# Sequential Classical Control

## Final Project CS 780

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**General Definition:** Imitation learning (IL) techniques aim to mimic human behavior in a given task. An agent (a learning machine) is trained to perform a task from demonstrations by learning a mapping between observations and actions.[1]

- Behavior Cloning (BC):
  Methods learn a mapping from states to actions as a supervised learning problem [2]

- Inverse Reinforcement Learning (IRL):
  Attempt to recover the reward function the agent is trying to optimize. Then optimizat that reward function.

- Training robots or control systems
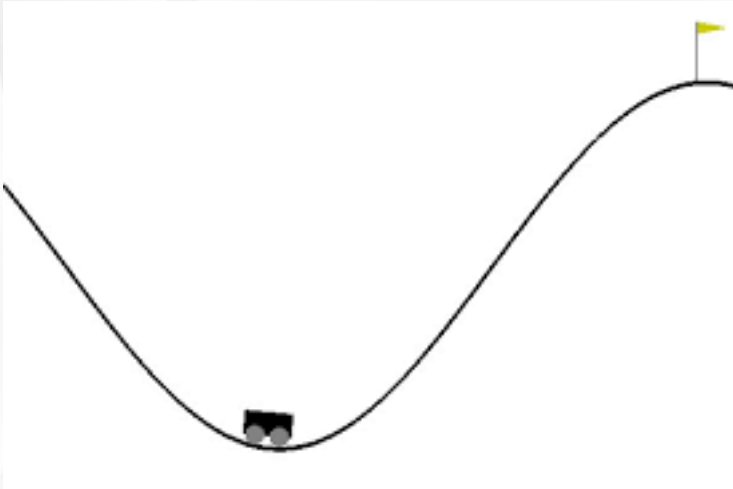
- Autonomous Vehicles

Figure: caption

**Motivation**

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Mostafa Hussein has proposed a general framework that can autonomously detect adversarial demonstrations and remove them the training set and generate a policy by constraining FEM through Maximum Entropy (Max-Ent). In my collaboration with this work an equivalence was proven between the dual of the Max-Ent formulation and Maximum Likelihod Estimtation (MLE) of Multinomial Logistic Regression.

[1]   Ahmed Hussein et al. "Imitation Learning: A Survey of Learning Methods".
      In: *ACM Comput. Surv.* 50.2 (Apr. 2017). ISSN: 0360-0300. DOI:
      10.1145/3054912. URL: https://doi.org/10.1145/3054912.

[2]   Dean A Pomerleau. "Efficient training of artificial neural networks for
      autonomous navigation". In: *Neural computation* 3.1 (1991), pp. 88–97.