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Synthesizing Personalized Training Programs for Improving Driving Habits via Virtual Reality

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Synthesizing Personalized Training Programs for Improving Driving Habits via Virtual Reality

Outline

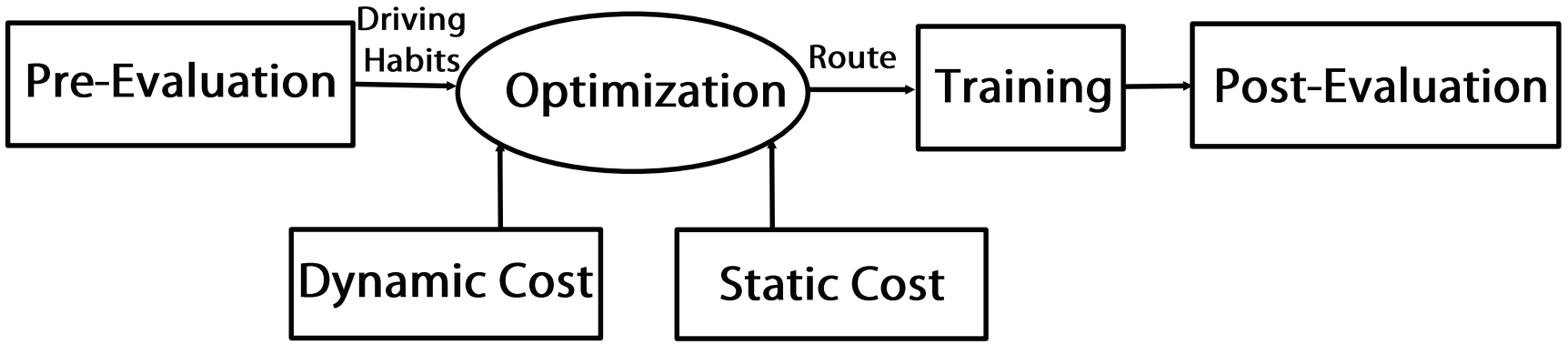
- Motivation
- Framework
- Scene Modelling
- Pre-Evaluation
- Route Synthesis
- Training
- Results

Motivation

Motivation

Framework

Framework of Our Approach



Scene Modelling

Scene Modelling

Cars

Pedestrians

Scene Modelling

Crossroads

A Street with Four Lanes

Pre-evaluation

Traffic Events

Traffic Events about Pedestrians

Traffic Events about Turning

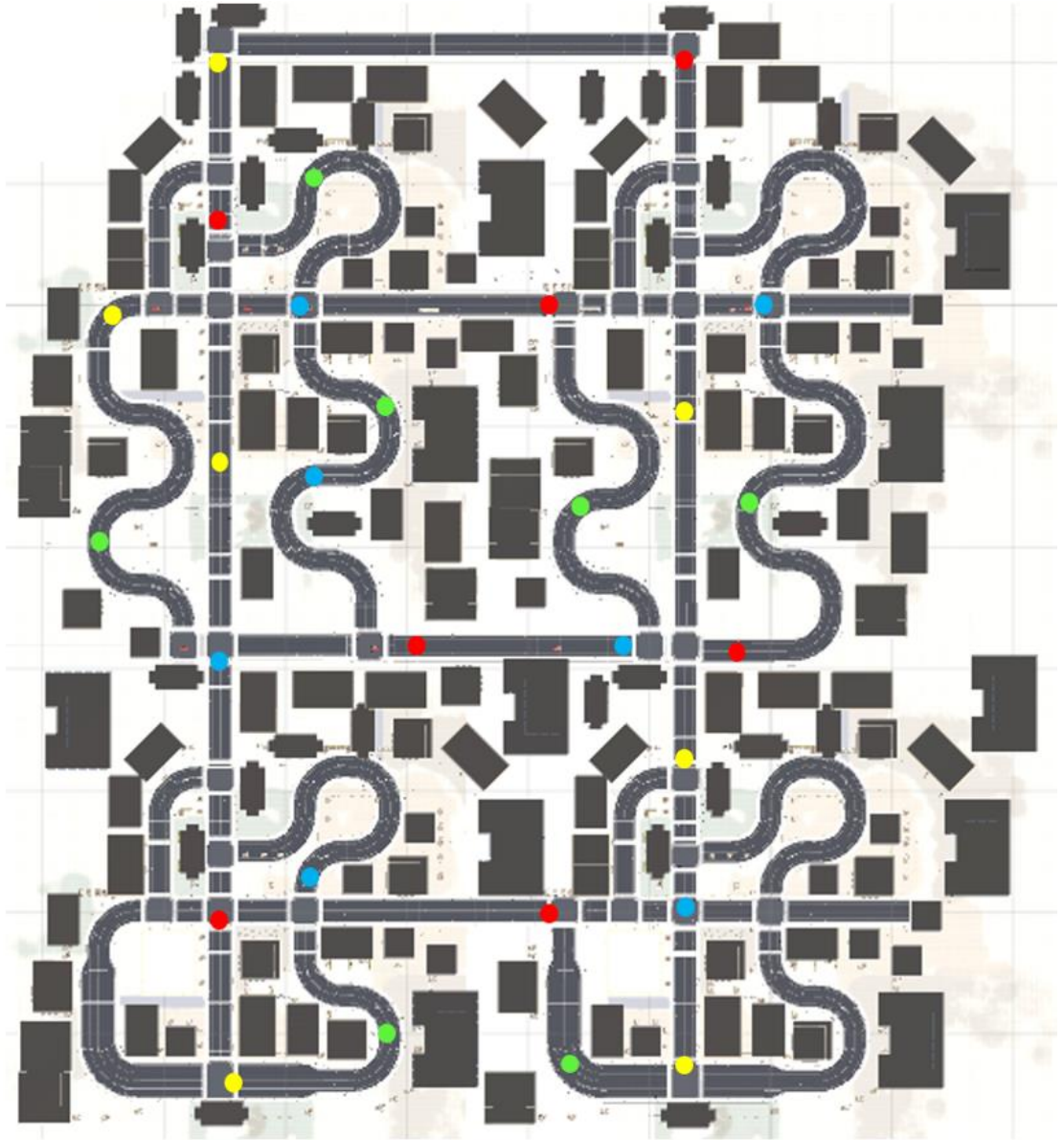
Traffic Events

Traffic Events about Changing Lane

Traffic Events about the Front Car

City Used for Evaluation

- Changing Lane
- Pedestrian
- Front Car
- Turning



Driving Habits

Look at Rear-view Driving Mirror
before a Turn

Look at Rear-view Driving Mirror
before Changing Lane

Driving Habits

Signal before a Turn

Signal before Changing Lane

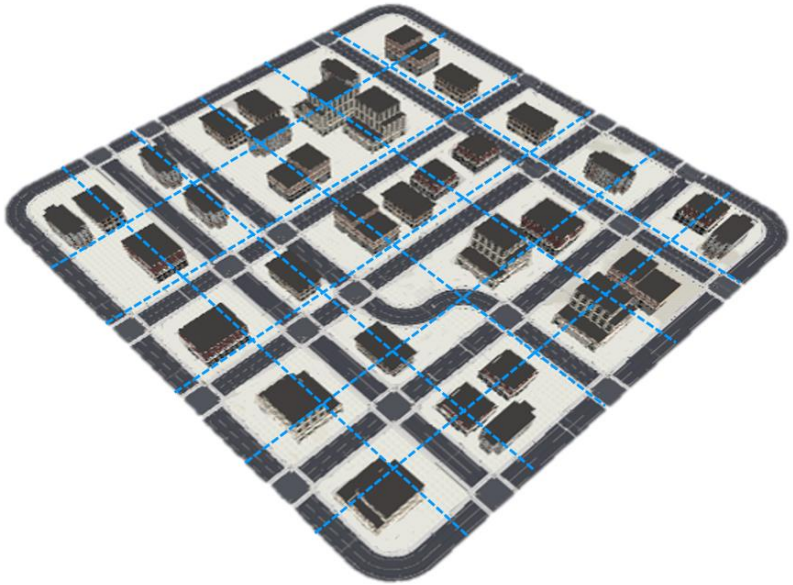
Driving Habits

Stop for Pedestrians

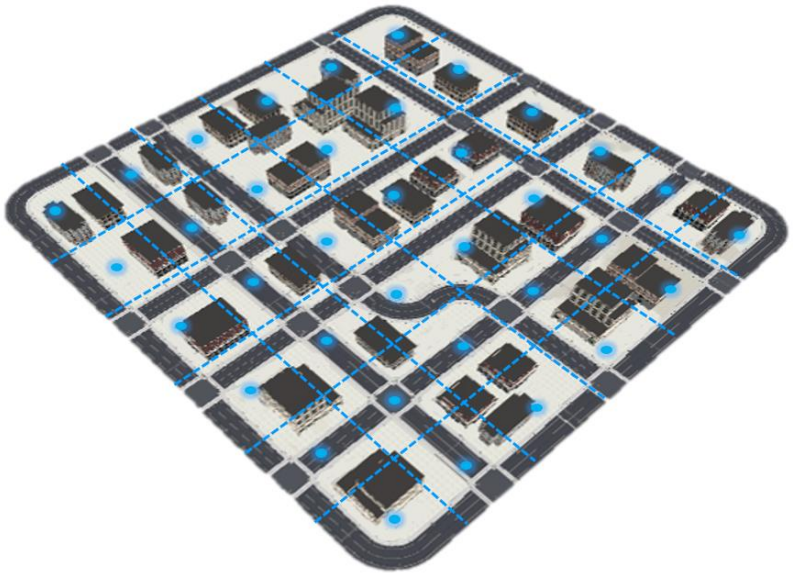
Reduce Speed When Passing a Crossroad

Route Synthesis

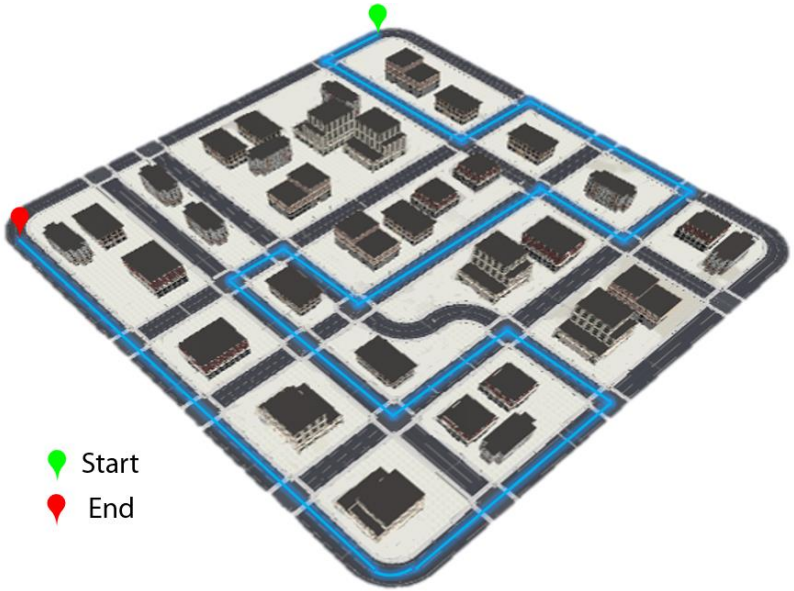
Route Synthesis



(a) Initial map

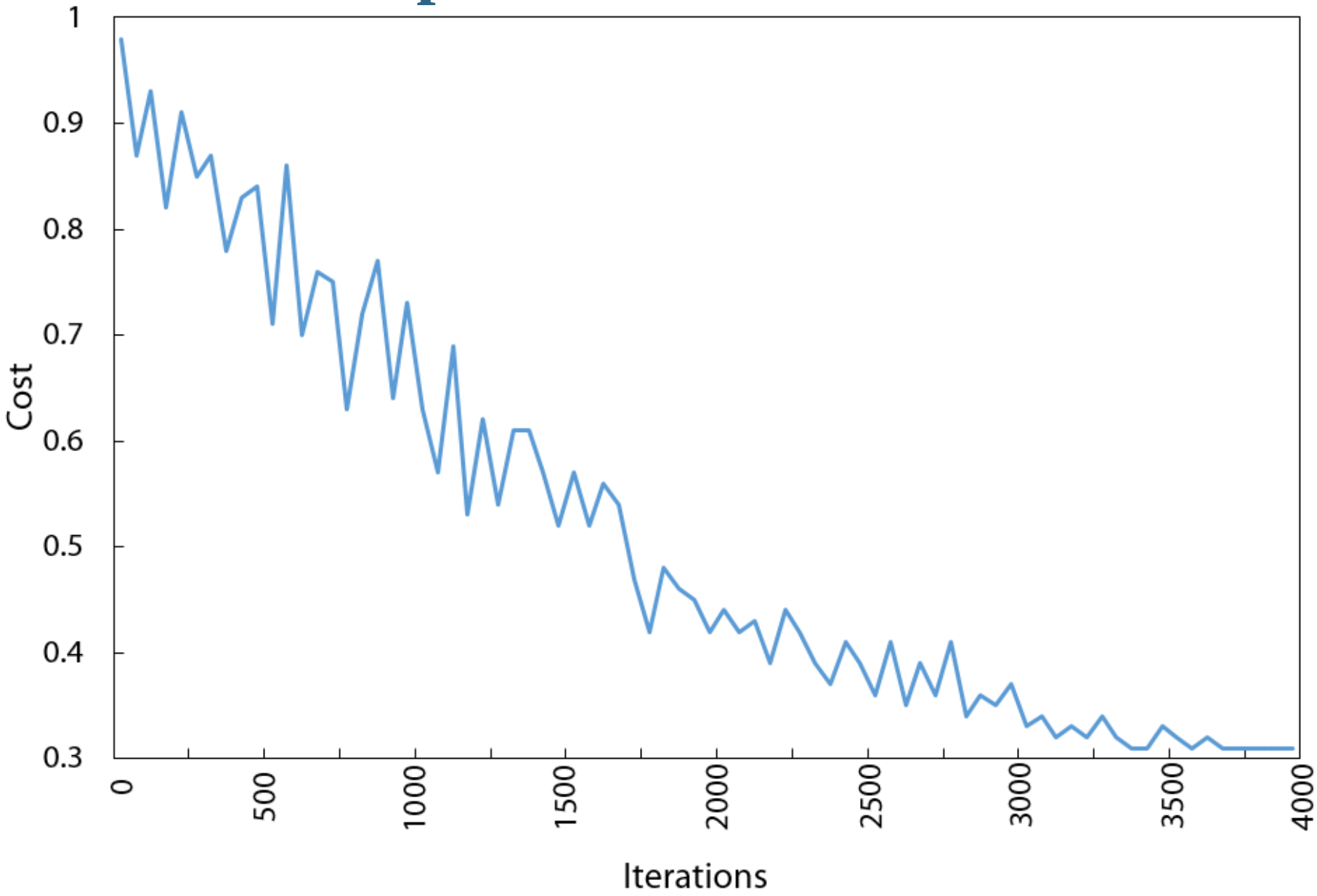


(b) Cells replaced by nodes

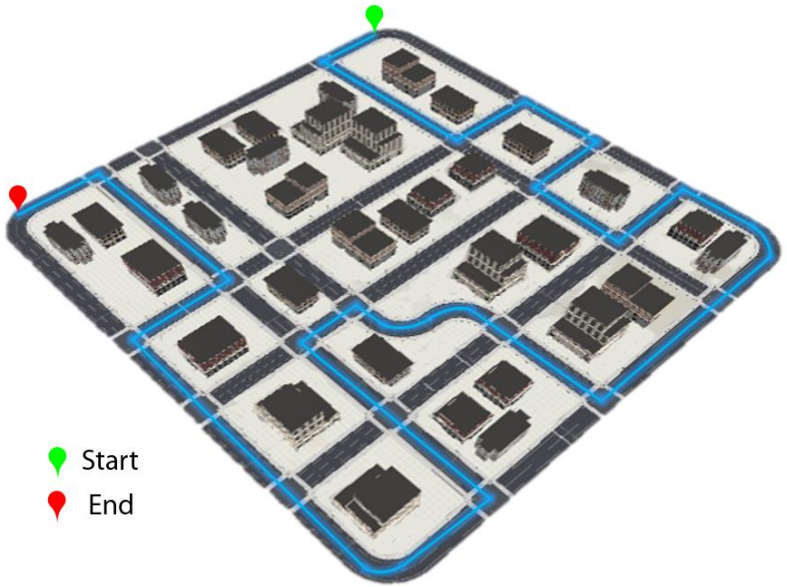


(c) A synthesized route

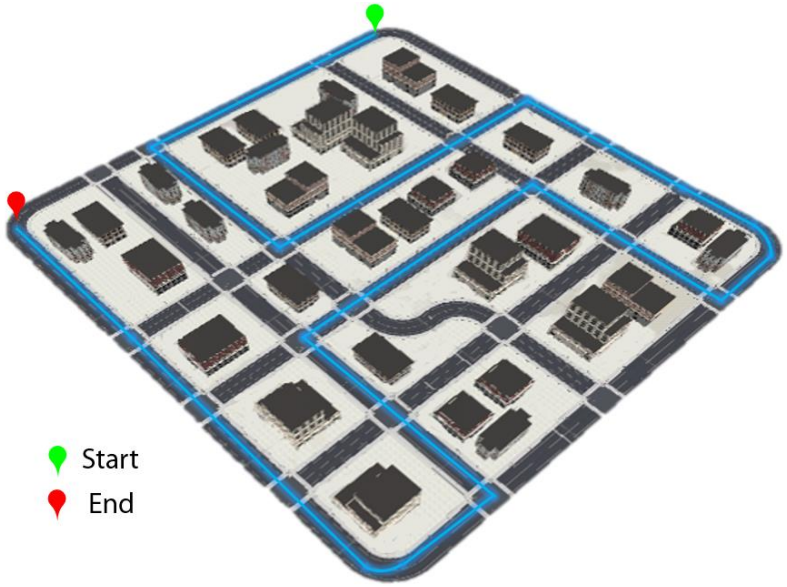
Optimization Process



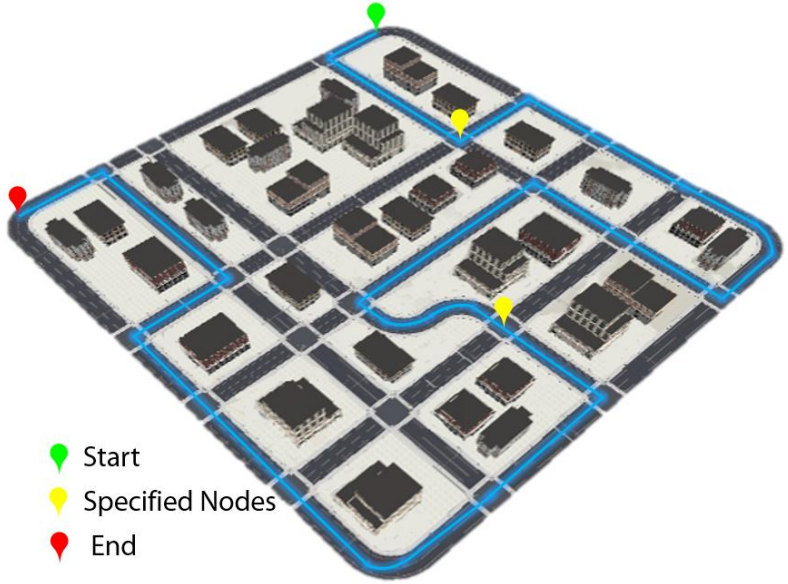
Other Synthesis Results



(a) More Turns

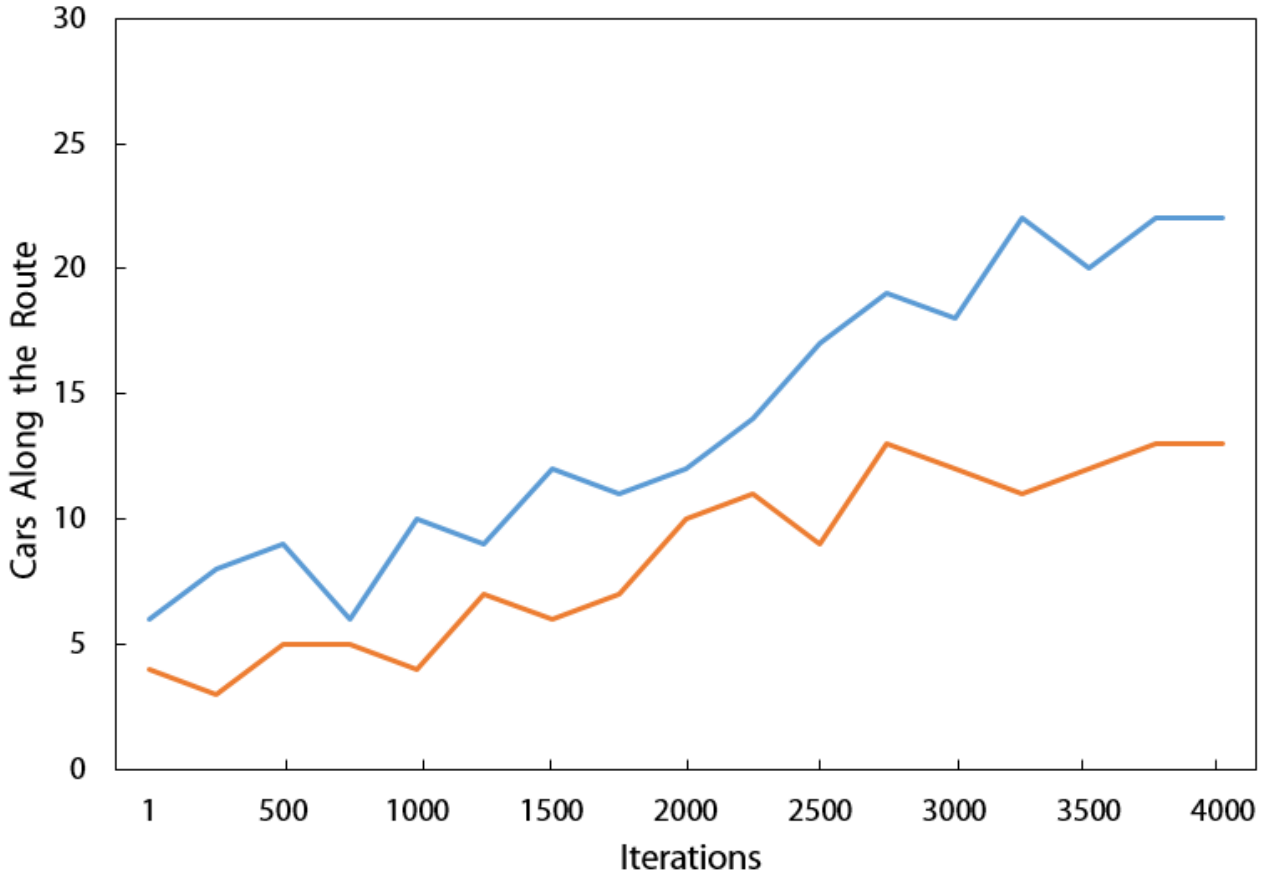


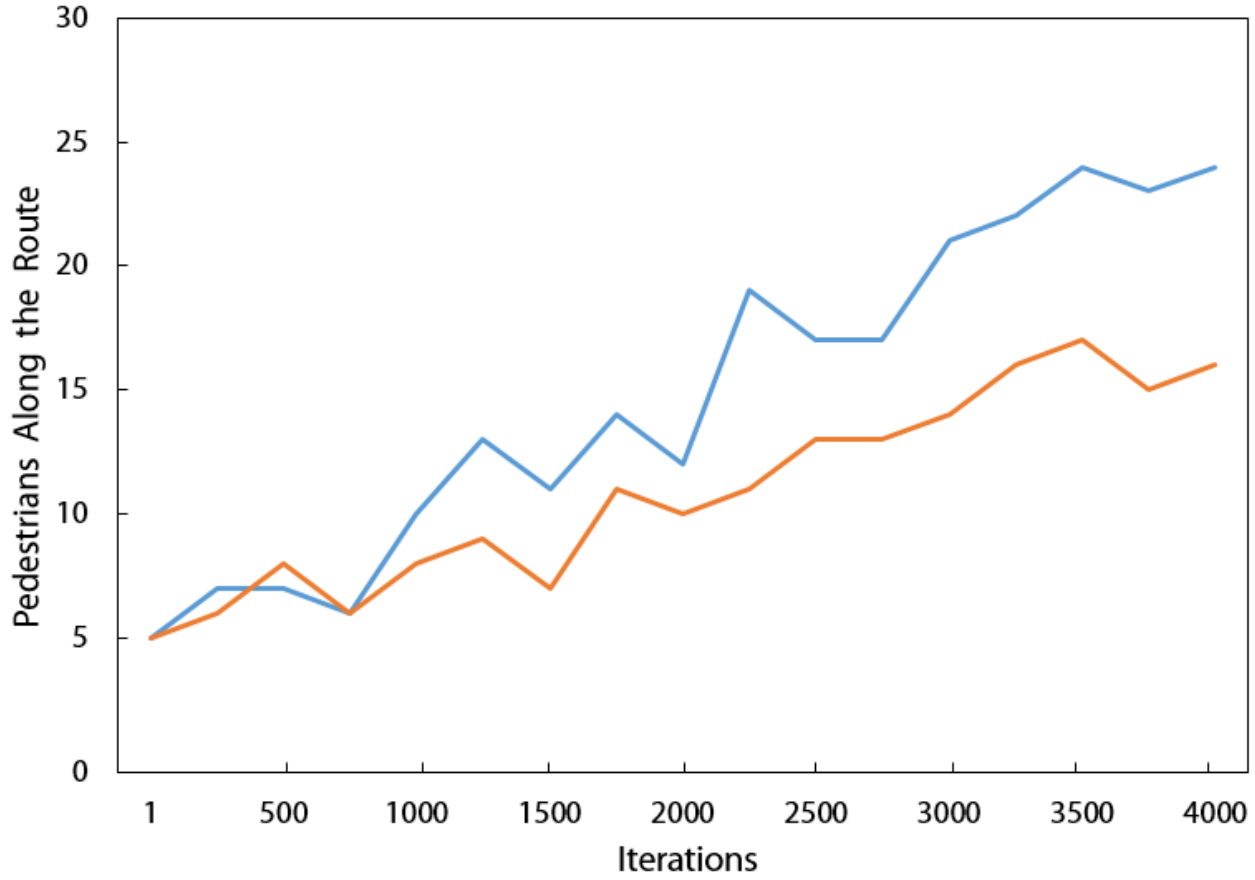
(b) Fewer Turns



(c) Pass Specified Positions

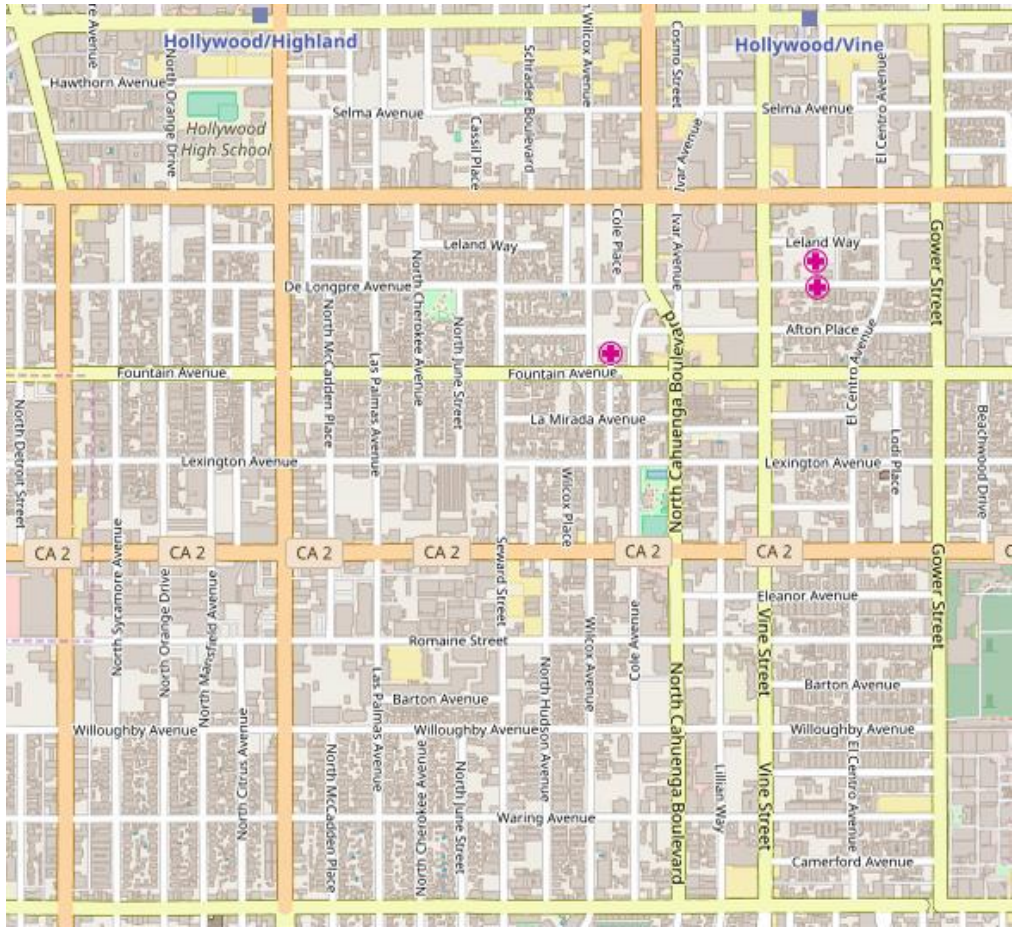
Other Synthesis Results

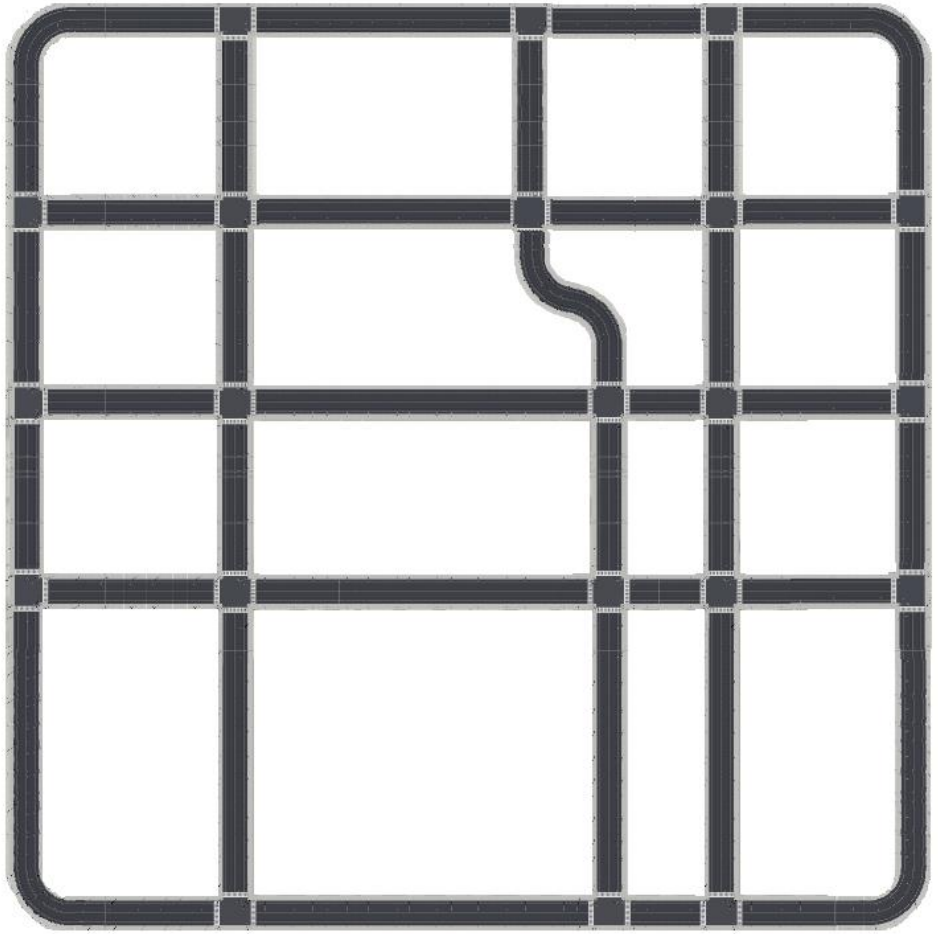




Training

City Used for Training





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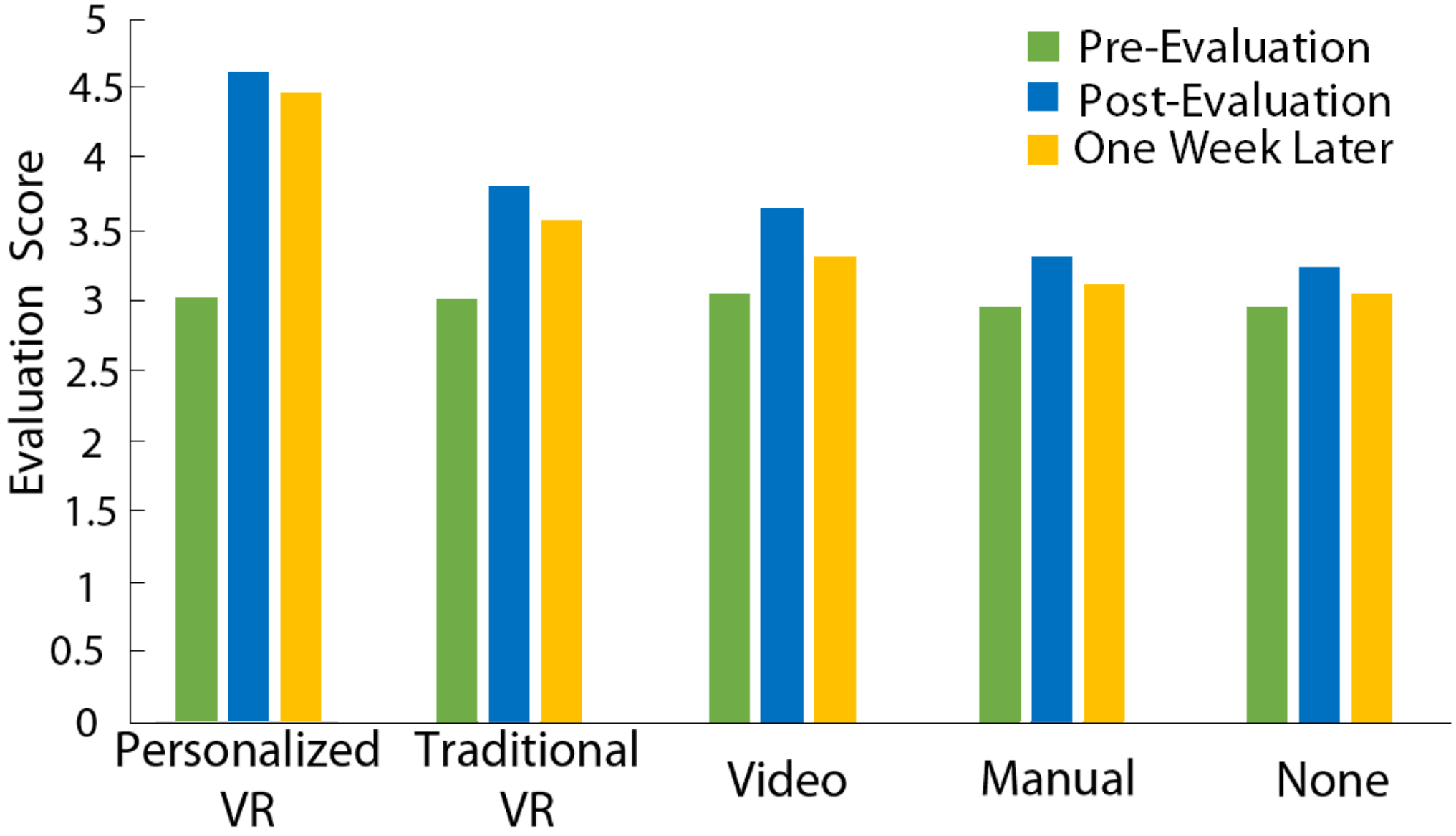
A Training Session

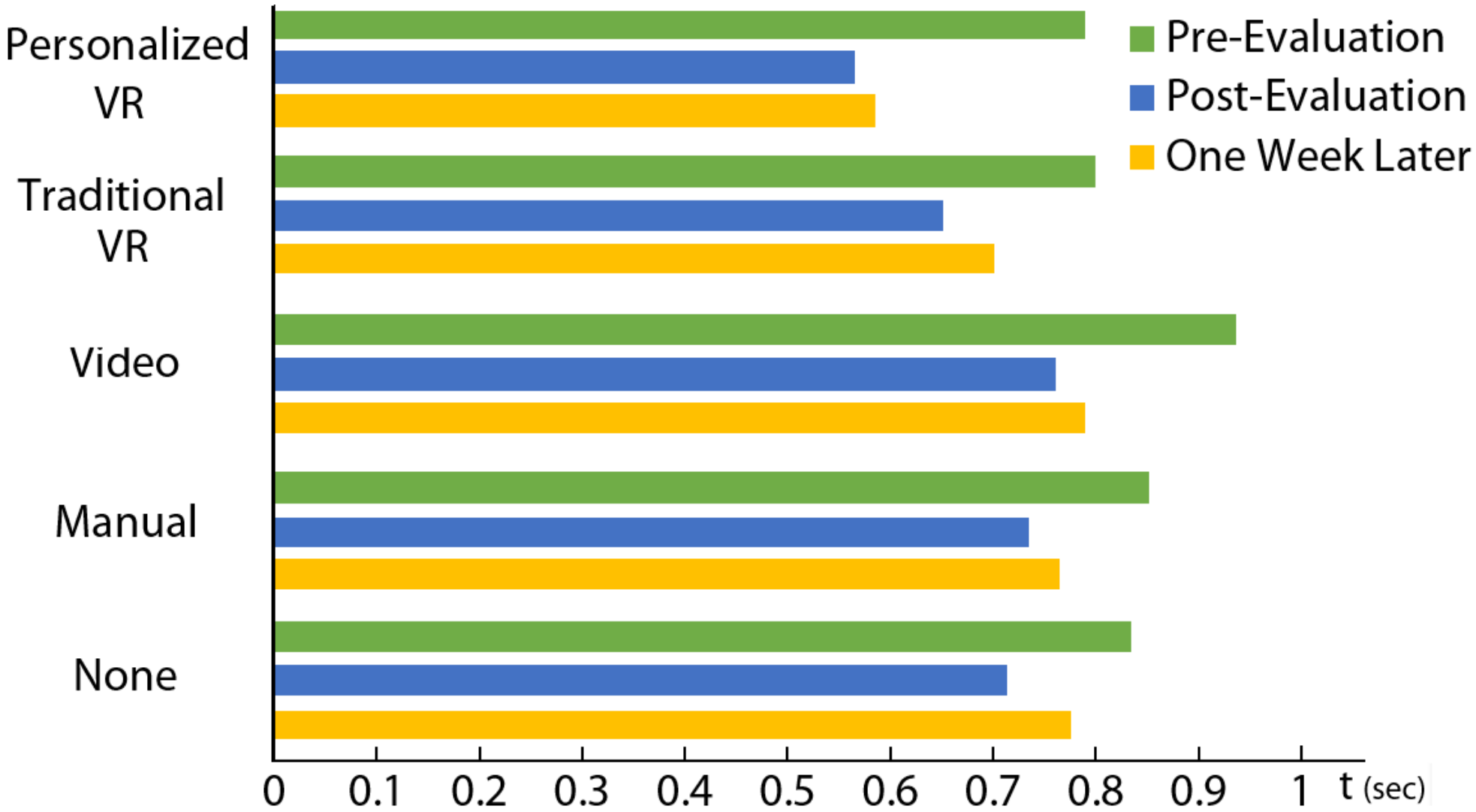
Eye-Tracking Result from FOVE

Results

Results


Evaluation Score
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
Pre-Evaluation
Post-Evaluation
One Week Later
Personalized VR
Traditional VR
Video
Manual
None

Results


Personalized VR
Traditional VR
Video
Manual
None
Pre-Evaluation
Post-Evaluation
One Week Later
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
t (sec)

Contribution

- **Propose an approach to synthesize personalized training programs.**
- **Demonstrate VR headsets can be employed for driving training.**
- **Evaluate our approach by comparing with other training methods.**

THANK YOU!

- **Project Page:**
- **http://www.bitliangwei.com/projects/Driving**

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