In this talk, we highlight two challenges present in today's deep learning landscape that involve adding structure to the input or latent space of a model. We will discuss how to overcome some of these challenges with the use of learnable optimization sub-problems that subsume standard architectures and layers. These architectures obtain state-of-the-art empirical results in many domains such as continuous action reinforcement learning and tasks that involve learning hard constraints like the game Sudoku.

We will cover topics from these two papers:

Input Convex Neural Networks
Brandon Amos, Lei Xu, J. Zico Kolter
ICML 2017
https://arxiv.org/abs/1609.07152

OptNet: Differentiable Optimization as a Layer in Neural Networks
Brandon Amos, J. Zico Kolter
ICML 2017
https://arxiv.org/abs/1703.00443

Joint work with J. Zico Kolter