Human Attention Experiments for Evaluation of Multi-Camera Video Summarizations

Joseph Minter
Cosumnes River College
Computer Engineering
Mentor: Carter De Leo
Faculty Advisor: B.S. Manjunath

Observational Cameras

- Found everywhere
- Record for hours at a time
- Not all data is useful
- Viewing process becomes very tedious and inefficient

Cartoonstock
Afternoon News

Understanding Human Attention

- Define what variables govern human interest
- Automated process that predetermines what is worth showing to the viewer

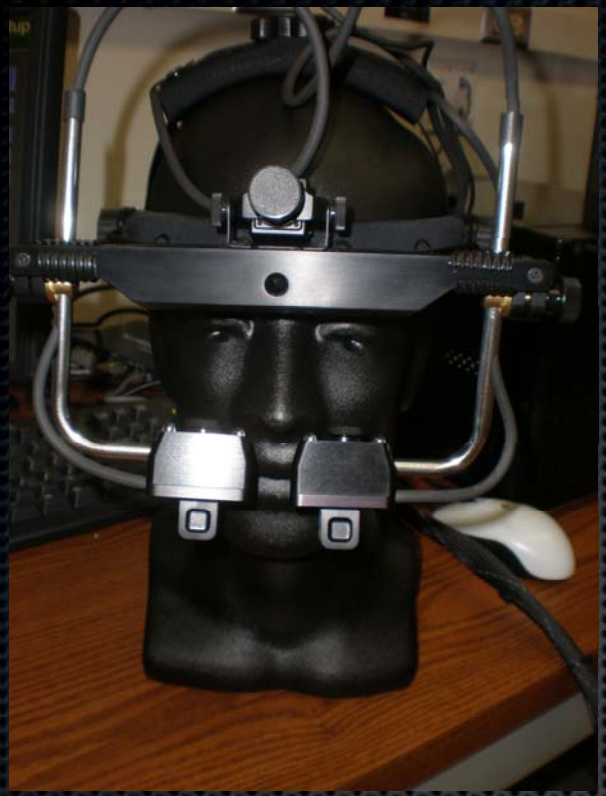
Fotosearch

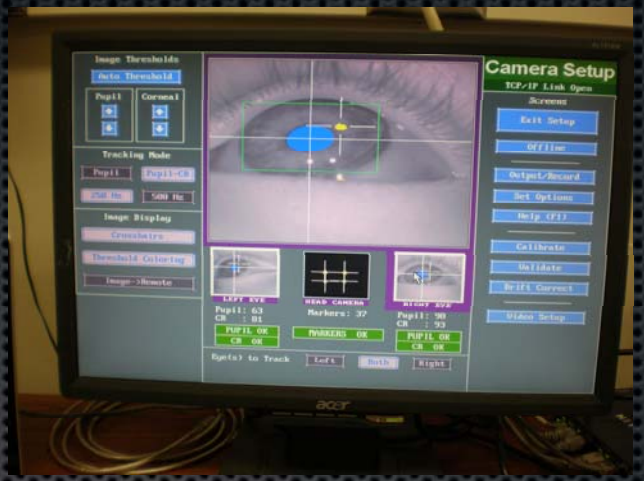
HUMAN ATTENTION EXPERIMENTS

To understand human gaze patterns while watching multi-camera observational video

Hypothesis

- Summaries should be predominantly based on anomalies
- Viewer spend more time on anomalies in a video
- There is a link between fixation length and interest
- Longer Fixation = Greater Interest

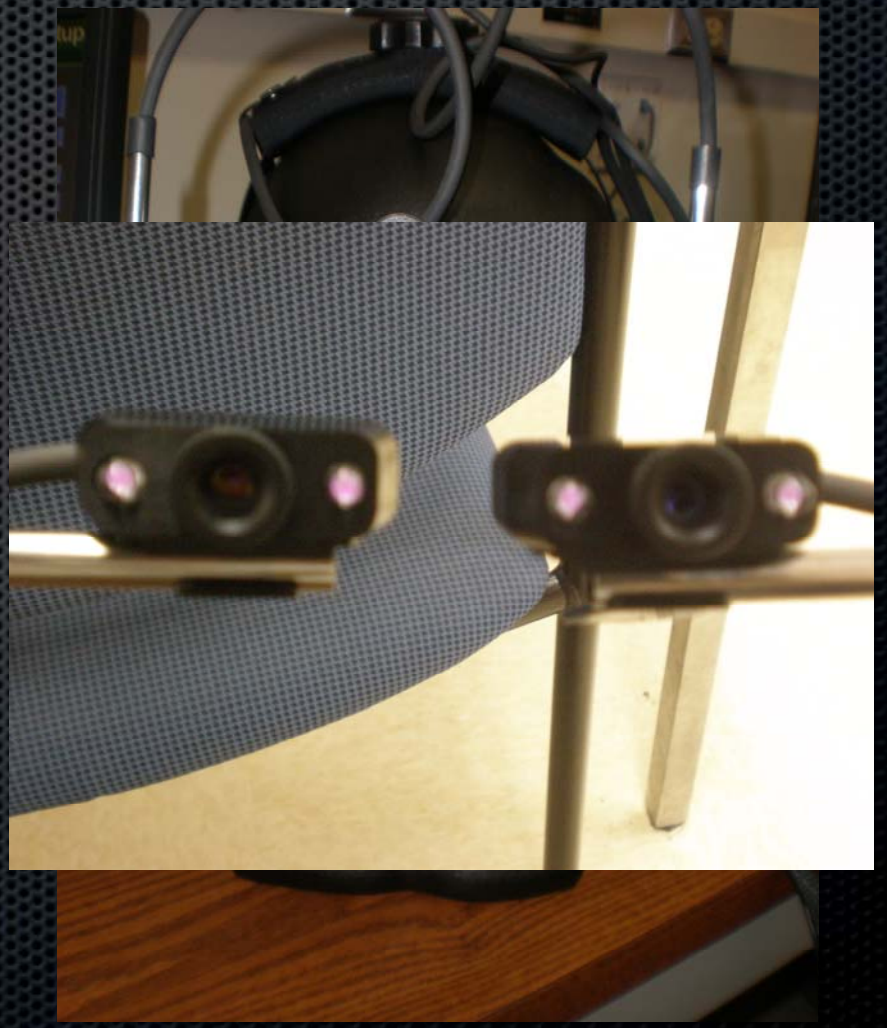



Camera Setup
Exit Setup
Offline
Calibrate
Validate
Drift Correct
Video Setup

Equipment

Eye Link II

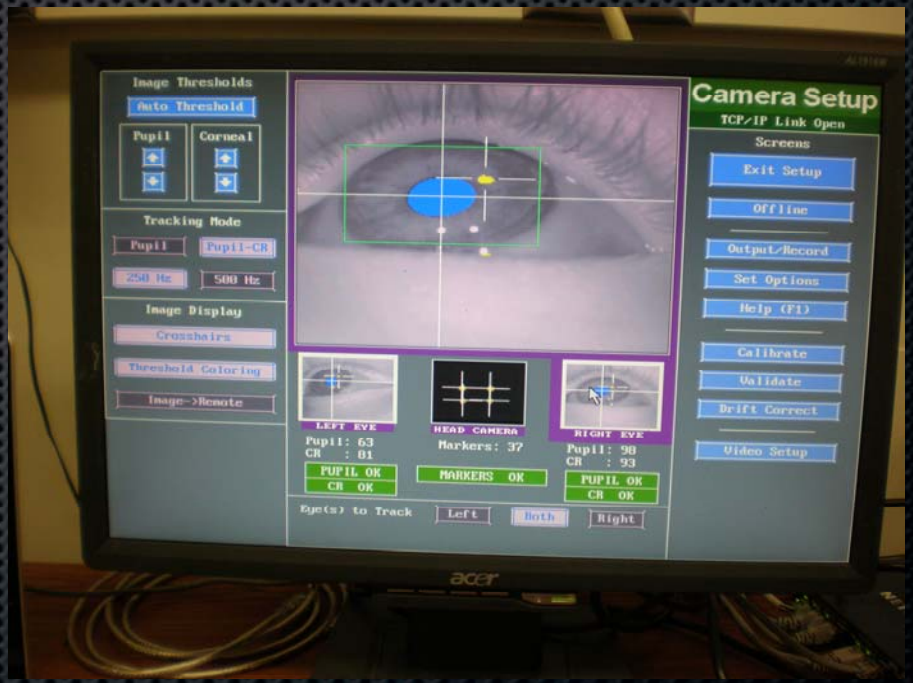
- Head mounted eye tracker
- Cameras that hang below eyes
- Records where a viewer is looking




Instant
Cool
Points

Host Computer

- Carries the Eye Link II Operating System
- Controls eye tracker and its settings



Display Monitor

- Displays visual stimulus i.e. video
- Rigged with markers for alignment with eye tracker

Controller

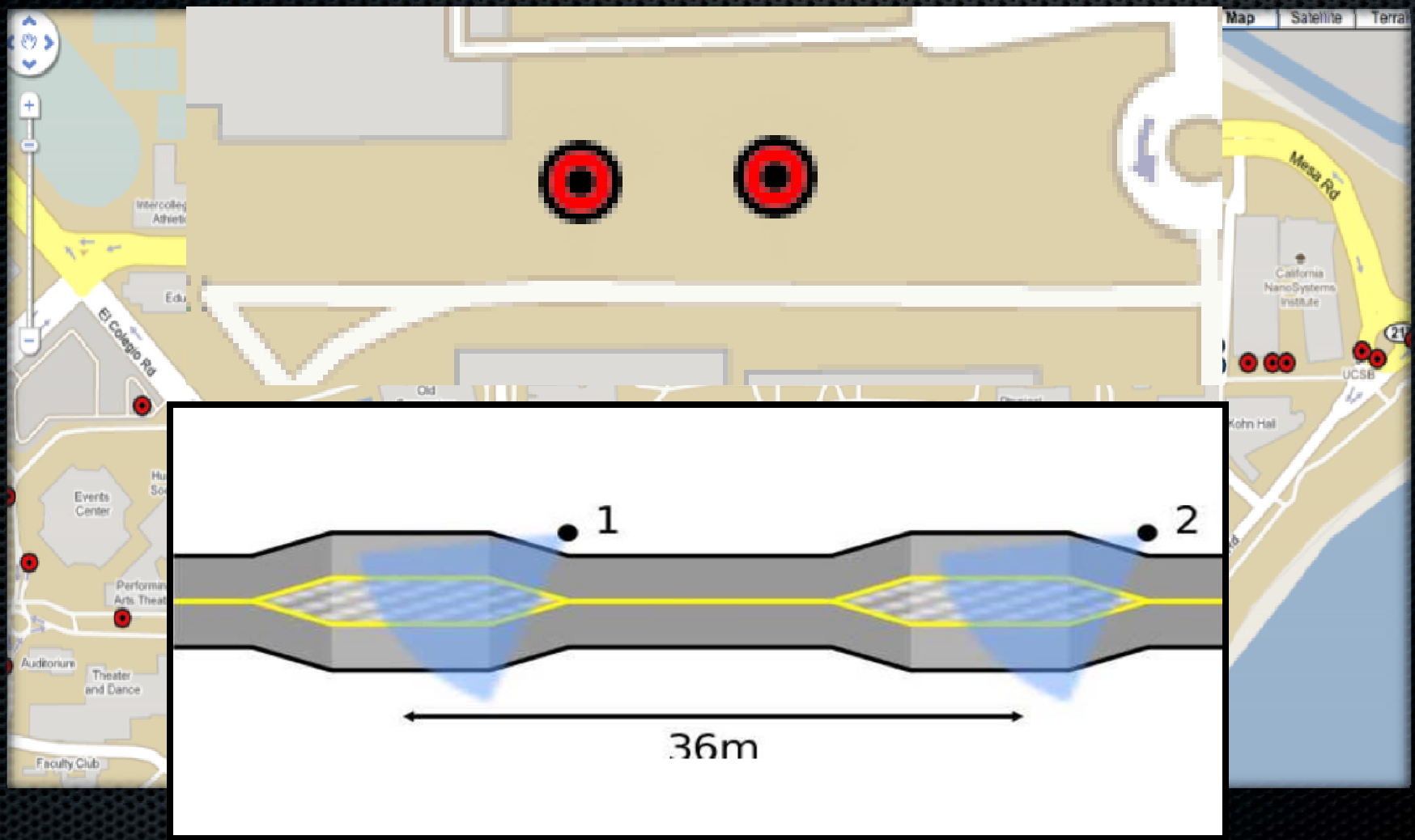
- Used for viewer input
- Using the right and left triggers only

Experimental Method

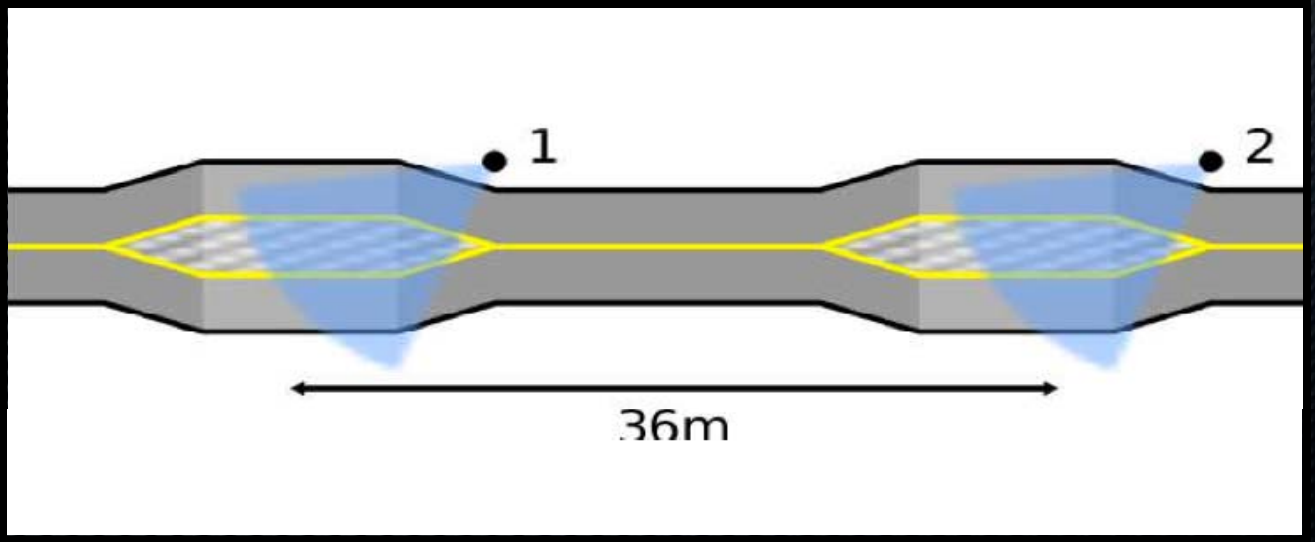
General Procedure

- Gathered a collection of people to run experiments on
- Rig each person with the eye tracker
- Display the visual stimulus using the display monitor
- Record their fixations points while watching stimulus

Video in Experiment



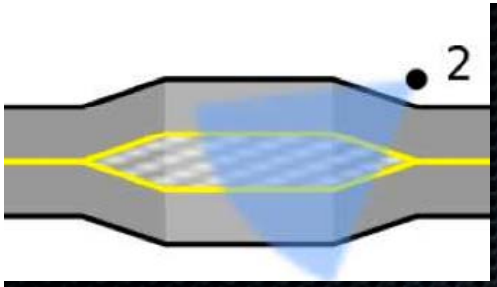
Video in Experiment



Experiment Groups

- Control
  - Single Video

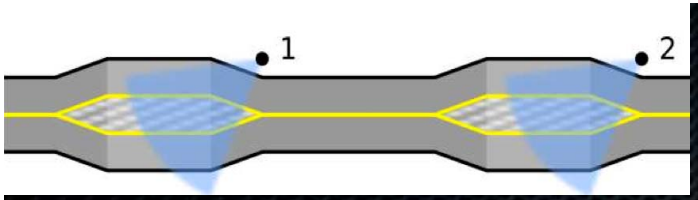
- Experimental
  - Two Videos Simultaneously



Control

Press right trigger for each cyclist that goes down path

For each mistake press the left trigger



Experimental

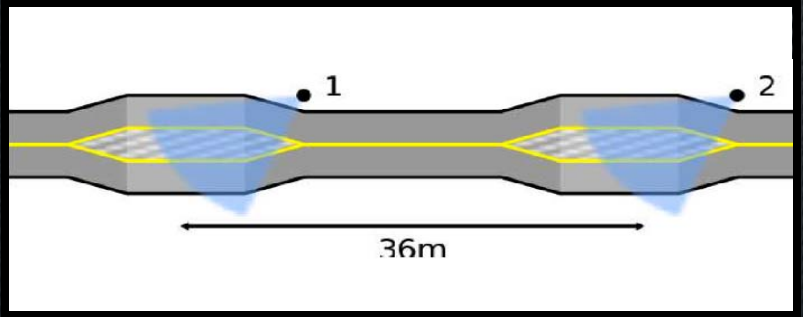
press right trigger for each cyclists that go from cameras 1 to 2

For each mistake press the left trigger

Anomalies in Experimental Video

Original

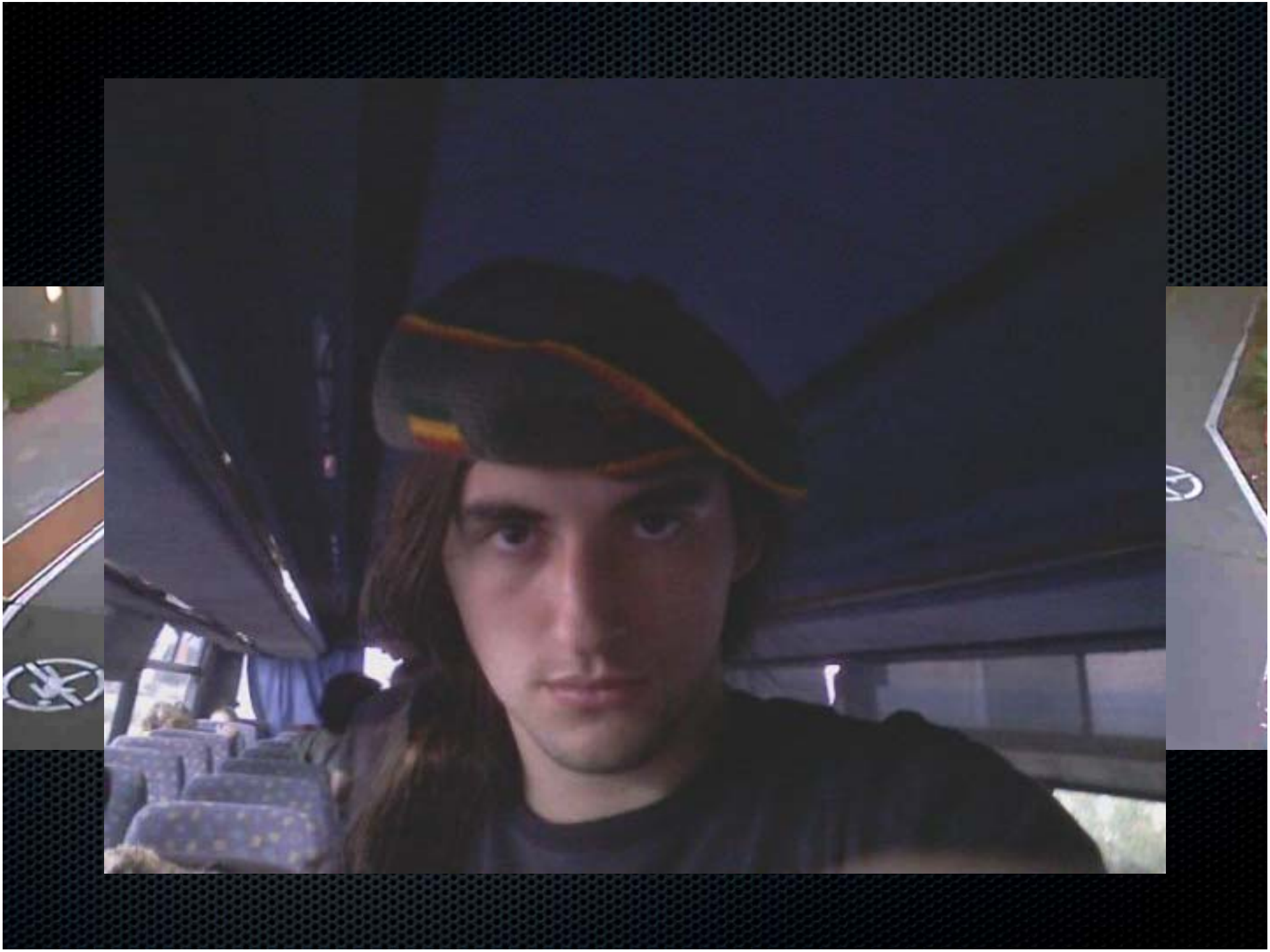
Edited



Point of the Control Group

To validate that longer fixation lengths were really due to the anomalies and not by some other artifact done by the editing of the experimental video

Data



Fixations

The Next Steps

- Compare fixation lengths on cyclist vs. anomalies
- Determine if data justifies assumption
- Construct an algorithm based on patterns discovered
- Create a program that can identify significant video data to present to the viewer

Acknowledgments

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Participants of Our Experiments

Questions?


Record
DELL


LOCKED OUT
M=37
P=98 CR=93