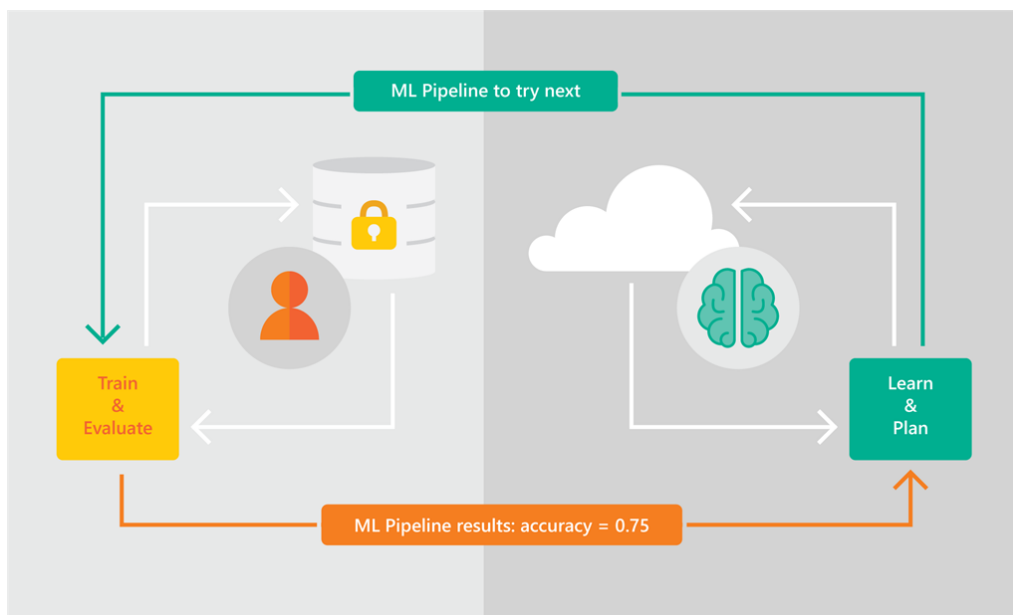
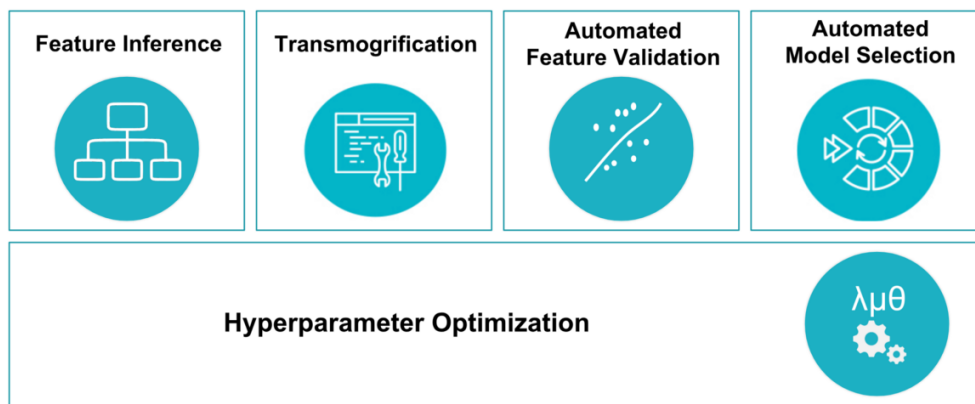
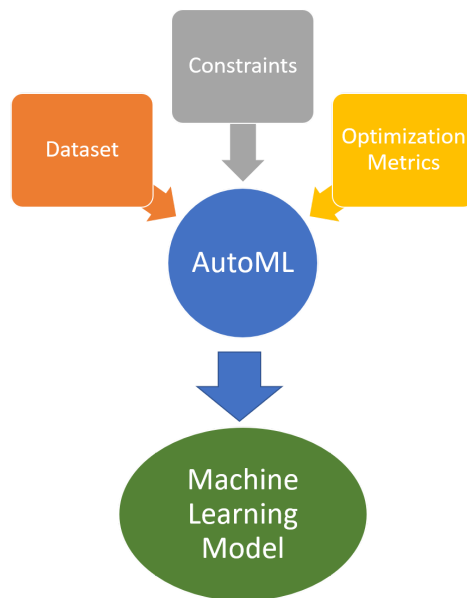


autoML



from medium [Using Machine Learning to Build Better Machine Learning](#)

- [Salesforce.com TransmogrifAI: The Brain Behind Einstein](#)

- Azure ML: Helping Developers Select the Right Machine Learning Model
- Waymo: Automated Model Selection for Self-Driving Vehicles
- [Using Evolutionary AutoML to Discover Neural Network Architectures](#)
- In “[Large-Scale Evolution of Image Classifiers](#),” presented at ICML 2017, we set up an evolutionary process with simple building blocks and trivial initial conditions.

Learning to Learn

- What is Meta Learning / Learning to Learn?
 - Go beyond train/test from same distribution.
 - Task between train/test changes, so model has to “learn to learn”
- Datasets

a)

b)

Lake et al, 2013, 2015

Image recognition Mini-Imagenet dataset (Vinyals et al. '16)

Given 1 example of 5 classes:

Classify new examples

Reinforcement learning

Given a small amount of experience

Solve a new task

Chelsea Finn, UC Berkeley **How? learn to learn many other tasks** *fig. from Duan et al. '17*

from Read et. al (2017) NIPS tutorial

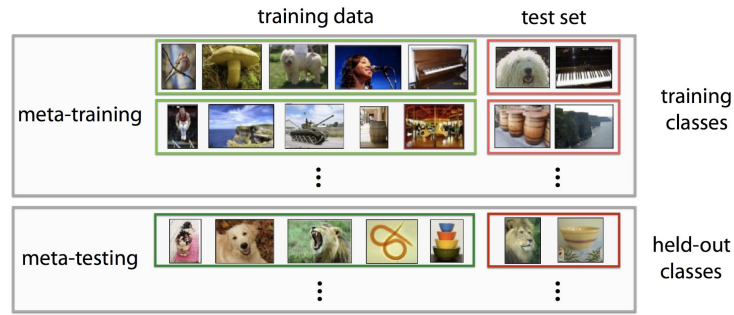
Learning to Learn



$$\theta = \arg \max_{\theta} \left[E_B \left[\sum_{(x,y) \in B} \log P_{\theta}(y|x) \right] \right].$$

from Read et. al (2017) NIPS tutorial

Learning to Learn



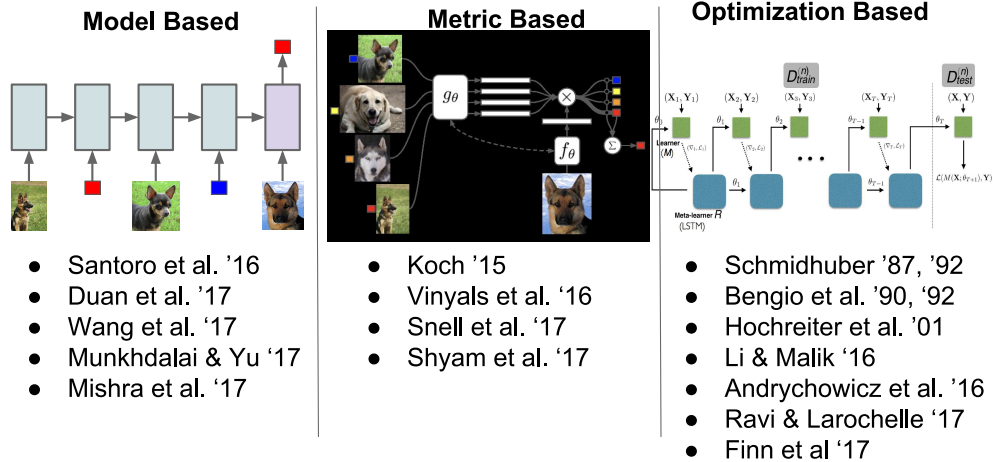
Chelsea Finn, Berkeley AI

diagram adapted from Ravi & Larochelle '17

$$\theta = \arg \max_{\theta} E_{L \sim T} \left[E_{S \sim L, B \sim L} \left[\sum_{(x,y) \in B} \log P_{\theta}(y|x, S) \right] \right].$$

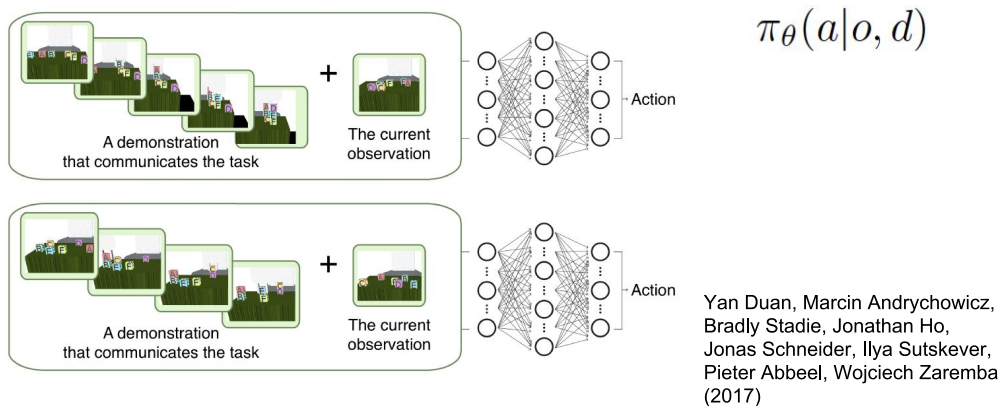
from Read et. al (2017) NIPS tutorial

Learning to Learn



from Read et. al (2017) NIPS tutorial

One-shot imitation learning: From a single demo d, learn to solve a new task as demonstrated.



from Read et. al (2017) NIPS tutorial