

# COMPUTATIONAL RESEARCH in BOSTON and BEYOND SEMINAR

## METAMERS OF NEURAL NETWORKS REVEAL DIVERGENCE FROM HUMAN PERCEPTUAL SYSTEMS

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**ABSTRACT:**

Artificial neural networks now achieve human-level performance on tasks such as image and speech recognition, raising the question of whether they should be taken seriously as models of biological sensory systems. Such neural network models exhibit human-like patterns of behavior, and their feature spaces reliably predict brain activity. On the other hand, neural network models can often be fooled by small adversarial perturbations that have no effect on humans. In this talk, I will detail our work using “model metamers” to investigate similarities between neural networks and human sensory systems. Model metamers are physically distinct stimuli that produce nearly the same response within a model, and thus the same model prediction. Our results show that despite replicating aspects of human behavior and neural responses, present-day deep neural networks learn invariances that deviate markedly from those of biological sensory systems. Model metamers may help guide future model refinements to reduce or eliminate these discrepancies.

**FRIDAY, OCTOBER 2, 2020  
12:00 PM – 1:00 PM**

**ZOOM MEETING info:**  
**<https://mit.zoom.us/j/96155042770>**  
**Meeting ID: 961 5504 2770**

**<http://math.mit.edu/crib/>**