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Special Topics Practical Course on Autonomous Driving

Starting the project

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1. Our city

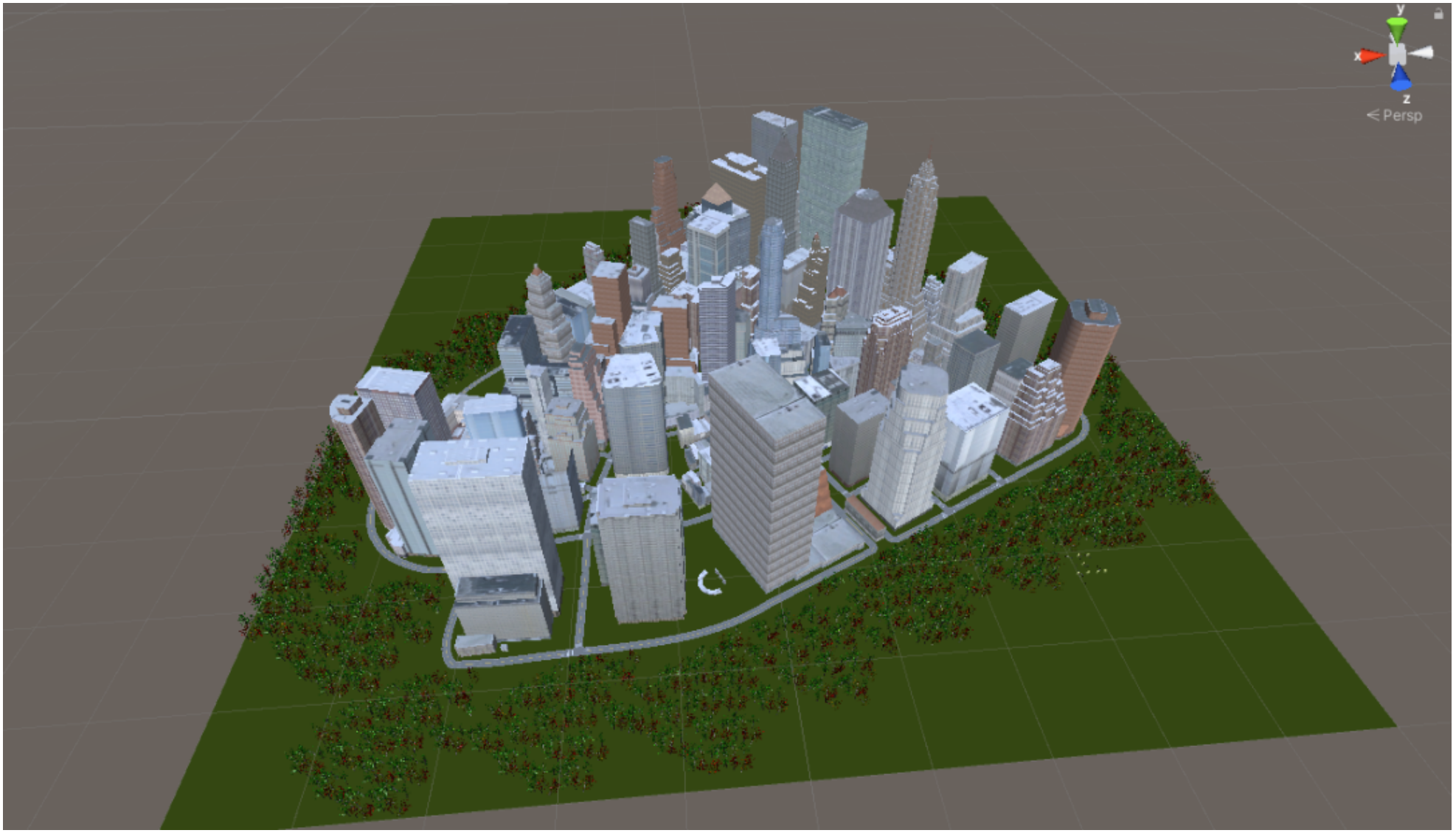
Overview over city

- Chosen city: Manhattan (New York)
- Used software:

  → City Engine for catching the city layout

  → Unity Hub to make use of the city in combination with our car and traffic

Looking of the city in Unity Hub



2. Traffic additions

Overview of what was done

- Implementation of traffic light script
- collision box: prevent cars from driving forward when the light is red
- placing the traffic lights within the city

3. The created car

Process of creating

- Challenges:

  → When importing the first own prefab car into the Unity Hub city it became rather unstable when changing its size.

  → Car always had the tendency to steer towards left

- Possible reason:

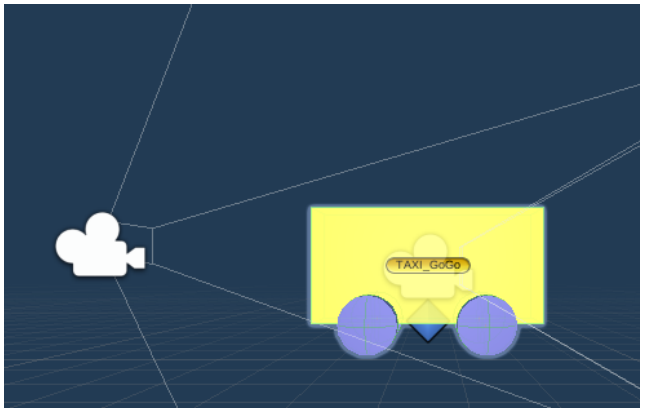
  The car‘s center and the pivot weren‘t in the same place. The pivot was always beside the car

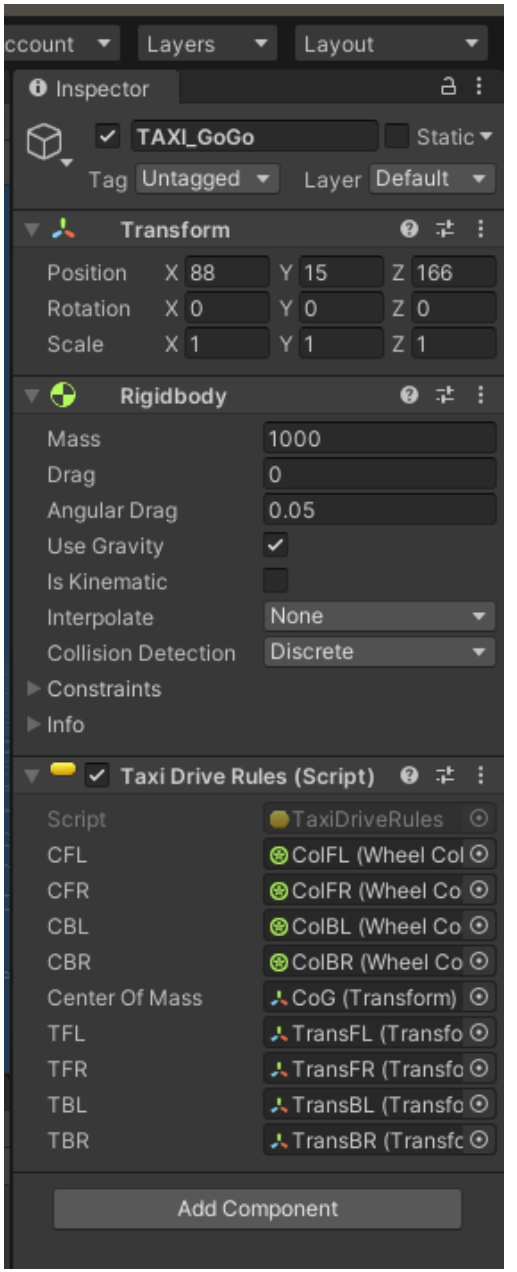
- Solution:

  creating a new car within the imported city in Unity Hub

Final car TAXI_GoGo

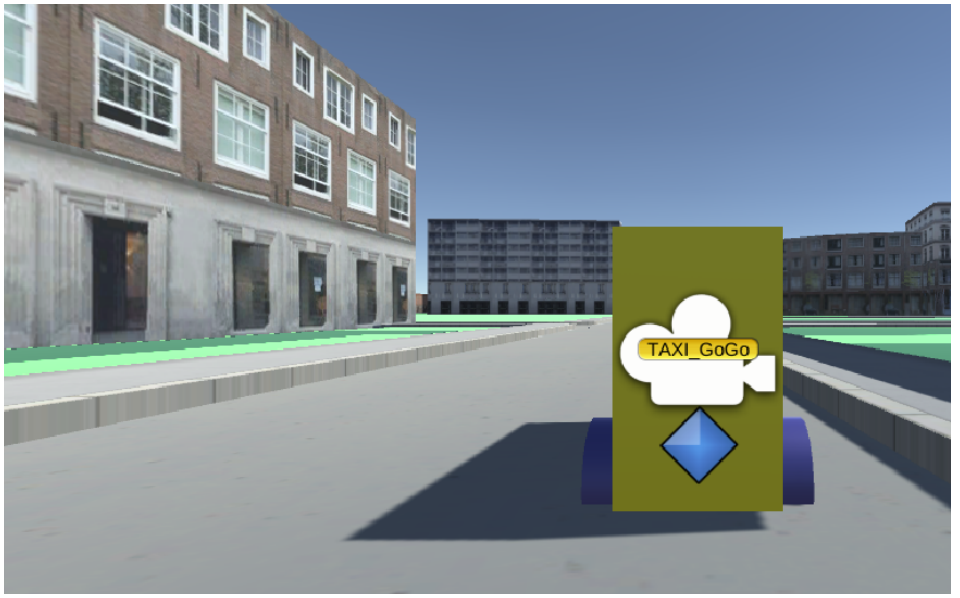
- Generated by following the course slides
- Components:
  - Wheel meshes
  - Wheel colliders
  - Wheel transfomers
  - Car body
  - Center of Gravity (blue diamond)
  - Two cameras following the car during simulation
  - Behavior script in C#

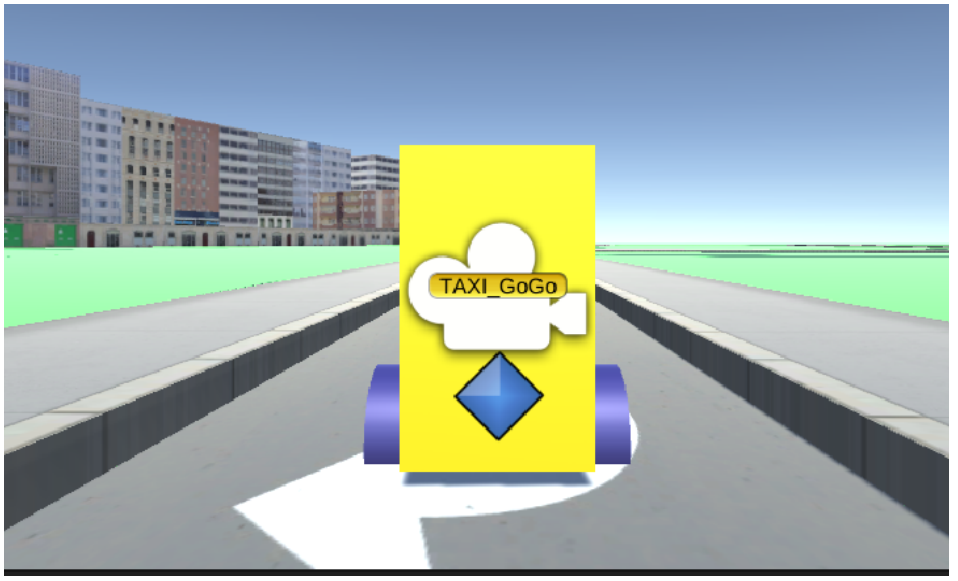




Final car TAXI_GoGo

- Properties:
  - Car is fast. Should it be too fast we can simply increase the „Mass“ under „Rigidbody“ of the object „TAXI_GoGo“
  - Car is narrow to avoid collisions with the oncoming traffic and fitting into narrow streets





4. Research topic

Two different traffic conditions

- Does the amount of traffic have an high impact on the learning process of our car?
- Does our car learn with medium traffic as good as when learing in a high traffic environment?
- E. g. report dealing with urban traffic: „Simulation of autonomous vehicles in an urban environment“ (Milger & Gillgren, 2015)

Thank you for your attention!