Semester Project - Part 02

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Global Lighting Evaluation

Global Lighting Evaluation - Methods

- Computed **statistical properties** between video frames

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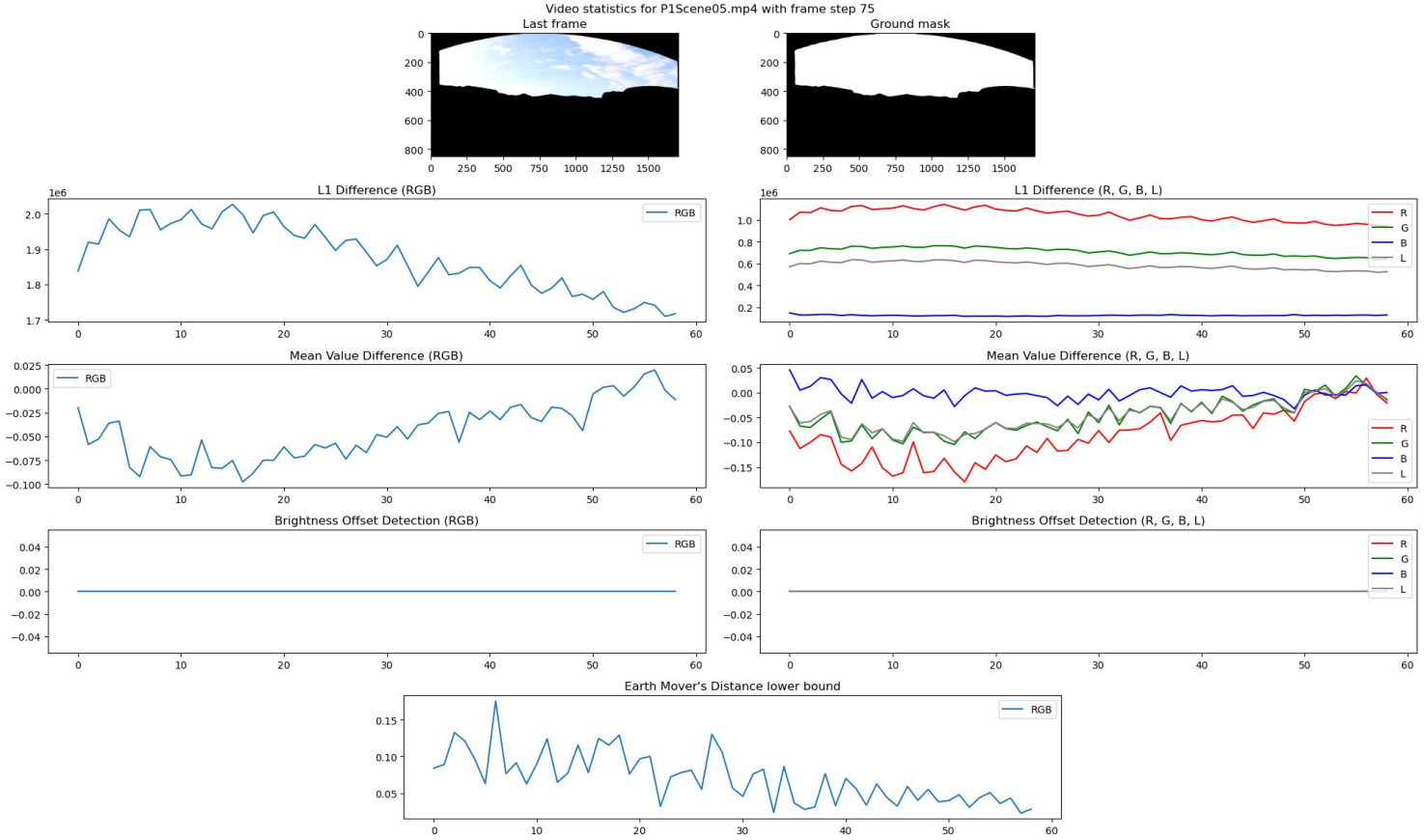
- Every **75 frames** (3-second intervals)

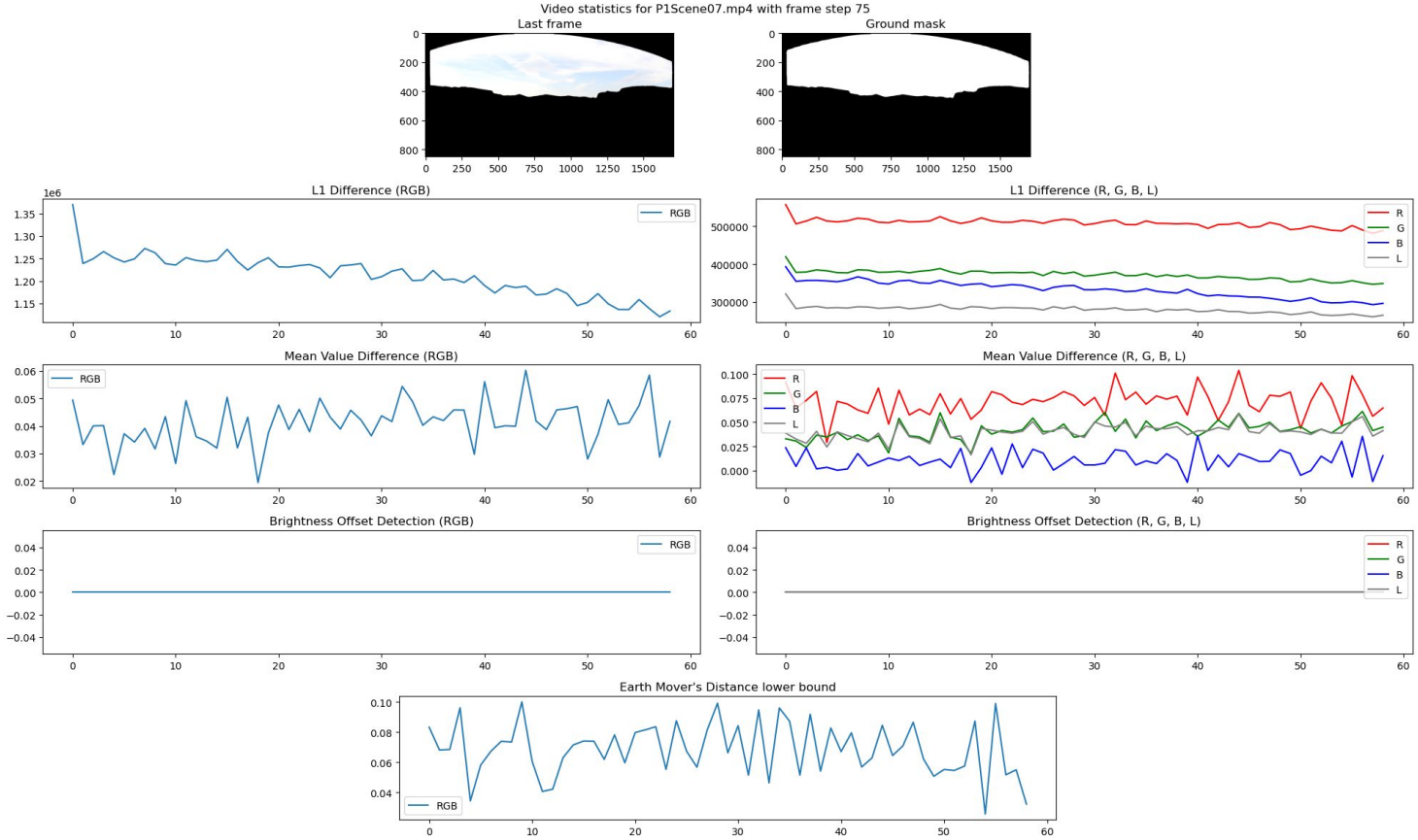
Global Lighting Evaluation - Methods

- Computed statistical properties between video frames
- Every 75 frames (3-second intervals)
- Statistical evaluations
  - **L1 Difference** measuring the absolute differences in pixel values between consecutive frames
  - **Mean Value Difference** computing the average pixel value to track gradual changes
  - **Brightness Offset Detection** using histogram peak detection to pinpoint shifts in overall scene brightness
  - **Earth Mover’s Distance** capturing the dissimilarity between two sequential frame histograms

Global Lighting Evaluation - Scene 05 Example



Global Lighting Evaluation - Scene 07 Example



Dual-Zone Lighting Evaluation

Dual-Zone Lighting Evaluation - Methods

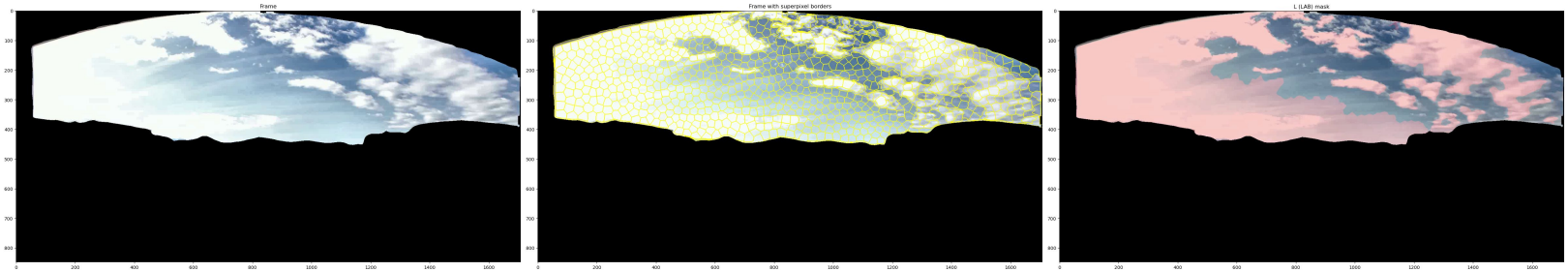
- Segmenting the sky into **light/dark zones** using **Otsu’s method** on L channel from LAB

Dual-Zone Lighting Evaluation - Methods

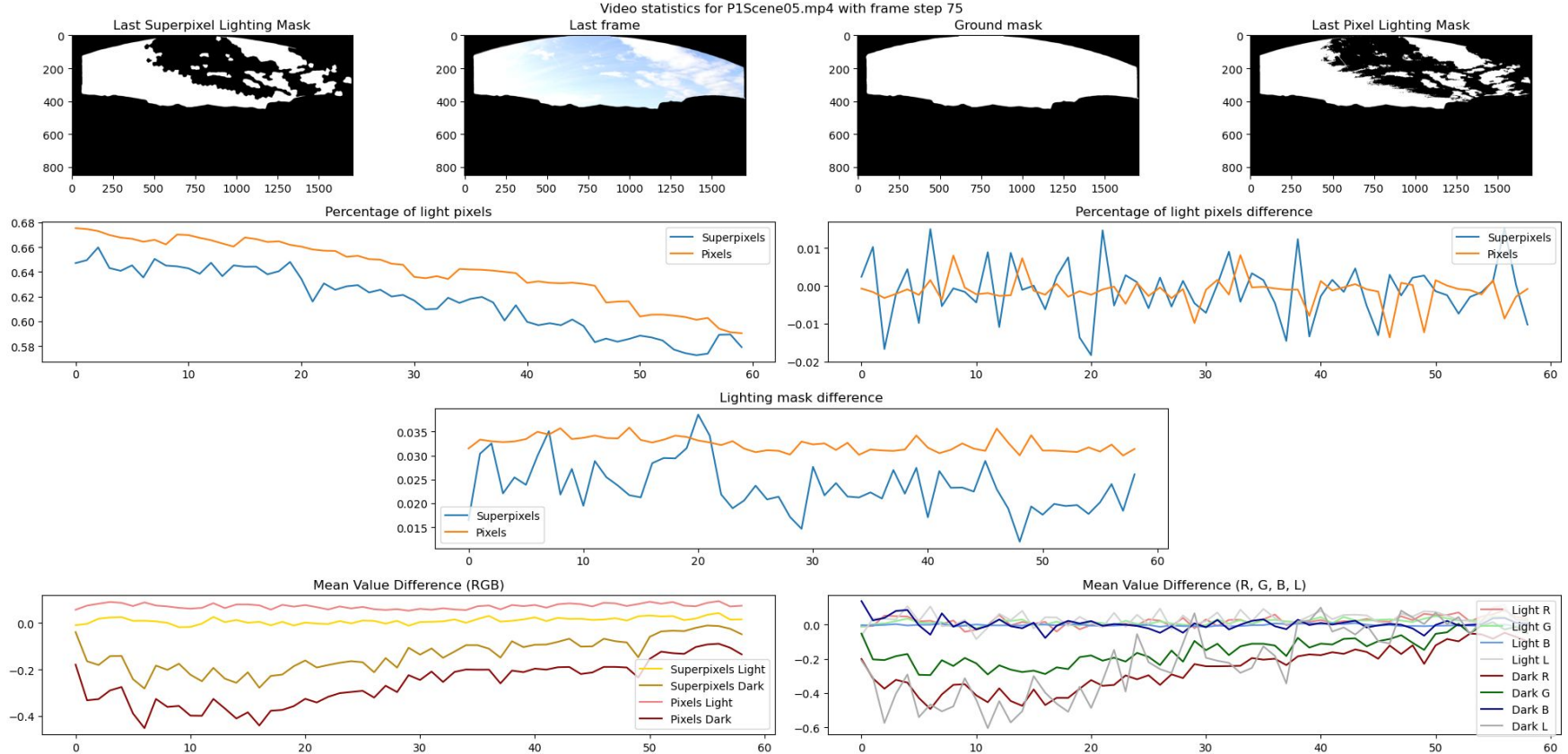
- Segmenting the sky into light/dark zones using Otsu’s method on L channel from LAB
- Applied at Different Granularity (**superpixel** and **pixel** level)

Dual-Zone Lighting Evaluation - Methods

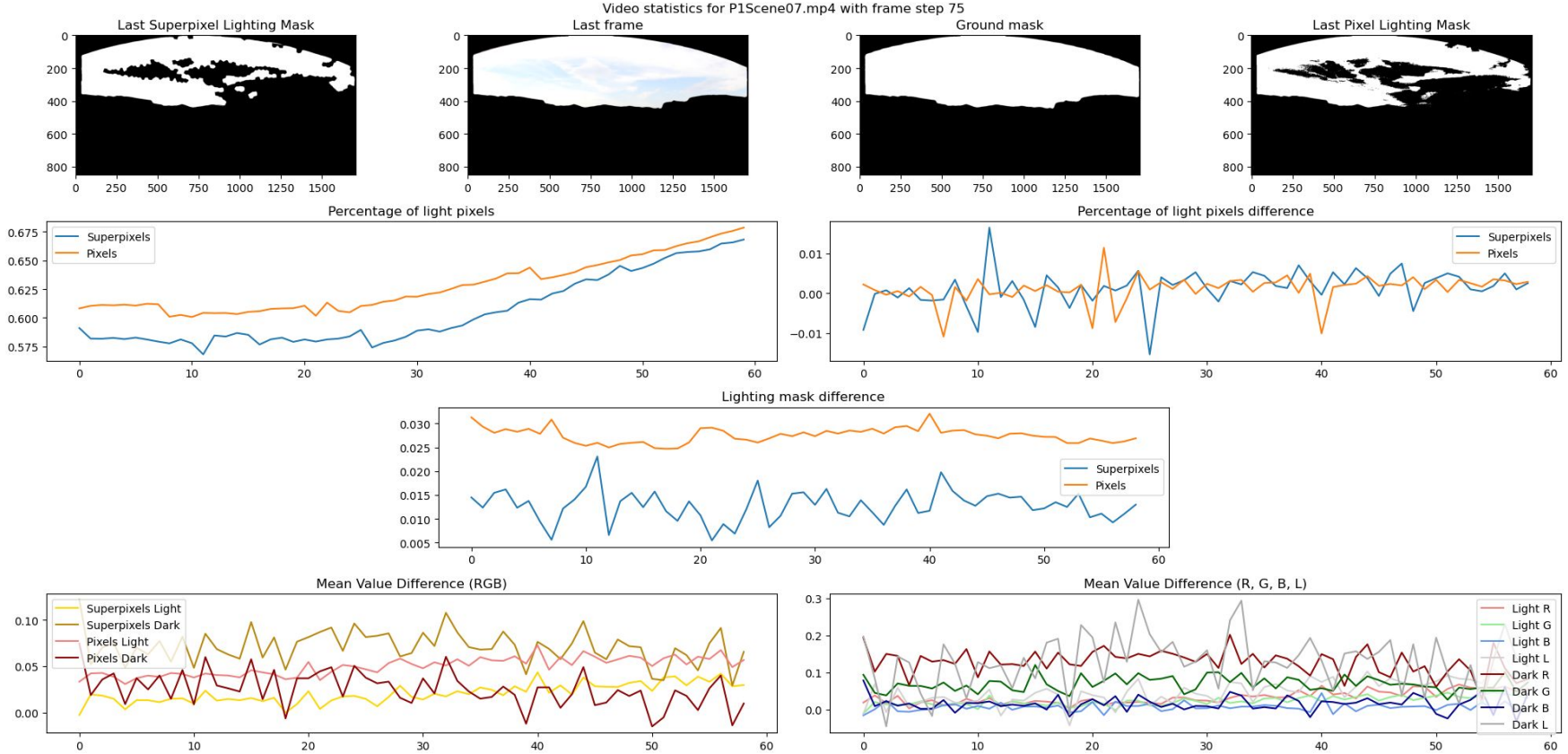
- Segmenting the sky into light/dark zones using Otsu’s method on L channel from LAB
- Applied at Different Granularity (superpixel and pixel level)
- Statistical evaluations
  - **Percentage** of light pixels
  - **Signed Difference** in percentage of light pixels
  - **L1 Difference** between lighting masks
  - **Mean Value Difference** for light/dark areas



Superpixel-Level Lighting Analysis - Scene 05 Example



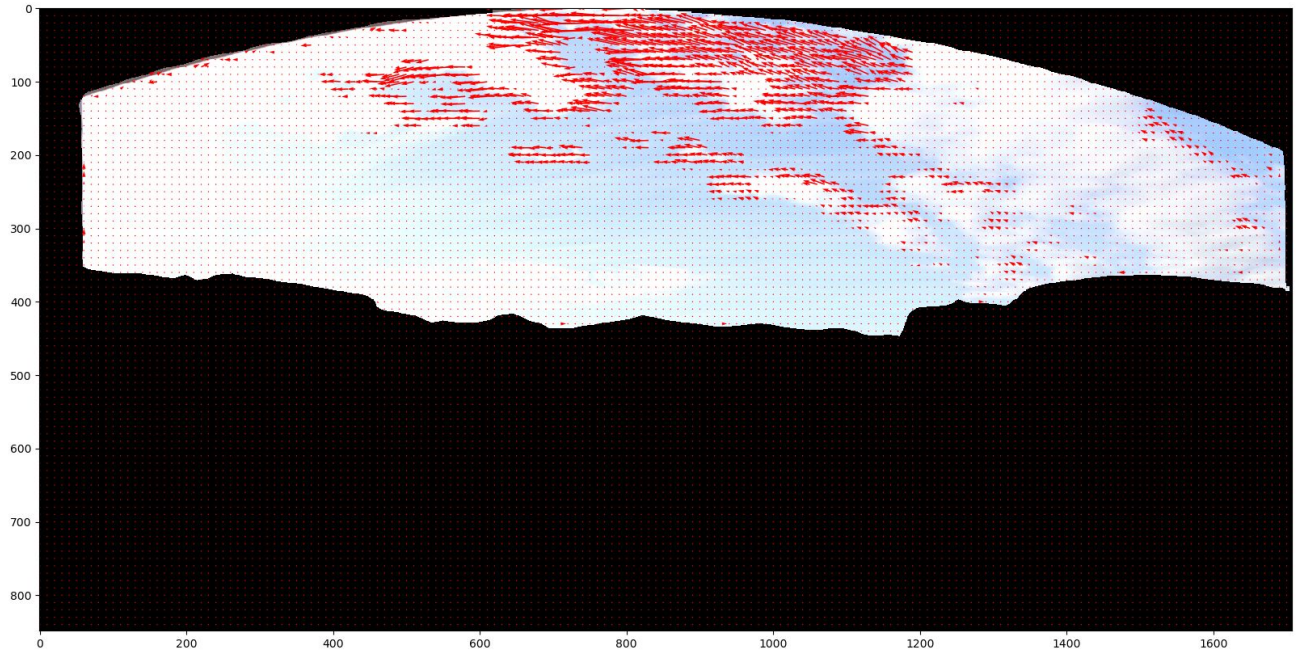
Superpixel-Level Lighting Analysis - Scene 07 Example



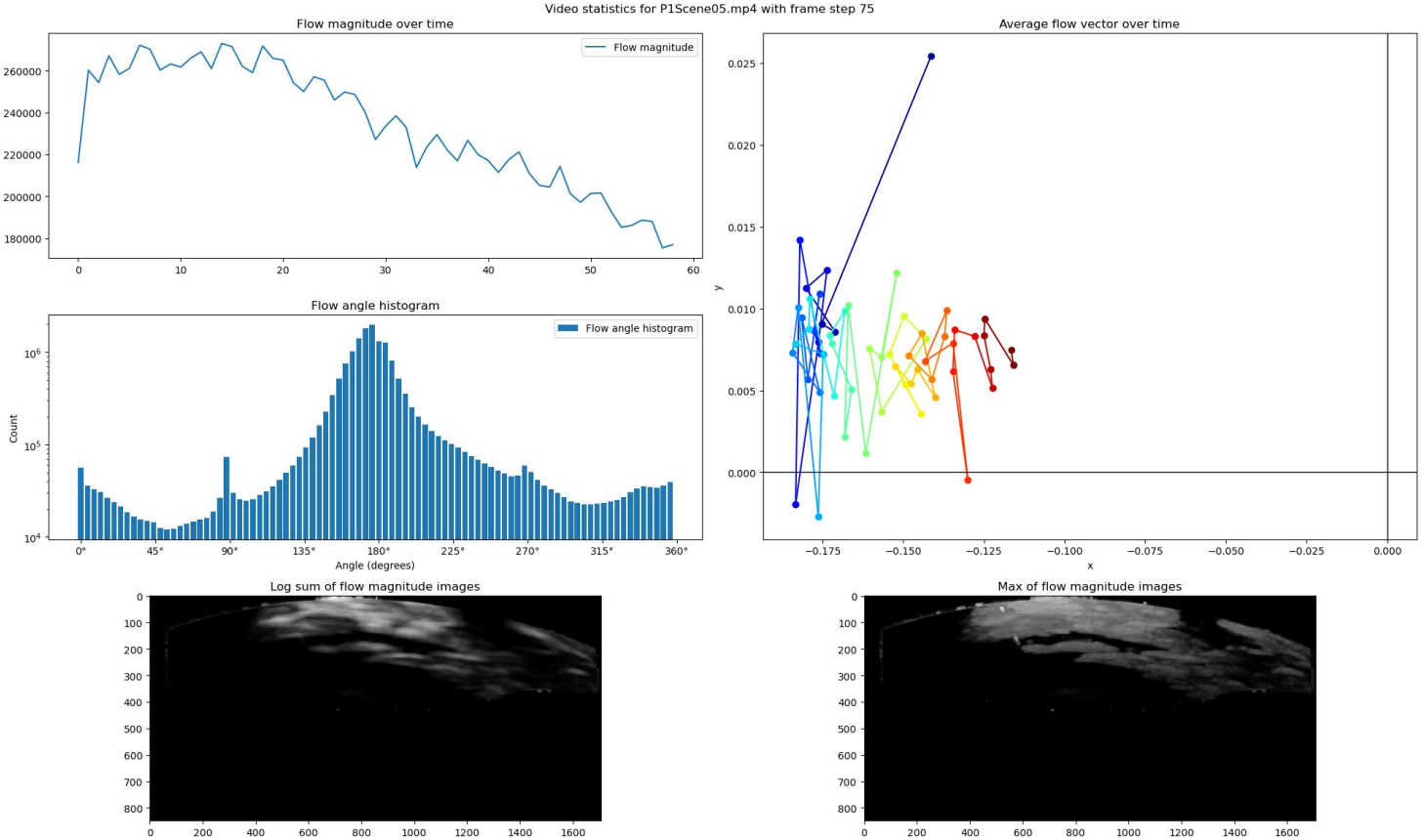
Optical Flow

Optical Flow - Farneback Algorithm

- Obtain optical flow vectors from consecutive frames using the L channel of the LAB color space



Optical Flow - Scene 05 Example



Optical Flow - Scene 07 Example