

# Modeling human cognition from ideal observer models to deep neural networks

*A seminar by Antonino Greco*

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**Room BENVENUTI**

**Department of Statistical Sciences**

Computational modeling plays a central role in cognitive neuroscience by providing formal tools to test theories and uncover the mechanisms underlying brain function and cognition. In this talk, I will outline how computational models can be used to investigate human cognition across different levels of complexity and abstraction. Starting with ideal observer models, which are simple models offering normative accounts for perceptual statistical learning, I will show how these models help characterize optimal learning trajectories and uncover the neural mechanisms responsible for encoding relevant information across learning. Then, I will move to more complex models such as deep neural networks, which are capable of capturing the richness of naturalistic, real-world behavior while still preserving mechanistic interpretability. Focusing on perceptual tasks in vision and audition, I will discuss how these models can be used to explore representation learning and to generate testable hypotheses about neural computation. Throughout the talk, I will highlight how these different modeling approaches can complement each other, providing a multi-scale understanding of perception, learning, and the predictive nature of cognitive processing and brain function.



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