



Carnegie Mellon University
School of Computer Science

THEORY SEMINAR

Worst Case Analysis Meets Data Driven Optimization

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Friday, January 17

3:30pm

Newell Simon Hall 4305



Abstract: Traditional algorithm design is geared towards worst-case instances and fails to exploit structure that may be present within typical instances. In recent years, data driven algorithm design has emerged as a powerful alternative, offering performance gains in many settings. This line of research develops techniques for tuning parameters and hyperparameters over classes of algorithms using data. But what is the right class of algorithms to optimize over? My work combines these two approaches to algorithm design and aims to identify parameterized classes of algorithms that are simultaneously (1) expressive enough to contain approximately optimal solutions in the worst case, and (2) simple enough to be efficiently learnable from data. I will describe this approach in the simplest algorithmic context — search for a cheap solution within an unstructured space.

This talk is based on joint work with Evangelia Gergatsouli, Yifeng Teng, Christos Tzamos, and Ruimin Zhang.