

# Probabilistic Models of Sensorimotor Control and Decision Making

**July 2**

**Tuesday, 12:30 pm**

**Billings Building—Rosedale Room**

**SPEAKER:**



**Daniel Wolpert, Ph.D.**

*Professor*

*Zuckerman Mind Brain Behavior  
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**Host: Kathleen M. Friel, Ph.D.**

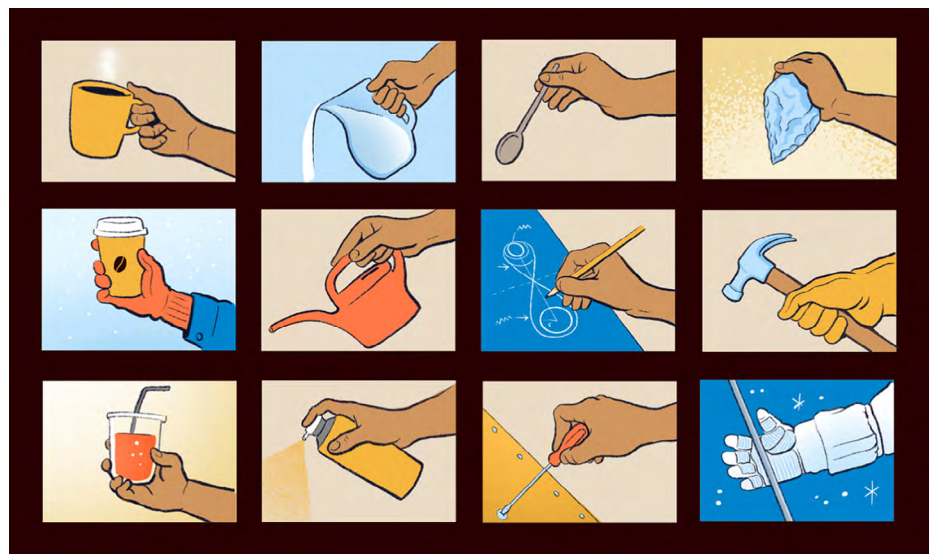
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## Abstract

The effortless ease with which humans move our arms, our eyes, even our lips when we speak masks the true complexity of the control processes involved. This is evident when we try to build machines to perform human control tasks. I will review our work on how humans learn to make skilled movements covering probabilistic models of learning, including Bayesian models as well as the role of context in activating motor memories. I will also review our work showing the intimate interactions between decision making and sensorimotor control processes. Taken together these studies show that probabilistic models play a fundamental role in human sensorimotor control.



## Publications

1. Heald, J. B., Wolpert, D. M., & Lengyel, M. (2023). *The Computational and Neural Bases of Context-Dependent Learning*. *Annu Rev Neurosci*, 46, 233-258. doi:10.1146/annurev-neuro-092322-100402
2. Heald, J. B., Lengyel, M., & Wolpert, D. M. (2021). *Contextual inference underlies the learning of sensorimotor repertoires*. *Nature*, 600(7889), 489-493. doi:10.1038/d41586-021-03028-x
3. McNamee, D., & Wolpert, D. M. (2019). *Internal Models in Biological Control*. *Annu Rev Control Robot Auton Syst*, 2, 339-364. doi:10.1146/annurev-control-060117-105206