Traffic3D: A Rich 3D-Traffic Environment to Train Intelligent Agents

Aston University

Deepeka Garg, Maria Chli, George Vogiatzis

{gargd, m.chli, g.vogiatzis}@aston.ac.uk

Scan me

↑
Learn more about this study

Goal

Build and easily deploy physically intelligent and photorealistic traffic simulations

Key Features

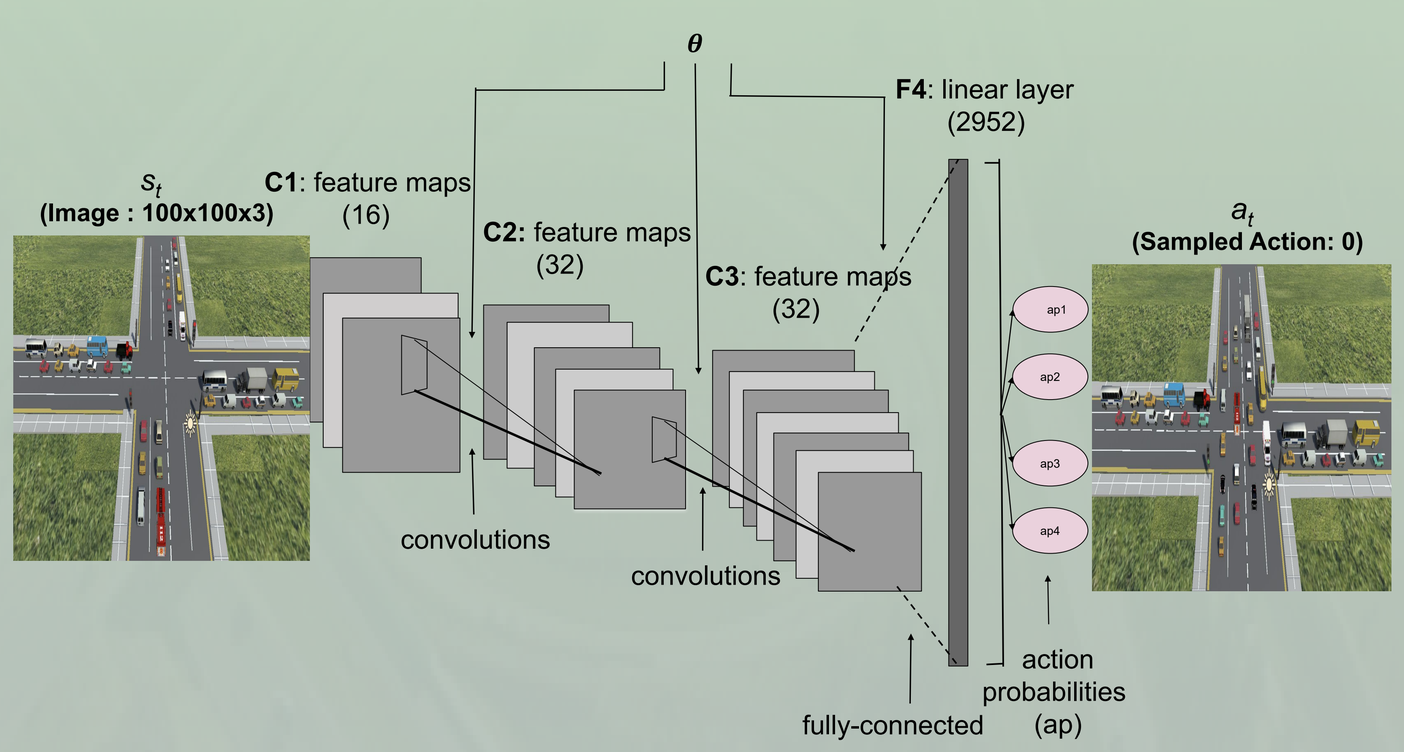
Traffic3D facilitates:

- Faithful simulation of vehicle behaviors
- Precise physics of movement of vehicles
- Photorealism
- Inexpensive generation of diverse traffic data
- Python support for deep learning research
- Complete customization over its design for potential reuse

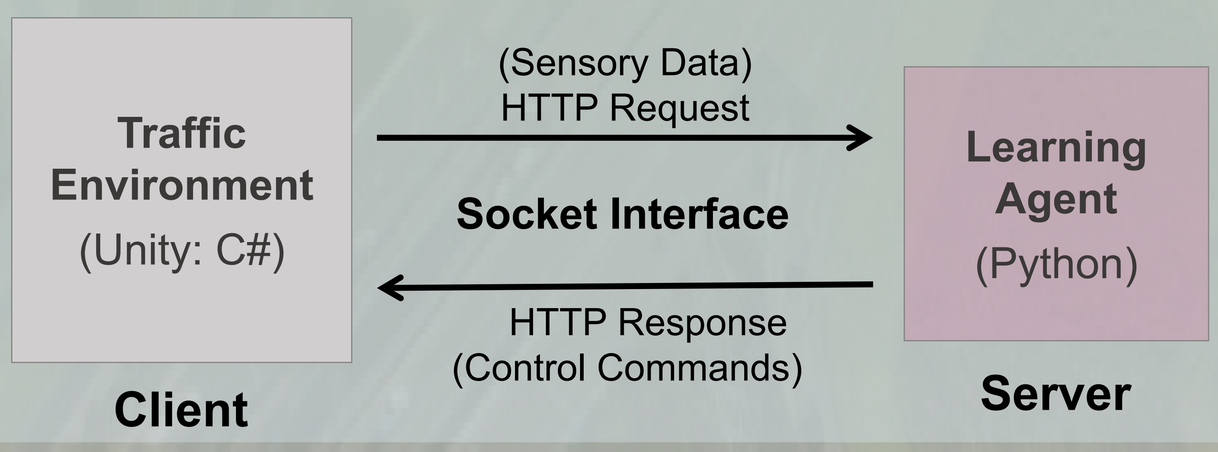
Signal Optimization Solution

Optimizes signal regimes in real time, based *solely* on live photorealistic camera footage

Network Architecture



Traffic3D's Design Architecture

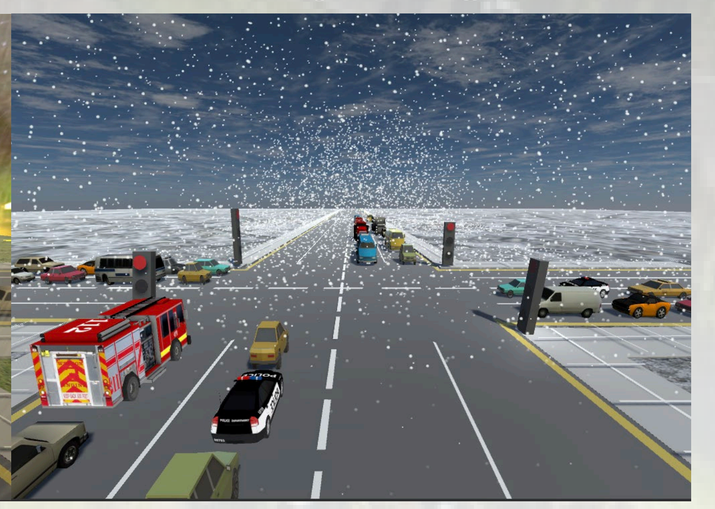


Scenes Simulated on Traffic3D

A sunset scene

A dimly-lit night

A rainy evening

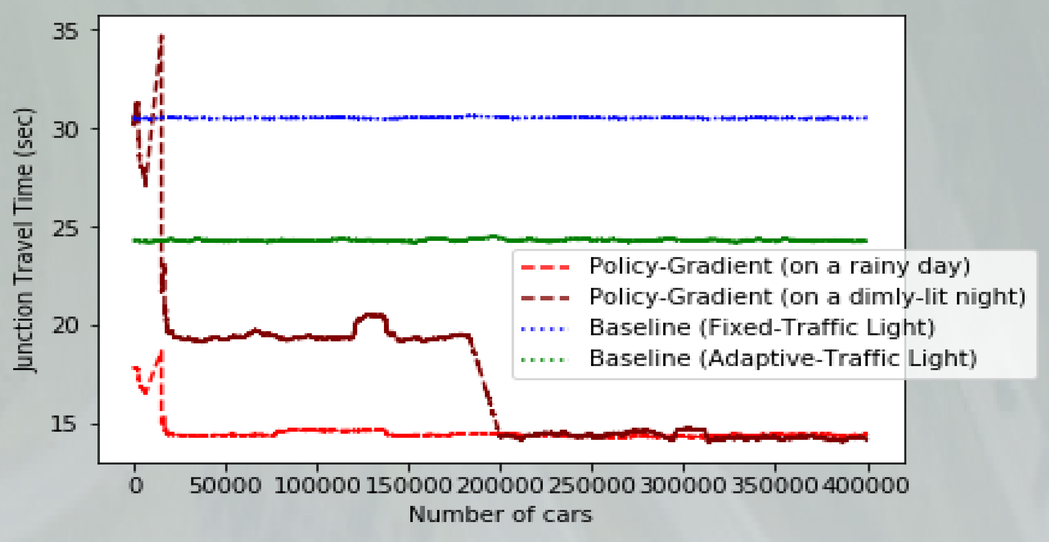


A snowy day

Results

Our signal system's performance:

- on a rainy day
- on a dimly-lit night



Transferring previously learned knowledge:

- To prioritize traversal of emergency vehicles

Our signal solution significantly outperforms the state-of-the-art signal control methods