

International Doctorate in Civil and Environmental Engineering

DOCTORAL COURSE

High resolution digitisation techniques: laser scanning and photogrammetry

Teacher: Dott.ssa **Valentina Bonora**

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Calendar	
29/06/2020, 09,30-13,30 – online course	High resolution spatial data – introduction and field of application. Laser scanning technique. Measurement principles of different instruments. Sensors integration and mobile mapping systems. SLAM-based Mobile Mapping. Management of massive amounts of data. Accuracy assessment.
03/07/2020, 09,30-13,30 – online course	Geometrical and analytical principles of photogrammetry. Photogrammetry as a fast-moving science: the digital revolution. Structure from Motion: algorithms able to substitute skilled operators. Drones for images (and more) acquisition. Geo-referencing and focus on metrological aspects.
06/07/2020, 09,30-13,30 and 14,30-16,30 – online course	Practical experience (personal laptop is required).
Total	14 hours – 7 credits

Program
<p>Research projects are frequently based on spatially referenced data, and the information that is produced and/or assessed are spatially related as well. The course is aimed at PhD candidates interested in spatial data, specifically focusing on high-resolution digitization techniques, like laser scanning and digital photogrammetry. Both methods can be applied regardless of the scale of analysis, i.e. they can lead to the digitization of entire regions and extensive infrastructure, or of specific artefacts, up to studies at the macro scale. Obviously, the techniques must be appropriately adapted to the context and the instruments adopted must be adequately identified. A digitization project always requires to be planned with a project by project method; only a correct metrological approach allows to derive correct and accurate information from the resulting datasets, supporting thus further analysis in many different scientific fields.</p>