

# Advanced AI Techniques for Material Analysis and Design: Part 1 - Prof. Filippo Berto, Università di Roma La Sapienza

*Thursday 19 June 2025 08:45 (1h 45m)*

Artificial intelligence (AI) has become a transformative tool in materials science, offering innovative approaches to address challenges in modeling and understanding material behavior. This lesson explores the core mechanic and the application of advanced AI architectures, such as Multi-Layer Perceptrons (MLPs), Convolutional Neural Networks (CNNs), Recurrent Neural Networks (RNNs) and Transformers, in analyzing and predicting the static and dynamic mechanical properties of additively manufactured materials. Key topics include how AI can model material anisotropy, address geometric imperfections, and predict performance under diverse testing conditions.