
Assignment 2

csce774, Spring 2022

Assigned: February 23

Due: May 2, 11:59pm

Option 1: Do nothing. Your score from Assignment 1 will count for 10% of the final grade.

Option 2: Complete the assignment below, which will count for 5% of the final grade. Your score for Assignment 1 will count for 5% of the final grade.

Carefully and thoughtfully read the paper

Nicholas Roy, Ingmar Posner, Tim Barfoot, Philippe Beaudoin, Yoshua Bengio, Jeannette Bohg, Oliver Brock, Isabelle Depatie, Dieter Fox, Dan Koditschek, Tomas Lozano-Perez, Vikash Mansinghka, Christopher Pal, Blake Richards, Dorsa Sadigh, Stefan Schaal, Gaurav Sukhatme, Denis Therien, Marc Toussaint, and Michiel Van de Panne. "From machine learning to robotics: Challenges and opportunities for embodied intelligence", 2021. arXiv:2110.15245

and submit, by PDF attachment to an email to the instructor, answers to the questions below.

- What is inductive bias? Why do the authors believe that choosing appropriate inductive biases is uniquely challenging for robotic systems?
- What is dual process theory (DPT)? How do the authors argue that DPT is relevant for understanding connections between deep learning and robotics?
- The authors argue that compact representations and efficient reasoning are important for robot systems. Why is it challenging to obtain these?
- In Section 5, the authors describe how narrow ideas about how robot hardware should be designed can be influenced by existing control and perception algorithms. How does this related to learning?
- Why are verification, validation, and performance evaluation more challenging for robots than for other machine learning systems?
- The paper identifies a number of challenges and opportunities for the use of learning methods in robotics. Which of these challenges do you think will be the most difficult for the research community to overcome? Why? Which of the opportunities discussed seems the most promising to you? Why?