

# Semester Project - Part 06

# Table of Contents

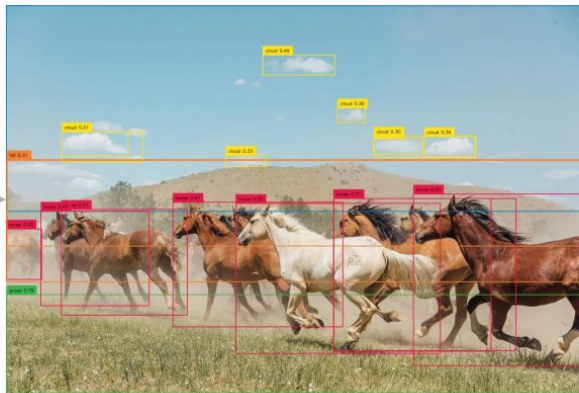
- Grounded-Segment-Anything
- GSAM and Optical Flow

# Grounded-Segment-Anything

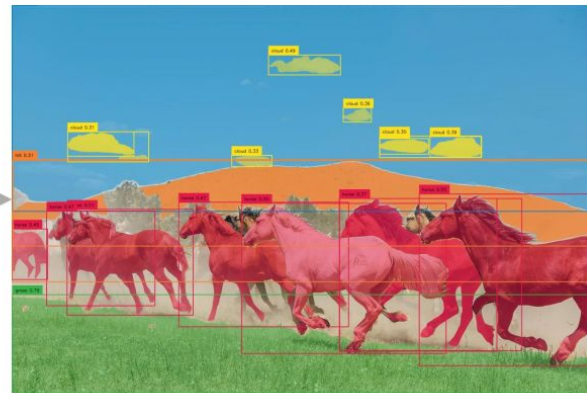
- Combines **Grounding DINO** and **Segment-Anything**
- Enables precise image segmentation **based on textual descriptions**
- **Zero-shot capability**



Text Prompt:  
“Horse. Clouds. Grasses. Sky. Hill.”



Grounding DINO:  
Detect Everything



Grounded-SAM:  
Detect and Segment Everything

# Grounded-Segment-Anything

- **Textual descriptions**

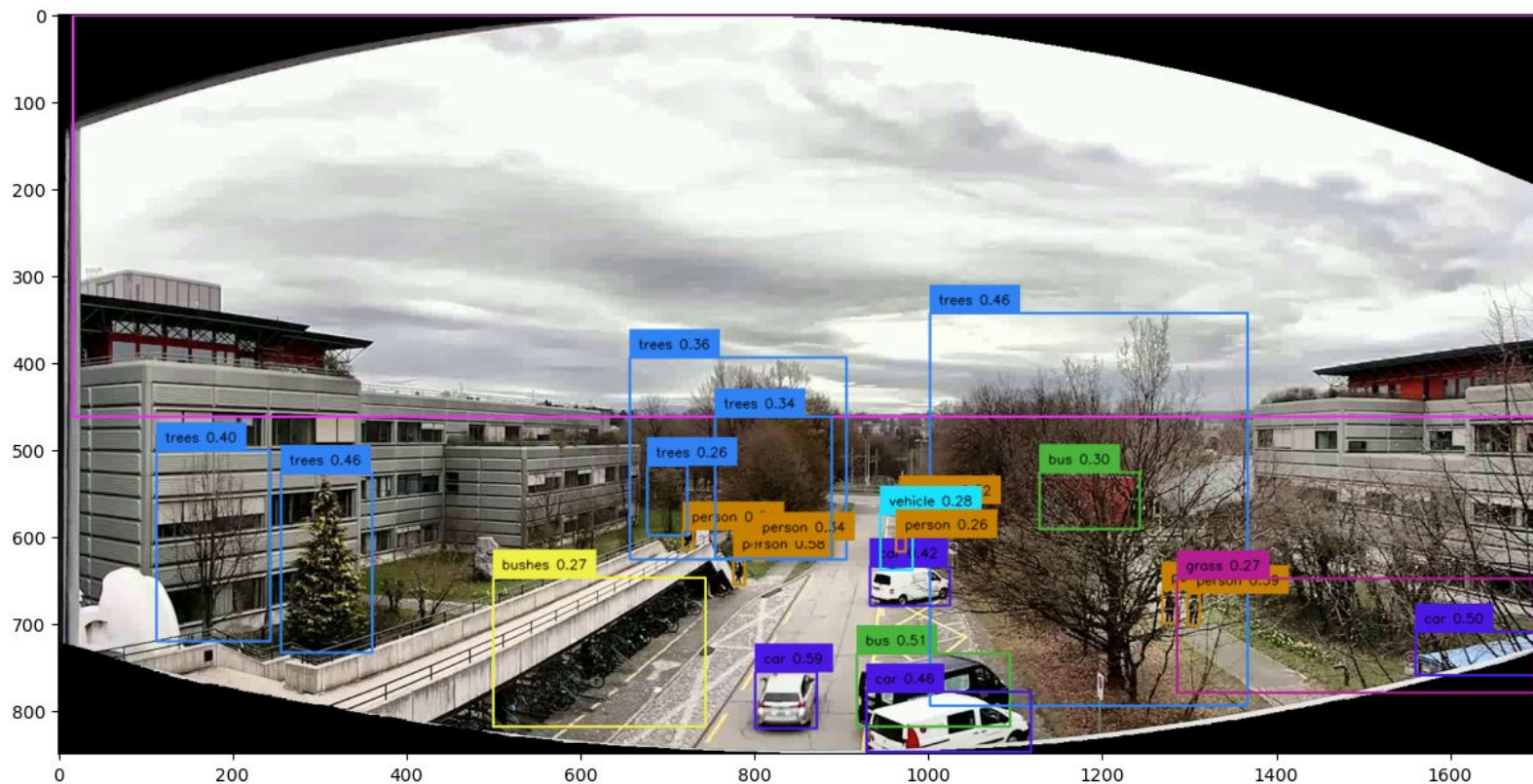
- |                                |   |            |
|--------------------------------|---|------------|
| ○ car, bus                     | ◆ | vehicle    |
| ○ person                       | ◆ | person     |
| ○ forest, trees, grass, bushes | ◆ | vegetation |
| ○ sky                          | ◆ | sky        |
| ○ buildings, None              | ◆ | background |

- Can also efficiently segment the sky

# Grounded-Segment-Anything - Scene 01 Example

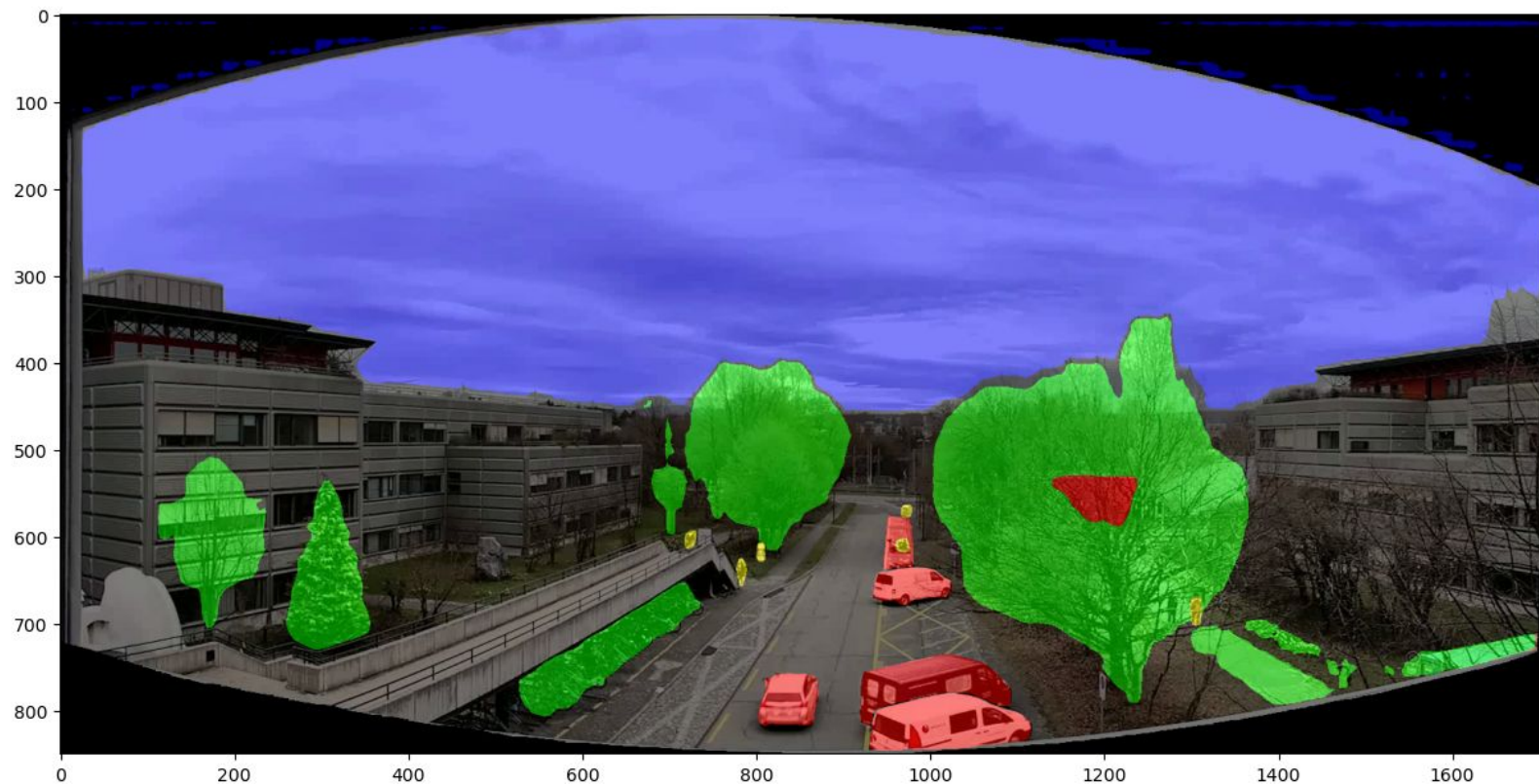


# Grounded-Segment-Anything - Scene 01 Example





# Grounded-Segment-Anything - Scene 01 Example



# GSAM & Optical Flow



# GSAM & Optical Flow

- Replace pre-trained **DeepLabV3** by **Grounded-Segment-Anything**
- For each object detected in the frame
  - Compute its mean optical flow magnitude
  - Add this value to the cumulative optical flow magnitude for the object's class
- **Avoids biased distributions** because of near or big objects

# Grounded-Segment-Anything - Scene 04 Example

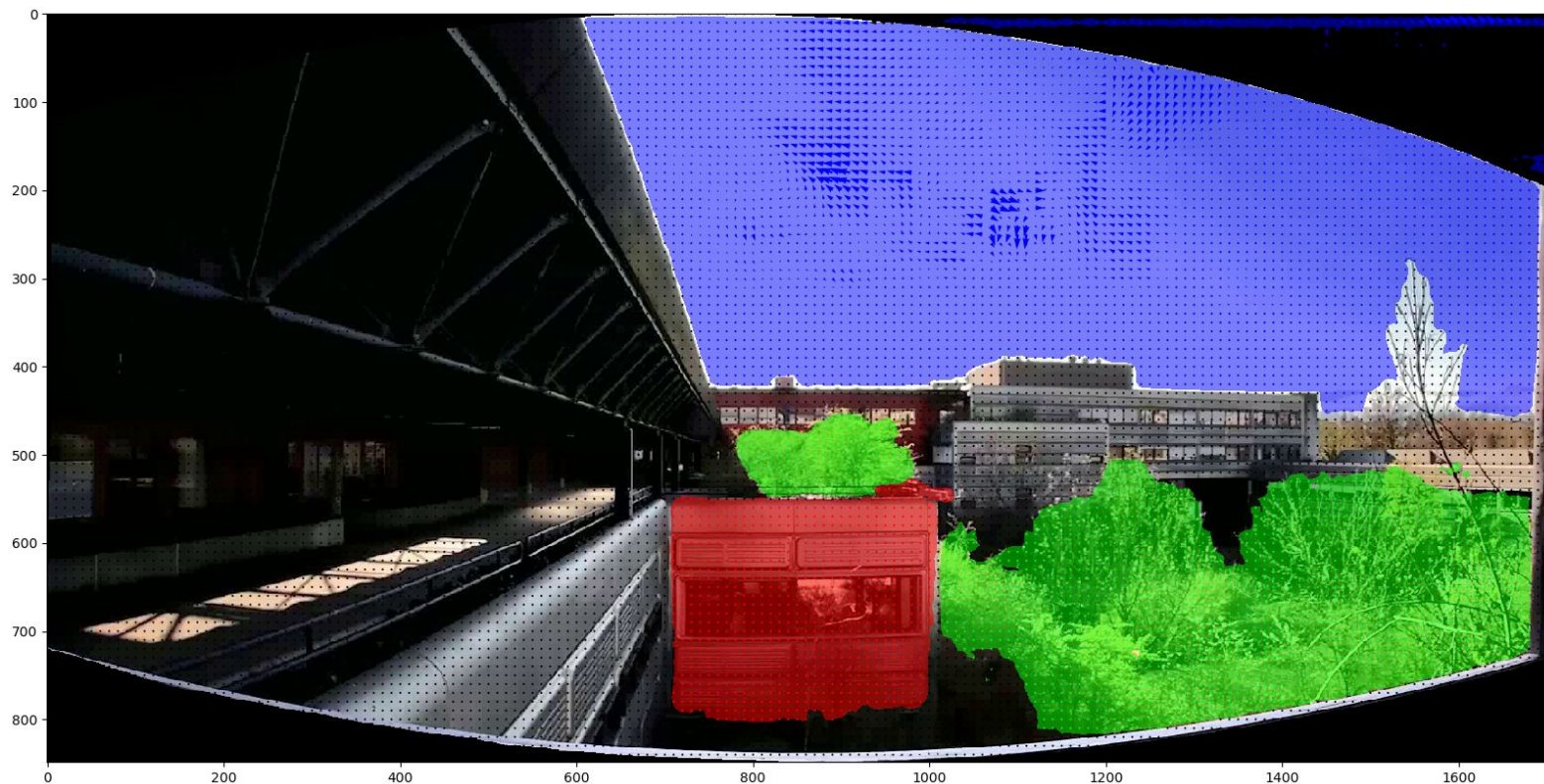




# Grounded-Segment-Anything - Scene 05 Example

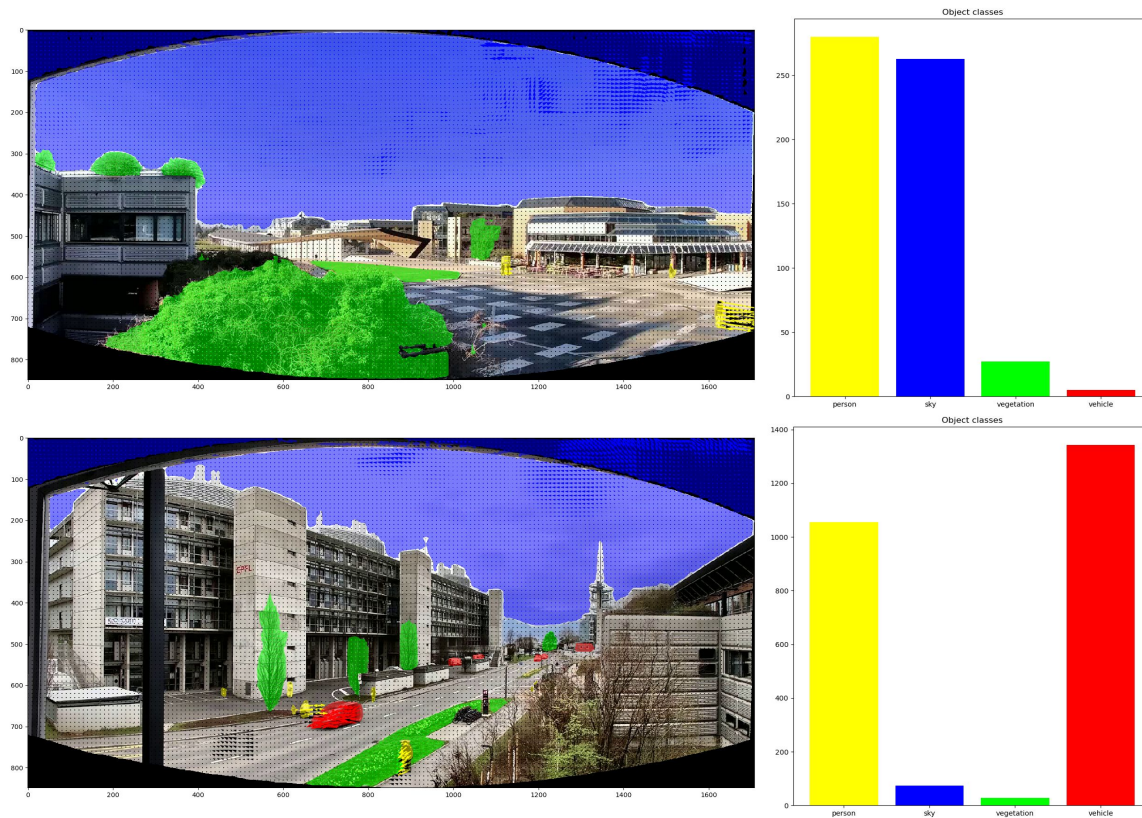

















# Grounded-Segment-Anything - Scene 15 Example





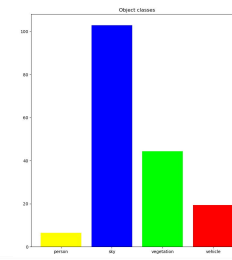
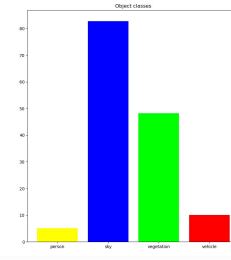
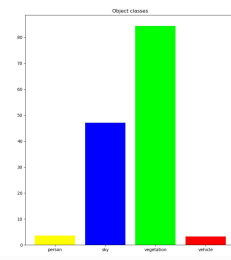
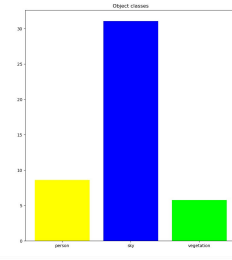
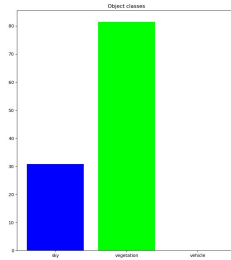
# GSAM & Optical Flow - Scene 03 and 05 Example



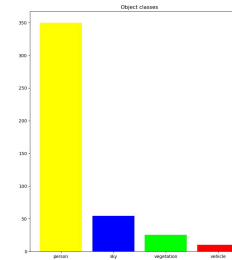
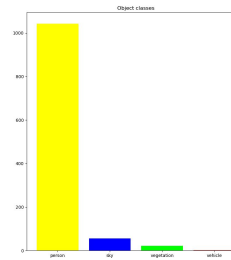
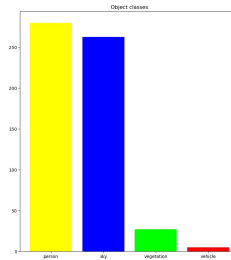
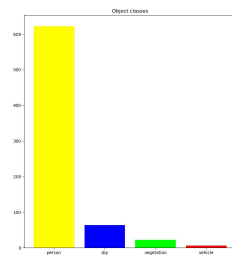
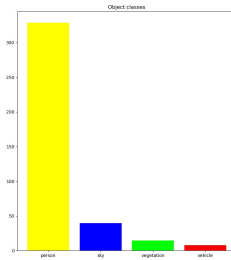
<p><b>Passive Movement</b></p>	<p><b>11</b></p>  <p>Daylight, clouds, wind</p>	<p><b>12</b></p>  <p>Daylight, clouds, wind</p>	<p><b>13</b></p>  <p>Daylight, clouds, wind</p>	<p><b>14</b></p>  <p>Daylight, clouds, wind</p>	<p><b>15</b></p>  <p>Daylight, clouds, wind</p>
<p><b>Passive Movement + People and Animals</b></p>	<p><b>2</b></p>  <p>People + cyclists (high density), birds, clouds</p>	<p><b>4</b></p>  <p>People + cyclists (medium density), birds, clouds</p>	<p><b>5</b></p>  <p>People (medium density), wind, birds</p>	<p><b>6</b></p>  <p>People + cyclists (medium density), birds, clouds</p>	<p><b>10</b></p>  <p>People + cyclists (medium density), wind, clouds</p>
<p><b>Passive Movement + People and Animals + Road traffic</b></p>	<p><b>1</b></p>  <p>People + cyclists, cars (low density), bus, metro, clouds</p>	<p><b>3</b></p>  <p>People + cyclists, cars (high density), motorcycles</p>	<p><b>7</b></p>  <p>People + cyclists, cars (low density), bus, metro, clouds</p>	<p><b>8</b></p>  <p>People + cyclists, cars (high density), metro, bus</p>	<p><b>9</b></p>  <p>People + cyclists, cars (medium density), clouds</p>



## Passive Movement



## Passive Movement + People and Animals



## Passive Movement + People and Animals + Road traffic

