The training of deep neural networks is often facilitated by pretraining the hidden layers in unsupervised ways, such as the auto-encoder framework, leading to state-of-the-art performance on large classification problems. Such unsupervised methods can also be used to pretrain deep networks used for reinforcement learning. However, this ignores additional information that exists in a reinforcement learning paradigm via the ongoing sequence of state, action, and new state tuples. In this talk, I will demonstrate how learning a predictive model of state dynamics can result in a pretrained hidden layer structure that reduces the time needed to solve reinforcement learning problems related to the control of dynamic systems.

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