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Traffic Flow Simulation for Bike Traffic

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Background

Creating realistic virtual scene has always been a time consuming task. Not only building placement need to be realist, you also need to populate your city with props like stop signs and traffic light, pedestrians, cars, etc. Creating these scene can be quite complex if you want to have a coherent environment. Adding bicycles traffic in a scene requires you to think about the path the cyclist will take, the density of the traffic and a way to render realist models.

Problem

Render a simple "biking" scene with realist lightings, props and a well defined path for the bike. Procedurally generate bike traffic into the scene using the navigation framework provided by Unity3D. Use appropriate shading technique to render a realistic cyclist model. What kind of traffic density makes the scene realistic.

Implementation

Unity3D will be used for creating the biking scene. Blender will be used to adapt existing 3D models to our need. ShaderLab and CG will be used to write shaders for the cyclist model. C# scripting in Unity will be used to generate the bike traffic, but also to allow the user to change the scene parameters (traffic density, day/night, traffic speed) while the application is running.

Evaluation

For this project we will be evaluating the performance (i.e., the program can be runned at a reasonnable framerate on a regular laptop), we will also explore how our traffic algorithm could be improved by perceptual studies and what aspect are needed to make a realistic bike traffic scene.