

Reinforcement Learning for Eco-Lagrangian Control at Intersections

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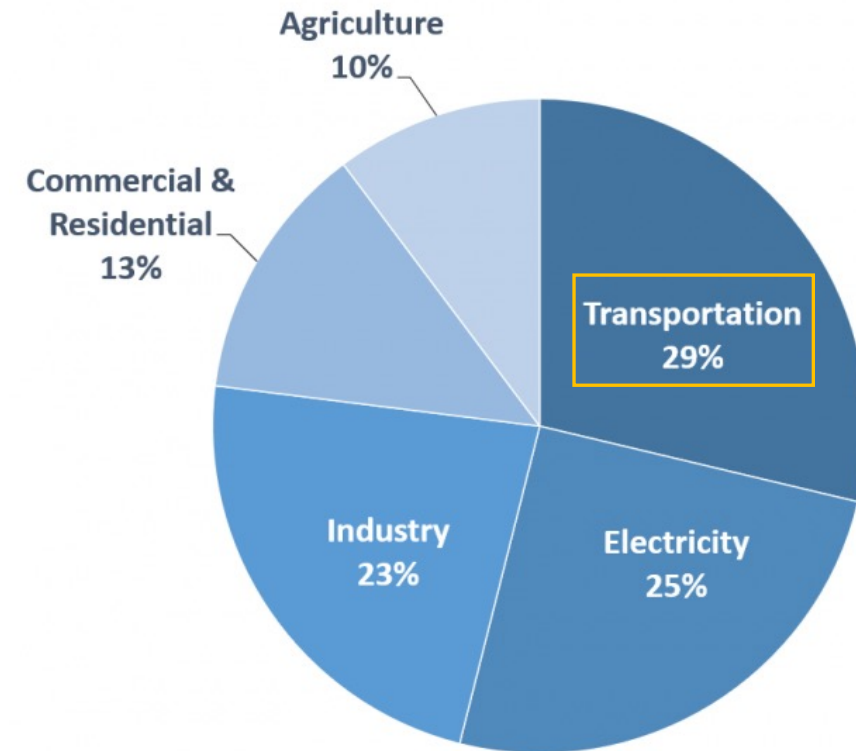


Robotics for Climate Change Workshop
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U.S. GHG Emission

Transportation sector in the US contributes **29%** to the green house gas emission (GHG) in which **77%** is due to land transportation.

Challenge: In arterial roads, traffic signals result in stop-and-go traffic waves producing acceleration, and idling events, increasing fuel consumption and emission levels.



Cities as Robots Sync..

Future cities are operation grounds for fleets of autonomous vehicles.

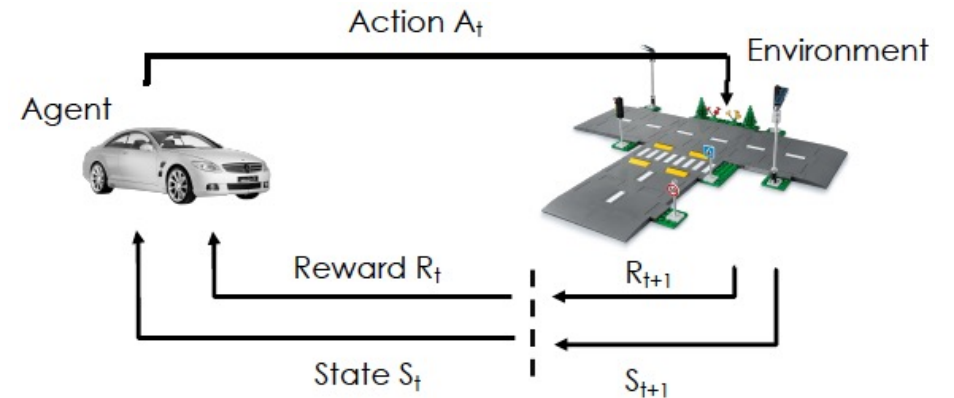
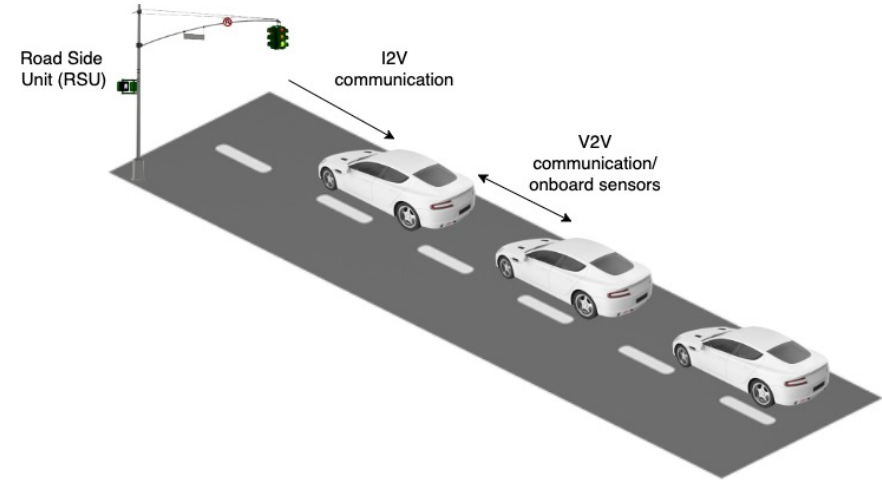
Motivation: Reduce GHG levels and fuel consumptions of vehicles when approaching and leaving a signalized intersection.

Objectives:

- Reduce fuel consumption
- Reduce CO₂ emission
- Reduce the impact on travel time

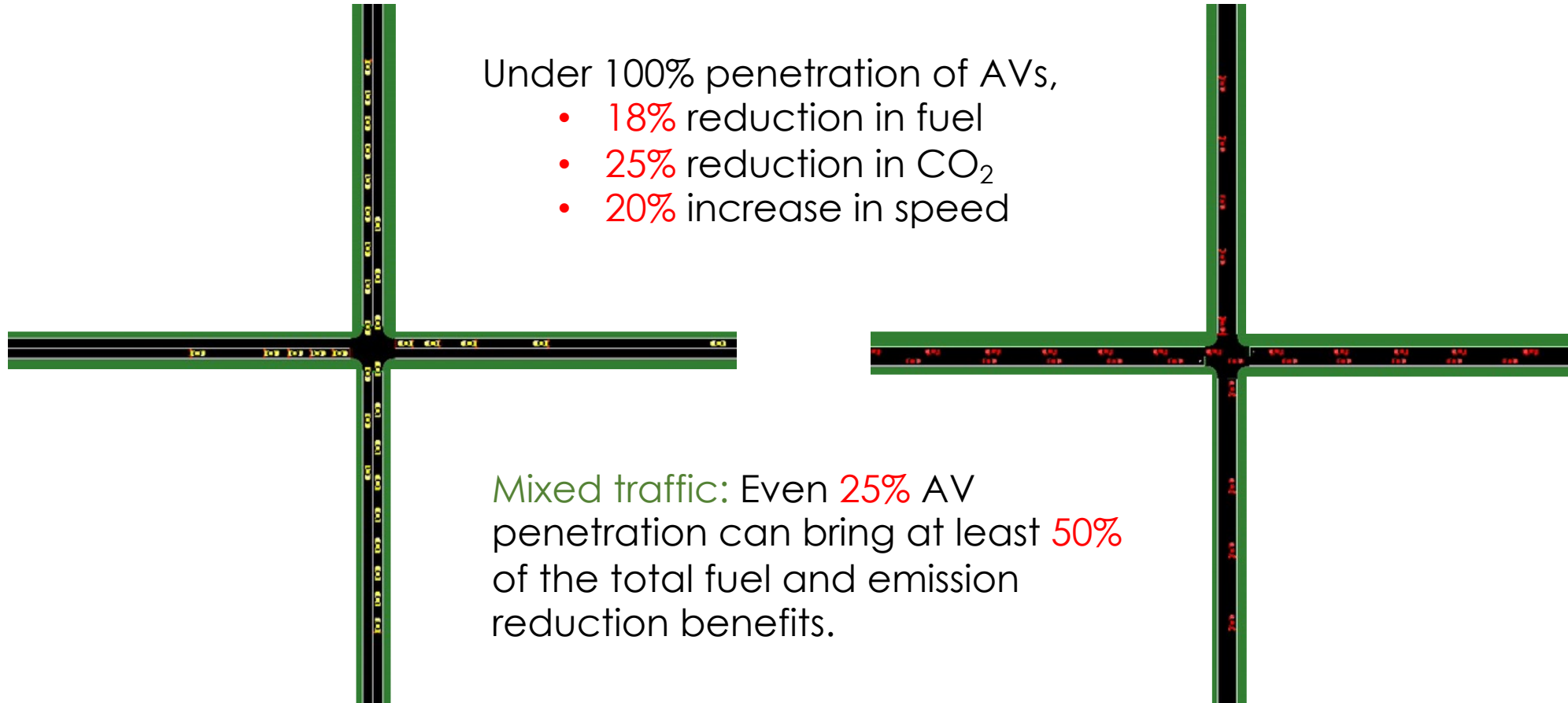
Approach: Model-free Reinforcement learning for multi-agent control.

- POMDP formulation
- Policy gradient methods



Cities as Robots Sync..

Note: In the PDF version, the videos are not supported. Please visit our website for the videos.
<https://vindulamj.github.io/eco-driving-rl/>



Human driving behavior
(100% human driver penetration)

Learned control behavior
(100% AV penetration)

Looking forward to seeing
you at our poster!

