote sensing has revolutionized precision agriculture by enabling data-driven decision-making. However, its effectiveness is often limited by coarse spatial resolution and by the constraints of emerging production systems such as agrivoltaics and controlled-environment agriculture. These contexts demand high-resolution, proximal phenotyping, which remains a labor-intensive and time-consuming task when conducted manually. This project aims to develop and validate robotic solutions for autonomous proximal phenotyping, enhancing the Modular-E robotic platform from INESC TEC with manipulation and spectral sensing modules. The research will focus on achieving robust, all-weather operation and safe interaction with soft and moving plant tissues in open-field conditions.

The expected outcome is a new generation of adaptive robotic phenotyping systems capable of delivering high-resolution, real-time plant and canopy data, bridging the gap between field robotics and digital crop intelligence to support sustainable and precise management of permanent crops.