Giorgio Impollonia

AGRI SYSTEM
Scuola di Dottorato
per il Sistema Agroalimentare
UNIVERSITÀ CATTOLICA del Sacro Cuore

KEY-WORDS:
REMOTE SENSING - UAV - PHENOTYPING - PROSAIL - MACHINE LEARNING

PROFILE

I am a third-year PhD student in Sustainable Crop production. I work in Remote Sensing for Precision Agriculture and High-throughput Phenotyping. My research field is at the interface between GIScience and Remote Sensing.

AFFILIATION

Department of Sustainable Crop Production (DI.PRO.VE.S)

Centro Ricerca Analisi geoSpaziale e Telerilevamento (CRAST)
Università Cattolica del Sacro Cuore

LANGUAGES

Mother language

Level B1

Level B1

SOFTWARE

HOW TO REACH ME

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Reference Contact

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PROJECT TITLE
Application of high-resolution UAV imagery to estimate biophysical parameters for field-phenotyping

Steps of the research
- Application of UAV multispectral remote sensing for the estimation of biophysical parameters used in field phenotyping of hemp and miscanthus.
- Evaluation of biophysical parameters as leaf area index (LAI), chlorophyll content, moisture content and biomass.
- Application of Machine Learning (ML) analysis and inversion of the canopy Radiative Transfer Model (RTM) to estimate biophysical parameters.

Main Results
ML and inversion of the canopy RTM through multispectral UAV imagery can estimate biophysical parameters of the crops.

Research Contribution
Biophysical parameters estimation by UAV can characterize the growth and senescence dynamics of diverse genotypes. Furthermore, evaluating the time series of these biophysical parameters can help in the selection of genotypes that are better adapted to present and future climate conditions.

Collaborations
Institute of Biological, Environmental and Rural Sciences, Aberystwyth University, Aberystwyth, UK
Prof. John Clifton-Brown

Why should you care?
The crop phenotype derives from the interactions between the crops genes and environmental factors and can be evaluated by the analysis of the time series of biophysical parameters estimated through UAV. Phenotyping by UAV allows fast, large scale and non-destructive screening and can help plant breeders to select the best genotypes.