REALISTIC ENVIRONMENT MAPPING AND INTEGRATION TO UNITY 3D

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OVERVIEW

- Background
  - Why
  - What
  - Where

- Method
  - Flight Missions
  - Ground Mission
  - Processing

- Unity 3D
  - Generated Terrain
  - Detail Spawning
BACKGROUND
WHY?

PURPOSES:
- Develop and test autonomous vehicles
- Efficient testing of vehicles in different terrain types
- Safety Validation
BACKGROUND
WHAT?

REALISTIC 3D MODEL OF DIVERSE ENVIRONMENT

• Collecting aerial data with RGB camera
• Photogrammetric processing of data
• Integrating with Unity 3D
BACKGROUND
WHERE?

PILOT AREA: TalTech Campus

REASONING FOR CHOOSING:
• ISEAUTO Track
• Different types of buildings
• Urban details (Buildings, road signs, cars, vegetation etc.)
METHOD
FLIGHT MISSIONS

FLIGHT MISSIONS ARE PERFORMED ON THE SAME FLIGHT TRACK WITH CONSTANT ALTITUDE AND OVERLAPPING

• Grid Mission
• Overlap
• Different camera angles
FLIGHT MISSIONS
DIFFERENT ANGLES

a)  

b)
METHOD
DATA PROCESSING

PHOTOGRAMMETRIC PROCESSING CREATES DENSE POINT CLOUDS AND EVENTUALLY 3D MODEL

• Aligning of cameras
• Generating dense point cloud
• Classifying point clouds
  • For mask generation of different terrain details (Terrain type, vegetation etc.)
PROCESSING
GENERATED DENSE POINT CLOUD
PROCESSING
CLASSIFIED DENSE POINT CLOUD
UNITY 3D
UNITY TERRAIN
THANK YOU
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