2020 IMEKO TC-4 INTERNATIONAL CONFERENCE ON

METROLOGY FOR ARCHAEOLOGY AND CULTURAL HERITAGE

TRENTO, ITALY | OCTOBER 22-24, 2020

CALL FOR PAPERS *for the Special Session on*

# SEMANTIC SEGMENTATION OF POINT CLOUDS IN CULTURAL HERITAGE

ABSTRACT

The use of 3D point clouds for Cultural Heritage (CH) assets is becoming paramount, since they allow metric & morphological analyses, better interpretation of phenomena, valorisation & visualisation, innovative management & development of conservation strategies - all processes which would be very difficult using just 2D data. However, despite the large availability of 3D point clouds, the complexity of CH assets makes the exploitation of these 3D data very impervious. Moreover the provision of massive 3D geometric information with only color attributes is often hampering their full exploitation due to the lack of semantic information. Therefore the need of efficient, reliable and automated solutions for heritage point cloud classification is necessary in order to widespread the use of such kind of data among heritage conservators, restorators, managers and HBIM experts.

Towards this end, the development of automated Machine Learning frameworks for point clouds classification is filling this gap, proving to be a very promising, but complex, field of research. These frameworks are designed to semantically enrich point clouds based on some specific classes, quite often case-dependent. These frameworks may facilitate the recognition of historic architectural elements at an appropriate level of detail, thus speeding up the process of reconstruction of geometries in the HBIM environment, or they can automatically identify degraded areas to speed up restoration process, etc.

The special session seeks contributions presenting modern Machine & Deep Learning methods applied to heritage 3D data in order to semantically enrich them. The session will try to tackle also topics like geometric features, clustering, multi-resolution, hyper-parametrisation, optimisation, available software/tools, etc.

The intended audience are academics, graduate students, researchers and Cultural Heritage domain-experts who are interested in the state-of-the-art techniques for semantic segmentation of point clouds acquired with photogrammetry or laser scanning.

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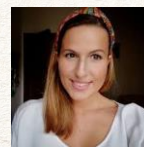
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SPECIAL SESSION #13

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