# UC Merced

## Proceedings of the Annual Meeting of the Cognitive Science Society

### Title

Teaching Functions with Gaussian Process Regression

### Permalink

https://escholarship.org/uc/item/5kw98128

### Journal

Proceedings of the Annual Meeting of the Cognitive Science Society, 46(0)

### Authors

Malaviya, Maya

Ho, Mark K

### Publication Date

2024

Peer reviewed

eScholarship.org Powered by the California Digital Library
University of California

# Teaching Functions with Gaussian Process Regression

**Maya Malaviya**
Stevens Institute of Technology, Hoboken, New Jersey, United States

**Mark Ho**
Stevens Institute of Technology, Hoboken, New Jersey, United States

**Abstract**

Humans are remarkably adaptive instructors who can adjust advice on complex tasks based on a learner's current knowledge and goals. However, paradigms in cognitive psychology generally examine pedagogy in constrained and discrete tasks, like categorization or feature learning. We examine teaching in continuous domains, where there are theoretically infinite hypotheses, and model how teachers can formulate a computationally tractable Bayesian inference using Gaussian process regression. Taking inspiration from function learning tasks, we investigated how one teaches visual underlying functions by giving pedagogically-informed point examples. Preliminary evidence suggests teachers are sensitive to learners' priors about continuous functions. For instance, when learners expect a diverse range of function types (linear, quadratic, periodic, etc.) then teachers tend to select examples that help distinguish between those types. Conversely, teachers relaxed this constraint if learners had not seen multiple function types. Our results provide insight into mechanisms of pedagogical guidance in complex, continuous task domains.



In L. K. Samuelson, S. L. Frank, M. Toneva, A. Mackey, & E. Hazeltine (Eds.), *Proceedings of the 46th Annual Conference of the Cognitive Science Society.* ©2024 The Author(s). This work is licensed under a Creative Commons Attribution 4.0 International License (CC BY).