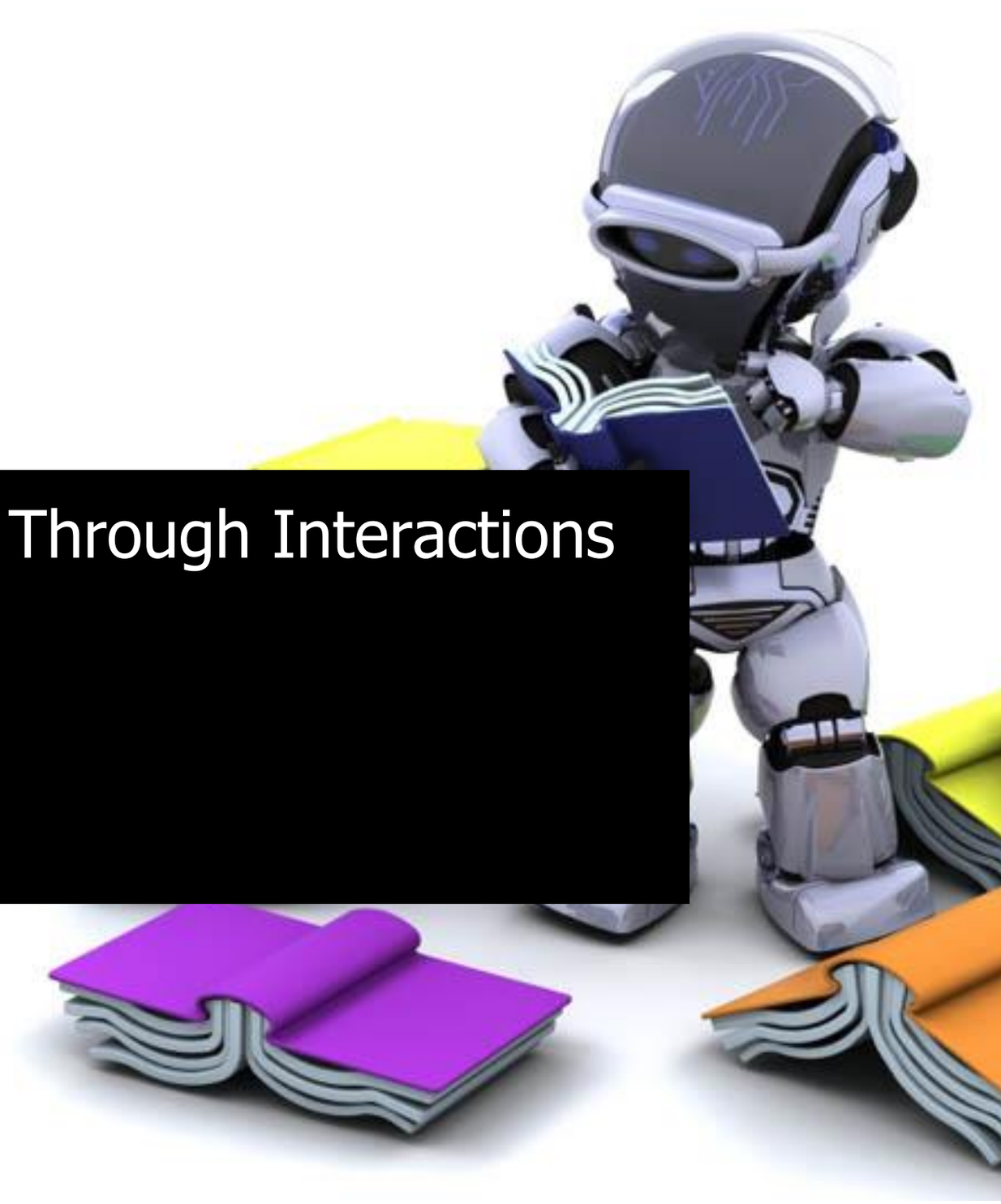
# Learning to Interact & Teaching Through Interactions

August 8th 2018

*Jens Kober*



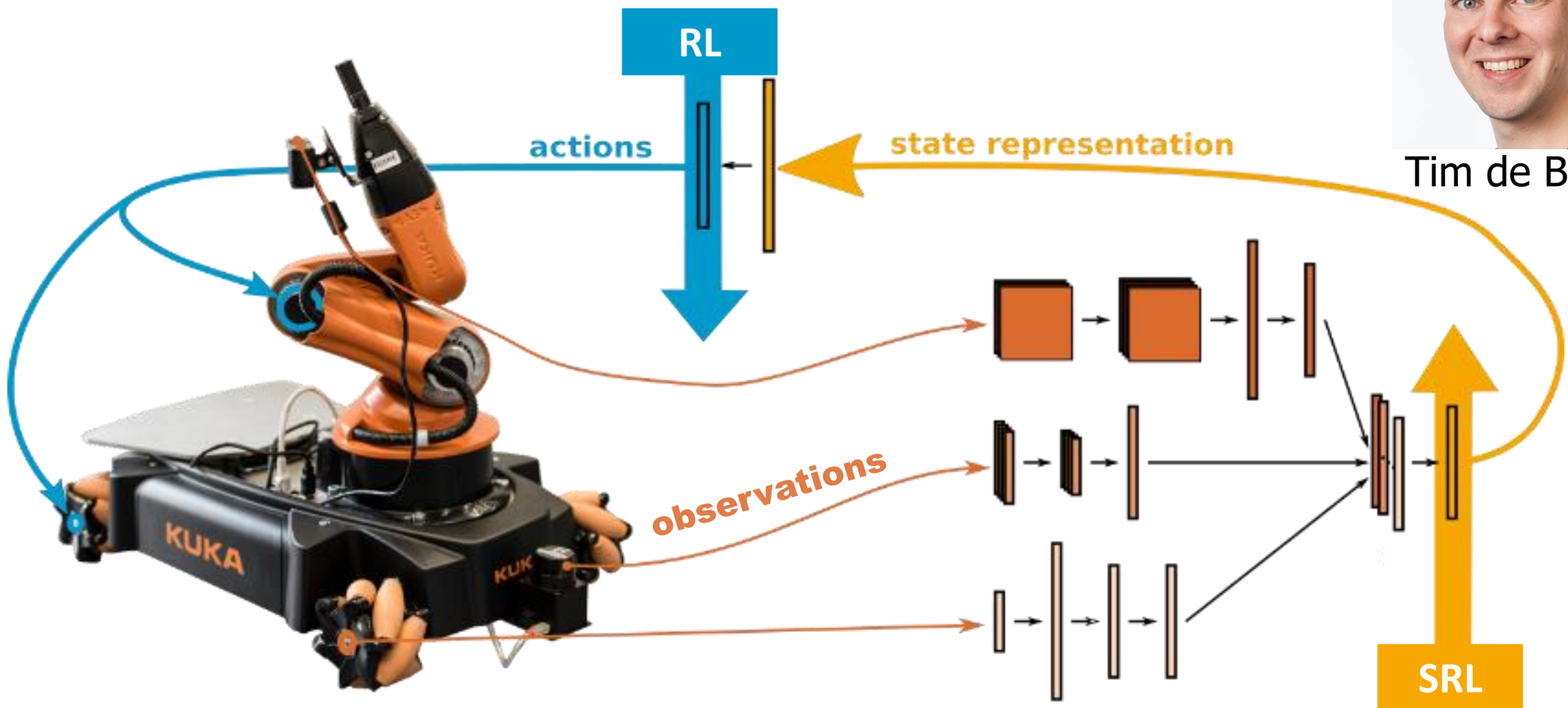
# Interacting with the Elements

Nikolaos Moustakis

- Learn optimal wind-speed estimators
  - Kalman filter
  - Black box
- Learn optimal controllers
  - LQR, MPC, etc.
  - Black box

# Interacting with the Environment

Tim de Bruin




- Auto encoding
- Instantaneous reward prediction
- (Inverse) state dynamics
- Slowness and diversity
- Reinforcement Learning

# State Representation Learning: TORCS

Tim de Bruin

**Test Track**

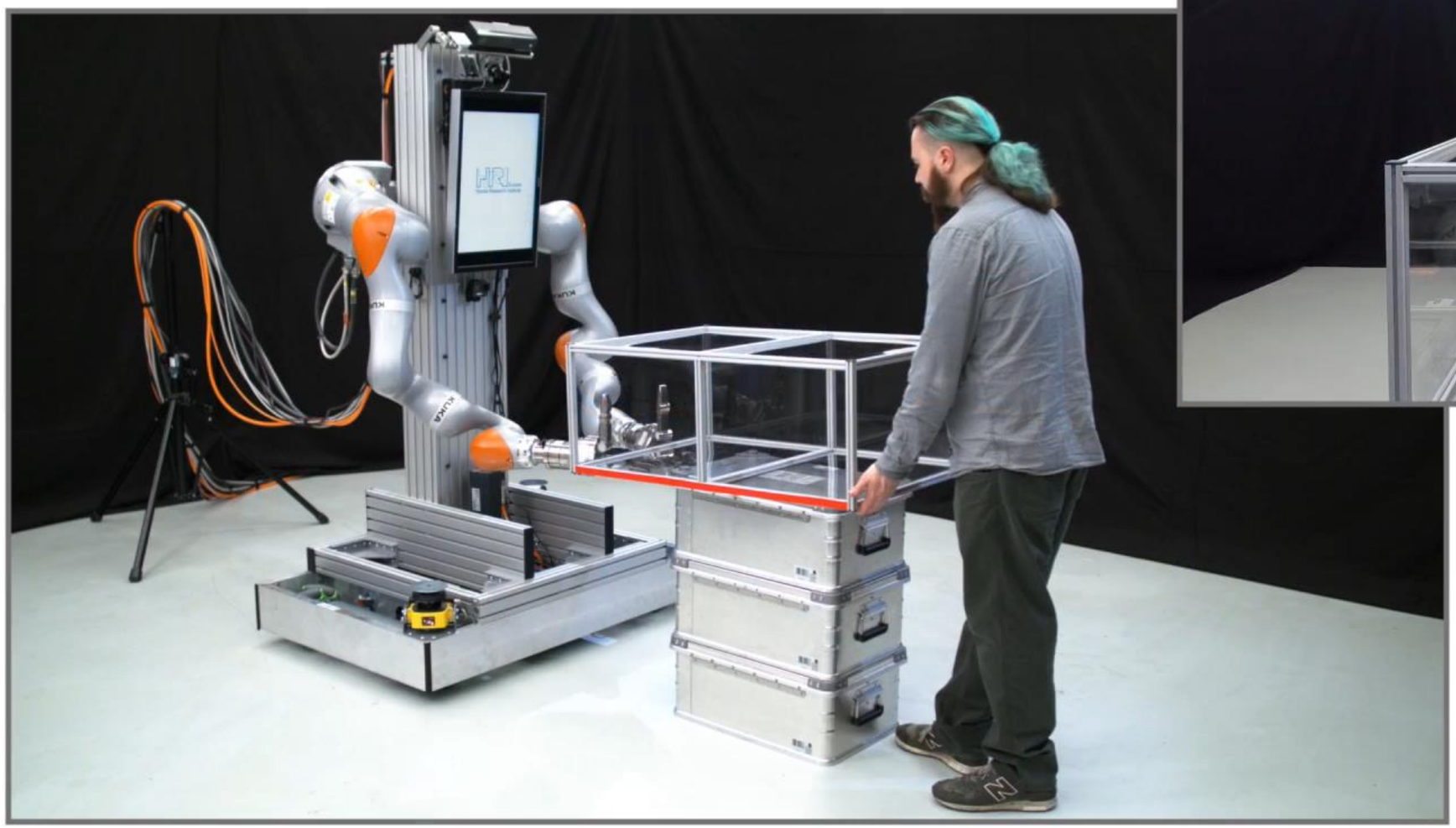
**RL only**

**RL + SRL**

# Interacting with Humans

Tamas Bates

Linda
van der Spaa



# Teaching through interactions

- Continued student-teacher interaction
  - Additional demonstrations
  - Intermittent feedback

- Largely missing in robot learning!

- Benefits
  - Speed-up
  - Complex tasks
  - Intuitive

karinprinsloo.com

brainbalancecenters.com

# State-of-the-Art:
# Reinforcement Learning


*PetarKormushev*

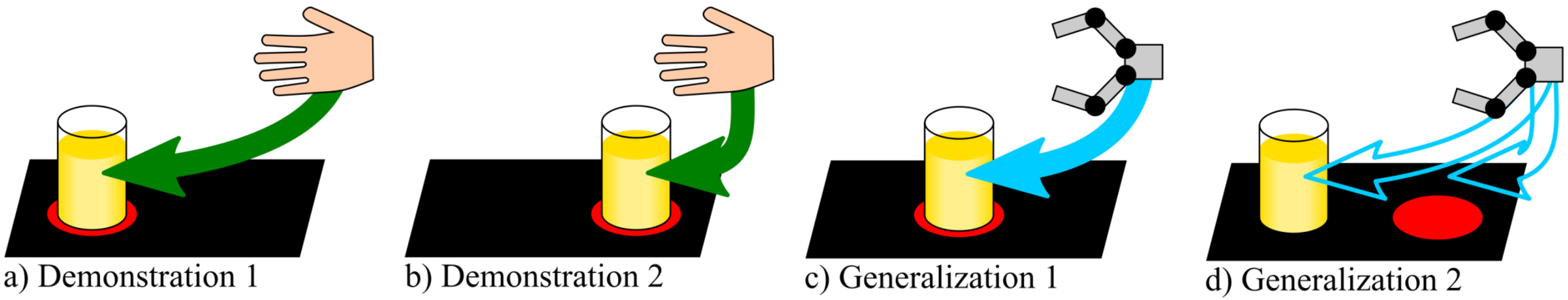
*Google*

# RL + corrective human advice

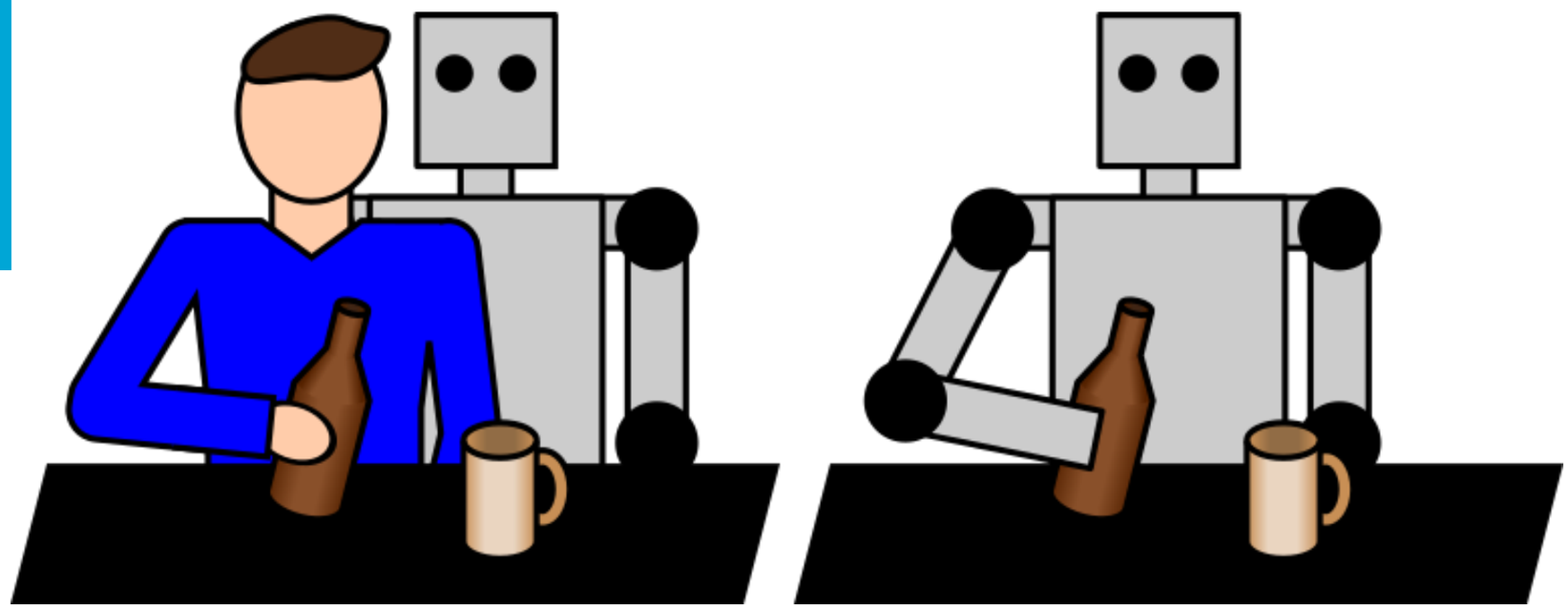
Carlos Celemin

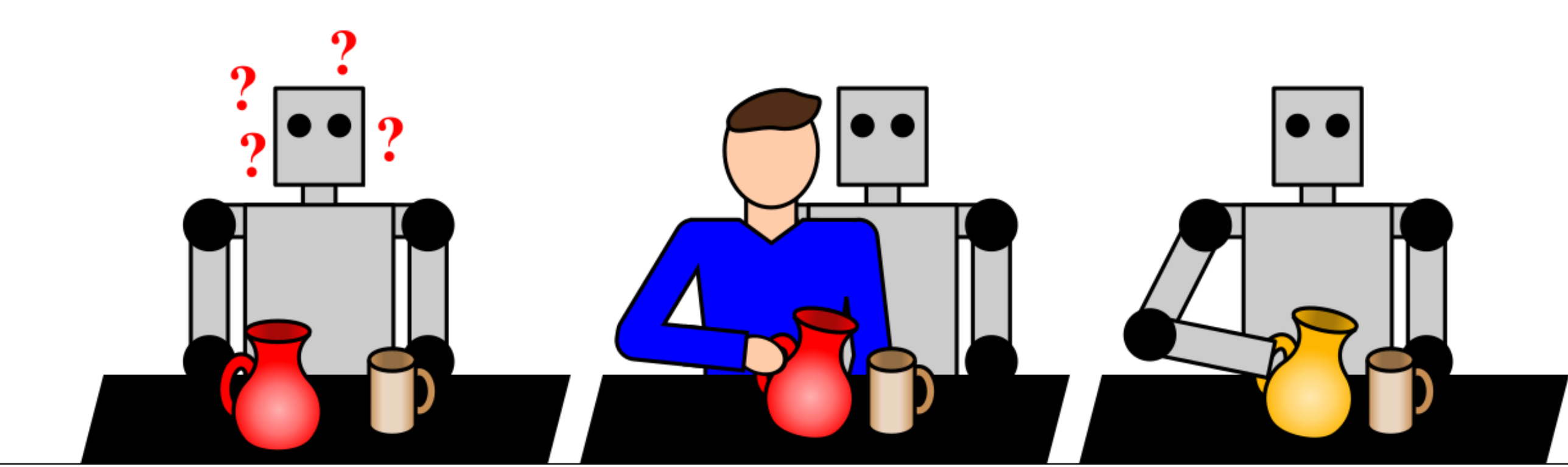
# State-of-the-Art: Imitation Learning

- Very efficient
- Combinatorial explosion



# Sketch





*Walt Disney Studios – Real Steel*

# We are hiring

- Assist/Assoc Professor “Robot motion control” asap
- Assist/Assoc Professor “Human-robot interaction” asap
- PostDoc “Decision making and learning for mobile robots” asap
- PhD “Intermittent imitation learning” Jan 2019
- PhD “Efficient DL for mapping and localization of intelligent vehicles” asap
- PhD “Pedestrian/Cyclist Motion Prediction” asap

# Questions?

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