boxLCD: A Simple Testbed for Learned Simulator Research

Matthew Wilson

github.com/matwilso/boxLCD

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Deep Learning for Simulation (simDL)

**Motivation**

- Robotics simulators are widely used, but inflexible and inaccurate
- Data-driven / **learned simulation** is a promising way forward
  - for debugging, evaluation, training (sim2real)

How else to handle things like paint, fire + smoke, microwaves, light switches, and shrimp curry?

**Experiments**

1. **Learn a Model of the Environment**

   TOP: ground truth. MIDDLE: model prediction. BOTTOM: error. RED LINE: prompt

2. **Use that Model as a Learned Simulator for RL**

   And it works nearly as well as training in the base simulator

   Success rates (n=1000, on real):
   - Urchin Real: 0.998
   - Urchin Lenv: 0.955
   - Luxo Real: 0.999
   - Luxo Lenv: 0.988