

CRII: CPS: Emerging Markets and Myopic Decision-Making in Multi-Modal Transportation Systems: Models and Validation

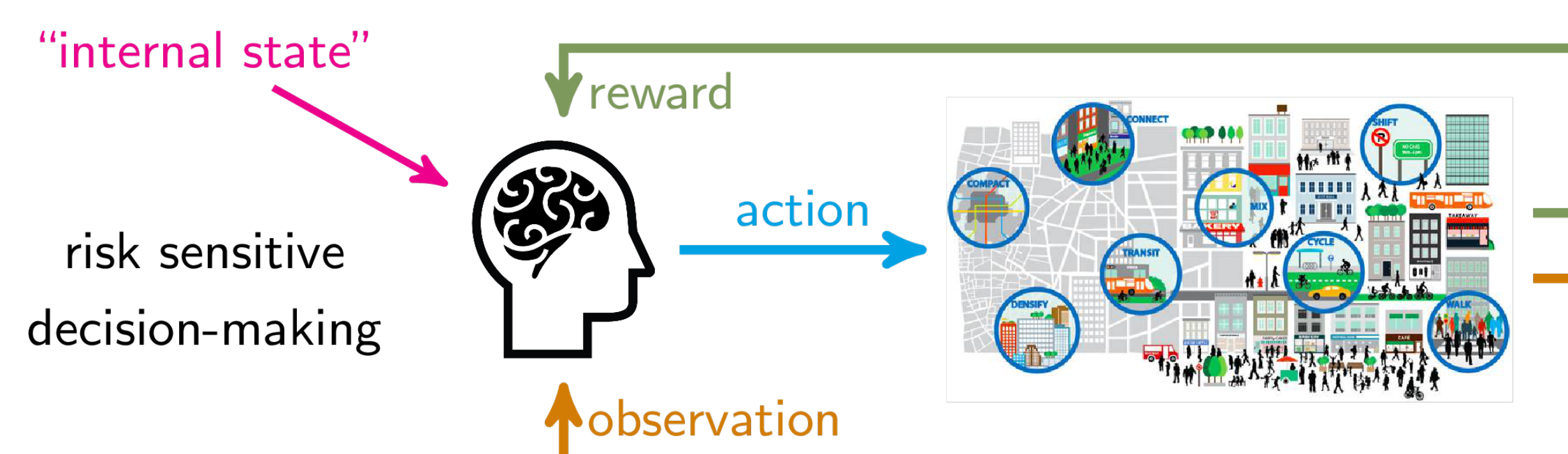
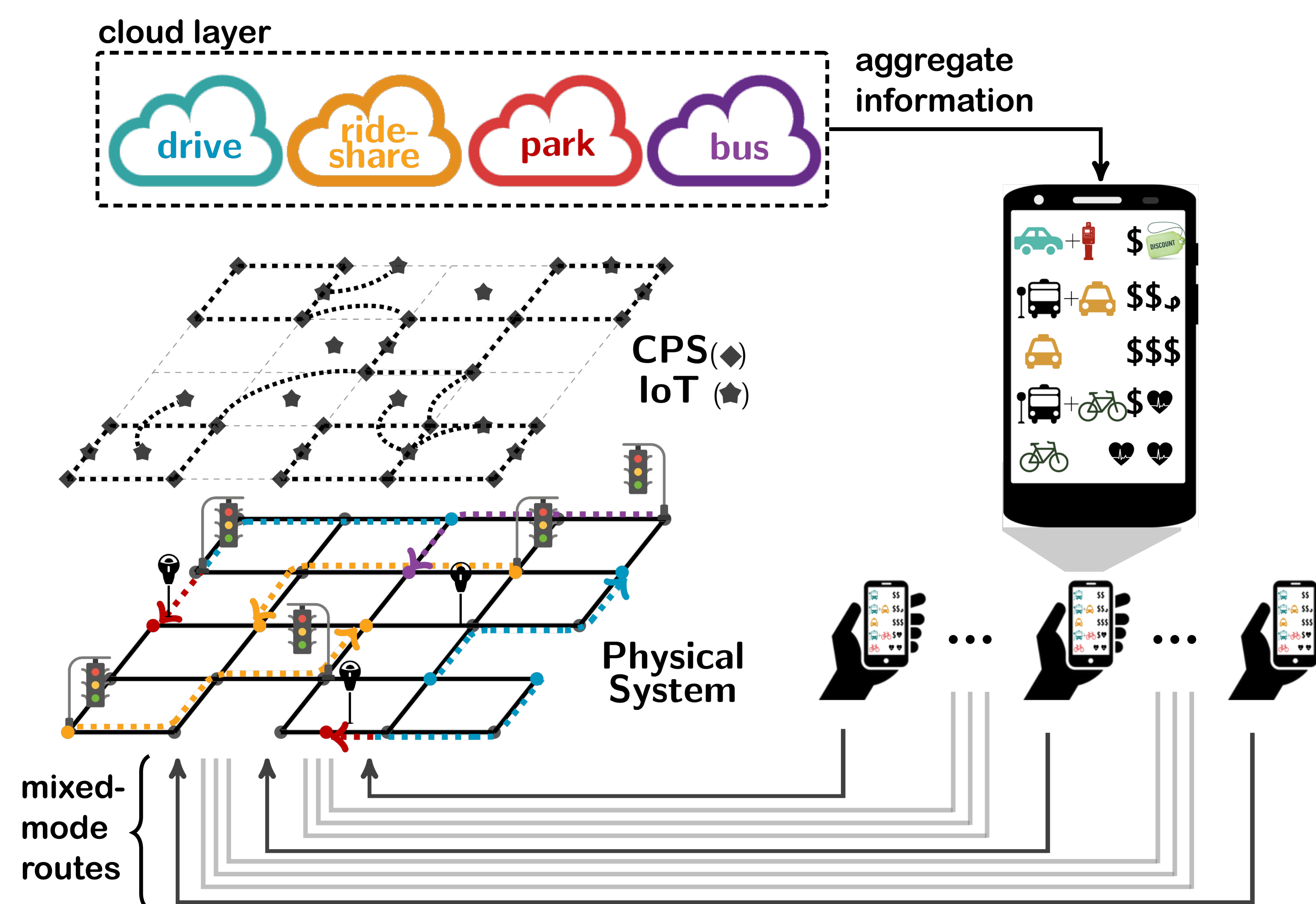
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Challenge:

Given expanding urban centers and stressed infrastructure, this project seeks to address the "service gap" between what is needed and what exists by leveraging rich data streams, constant connectivity, and emerging, innovative markets for a variety of services in the transportation sector

Solution:

- **Aim 1:** Develop novel inverse risk-sensitive reinforcement learning algorithms that leverage prospect theoretic models of human decision making [1]
- **Aim 2:** Develop algorithms for online incentive design and models of multi-sided markets leveraging dynamical systems tools [2,3]
- **Aim 3:** Work with SDOT to parse, organize and standardize data (parking, scooter, bike), and develop data informed models [2,4] that are now being used in setting policy.



Scientific Impact:

- This project aims to lay the theoretical and computational foundation to learning plausible decision-making models of humans and integrate with with online, adaptive mechanisms for shaping behavior in intelligent transportation systems

Broader Impact:

- This project engages domain experts (SDOT) to develop practice-driven solutions for S-CPS
- Students (grad and undergrad) engage with the community via our municipal partners and through this engagement, they are being exposed to the jobs of tomorrow's S-CPS

[1] Ratliff, Mazumdar, IEEE TAC 2019; IEEE CDC 2016
 [2] Fiez, Sekar, Zheng, Ratliff. UAI, 2018
 [3] Ratliff, Fiez., IEEE TAC 2019
 [4] Fiez, Ratliff, IEEE ITS 2019

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