ellis unit | TURIN Talk

Politecnico di Torino

Fondazione links – Passion for Innovation

Università di Torino – AI@UniTo

ISI Foundation

www.ellis.eu

## Riccardo Marin, Ellis Unit TUM

March 30th, 2026 - at 1:00 pm CET

Dipartimento di Informatica - UNITO
Sala Conferenze – III Piano -
Corso Svizzera 185- Turin, Italy

**Link:** https://tinyurl.com/y5yrzz9k

# From Scale to Structure: Toward 3D/4D Geometry-aware Spatial AI

Generative AI has increasingly extended to 3D assets, offering unprecedented opportunities for the analysis and synthesis of complex shapes. Such advancements, driven by large-scale datasets and massive computational power, appear to reinforce the “bitter lesson” that scale is the primary driver of progress. But how effective are these models at inferring and preserving the intrinsic structure of data? Studies indicate that even foundational vision models trained on billions of images lack a basic understanding of geometry. This limitation is further exacerbated in the synthesis of 4D assets, where shapes must evolve over time while obeying physical laws. This talk explores how incorporating geometric inductive biases and structural insights into the learning process not only boosts performance but also defines the next frontier of Spatial AI: the creation of physically consistent and structurally sound digital worlds.

**Riccardo Marin** is a researcher and interim professor at the Computer Vision Group of the Technical University of Munich (TUM), part of the Munich Center for Machine Learning (MCML), and a member of the European Laboratory for Learning and Intelligent Systems (ELLIS). Previously, he was a Marie-Curie postdoc at the University of Tubingen and a postdoc at Sapienza University of Rome. Riccardo obtained his PhD from the University of Verona, collecting the Best PhD Thesis Award in Computer Graphics from the Italian Chapter of EuroGraphics. His research focuses on 3D Geometry Processing, Spectral Shape Analysis, and, in particular, on Shape Matching and Virtual Humans applications.