Challenges in TAMP

- how to acquire new low-level motor skills?

  [Levin et al., ISER 2016] [Schenck et al., CoRL 2017] [OpenAI, 2018] [Ebert et al., CoRL 2017]……

most robot learning

- which variables in the environment are relevant to the skill?

  ongoing work w/ Victoria Xia&Leslie Kaelbling

- under what conditions will executing the skill achieve some particular effect in the world?
- how to sample the parameters that satisfy those conditions?

our focus of learning

this talk *[Wang&Garrett&Kaelbling&Lozano-Perez, IROS 2018]*

GoodPour($w_s, h_s, w_t, h_t, c_{\text{grasp}}, c_{\text{pour}}, r_{\text{pose}}$) = True

Learning preconditions of a skill

Formulate GoodPour($w_s, h_s, w_t, h_t, c_{\text{grasp}}, c_{\text{pour}}, r_{\text{pose}}$) = True

as Score($\underbrace{w_s, h_s, w_t, h_t, c_{\text{grasp}}, c_{\text{pour}}, r_{\text{pose}}}_{\theta}$) > 0

- Learn the **super level set** of a constraint $\{\theta : g(\theta > 0)\}$
- Construct a sampler to sample within the super level set