Motivation
- Validating the safety of autonomous vehicles in the real world is costly, dangerous, and time-consuming.
- Model human-driven vehicles for realistic simulation testing of autonomous vehicles.
- Imitation learning approaches have worked well for driving a single car.
- This project extends imitation learning to driving multiple cars.

Algorithm: Parameter Sharing GAIL

This algorithm extends GAIL to the multi-agent setting using parameter sharing.

Policy and Critic: Deep Neural Nets
- Policy representation
  - Non-linearity
  - High dimensionality
  - Stochasticity
  - 64 Gated Recurrent Units
- Critic representation
  - Wasserstein GAN with gradient penalty
- Feed forward network consisting of (128, 128, 64) ReLU units

Future work
Improving model performance by (i) reward augmentation, (ii) applying learning algorithms that encourage more diverse behavior, and (iii) using a recurrent critic in order to account for partial observability.

Results
- Better human driving imitation
- Better emergent metrics

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