

Evaluating the Perceived Safety of Urban City via Maximum Entropy Deep Inverse Reinforcement Learning

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Abstract

Inspired by expert evaluation policy for urban perception, we proposed a novel inverse reinforcement learning (IRL) based framework for predicting urban safety and recovering the corresponding reward function. We also presented a scalable state representation method to model the prediction problem as a Markov decision process (MDP) and use reinforcement learning (RL) to solve the problem. Additionally, we built a dataset called SmallCity based on the crowdsourcing method to conduct the research. As far as we know, this is the first time the IRL approach has been introduced to the urban safety perception and planning field to help experts quantitatively analyze perceptual features. Our results showed that IRL has promising prospects in this field. We will later open-source the crowdsourcing data collection site and the model proposed in this paper.

Keywords: inverse reinforcement learning; urban perception; crowdsourcing

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Note: Camera ready in process.