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Title: Working in Reverse: Inverse Optimization Methods for Pyomo in Online Settings

Abstract: In "traditional" inverse optimization, a researcher attempts to parameterize an objective function given a feasible solution, inverting the classical optimization solution process. Two recent papers by Dong, Chen, & Zeng and Barmann, Martin, Pokutta, & Schneider extend work from the online convex optimization field to parameterize this objective function in real time, meaning that a researcher must now attempt to parameterize the objective function as parameters in the feasible region change and as the observed optimal solution also changes. We create a Python class with online capabilities to implement these methods for a subset of convex optimization problems. This class was built with and had in mind the Pyomo optimization package. We will demonstrate the capabilities of this class via computational experiments, including experiments focused upon parameterizing travel cost functions in traffic problems. These experiments will either be directly from or inspired by the papers.

Key words: inverse optimization, traffic, online