

# Monitoring and Analysis of 3D Models Using Deep Learning

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## **Abstract**

This presentation details my activities conducted at the IMATI branch in Genoa. Specifically, my research has focused on developing neural networks for cultural heritage monitoring and analysing 3D models. The monitoring of archaeological artifacts was the main subject of research within the framework of the "Casa delle Tecnologie Emergenti – Opificio Digitale per la Cultura" project. My efforts were concentrated on developing models capable of identifying cracks and deterioration in images of statues and marble objects. Various architectures were trained on the OmniCrack30k dataset, and transfer learning strategies were then adopted to perform inference on cultural heritage images. Other contributions include participation in some SHREC 2025 contests. In this context, I participated in the track "Partial Retrieval Benchmark" co-organized by NUTU Norway, University of Chile and CNR for the creation of a benchmark on the partial retrieval of 3D models, and in the track "Protein surface shape retrieval including electrostatic potential" organized by members of the Conservatoire Nationale des Arts et Métiers, France, for the creation of an algorithm to classify digital models of protein surfaces.

## **Keywords**

Monitoring, 3D Models, Deep Learning, Cultural Heritage