Tracker

CS 293

DEMO

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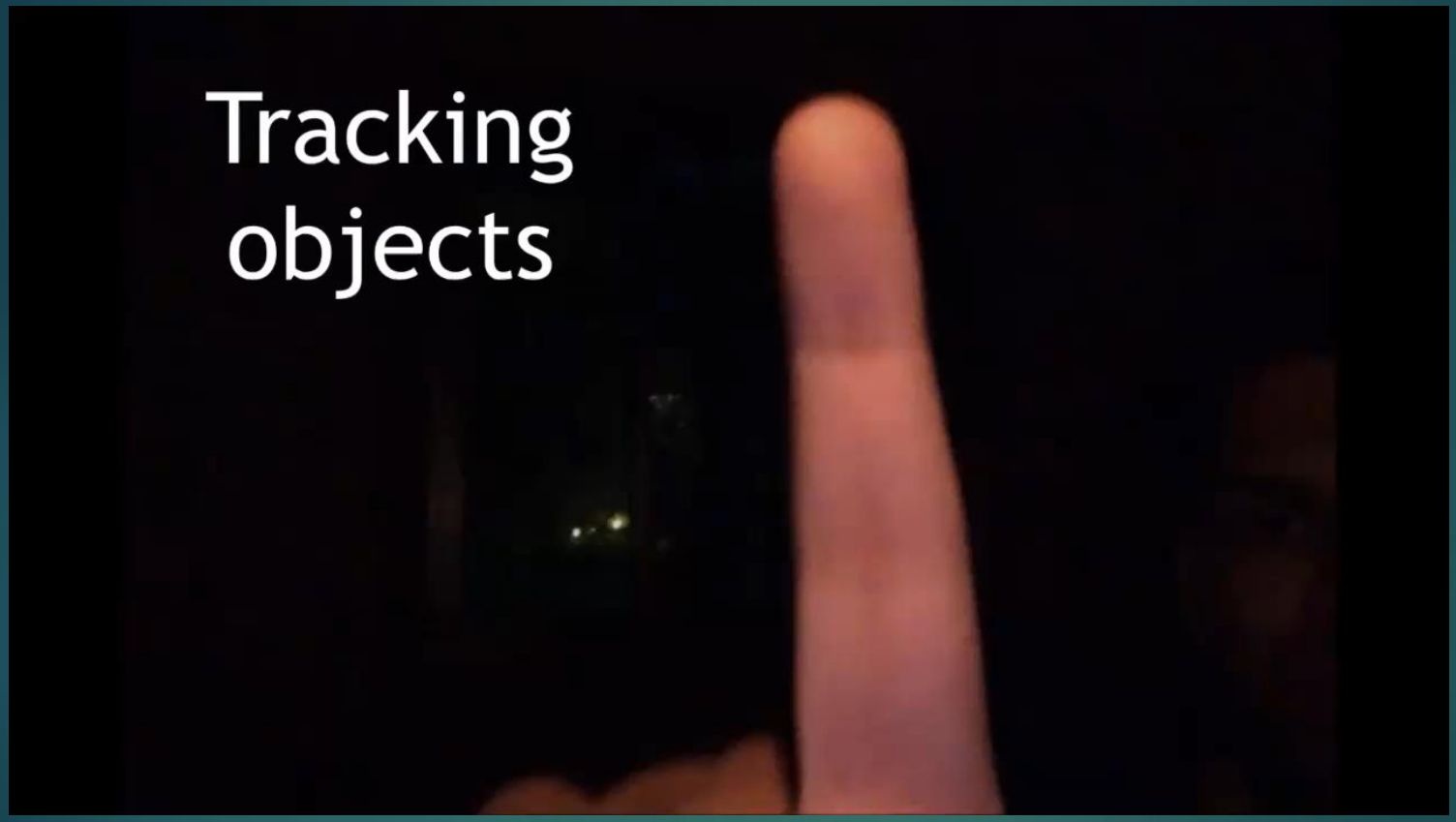

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Demo

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Acknowledgements

- Prof. Varsha Apte
- TAs – Ashish and Manasa
- Stack Overflow
- Google

Highlights

- OpenCV
- cv::calcOpticalFlowPyrLK
- cv::goodFeatureToTrack

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Algorithm Design

The question:

How to track moving objects?

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The solution:

- Convert feed to grayscale
- Decide which points to track by reading their RGB values and comparing their positions

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Assumptions

- Background - preferably dark
- Object to be tracked is brighter

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Class Design

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VideoProcessor

Main class which reads the video, displays the video, retrieves all the properties of the video like codec, frame rate, resolution etc.

FrameProcessor

An interface for all kinds of processing which has to be done frame wise. In the scope of this project, it is used for tracking feature points.

FeatureTracker

Derived from the FrameProcessor class. Converts the frames to grayscale, identifies feature points, decides which ones to track, tracks them and draws lines on the video to show where they have moved. Also gives the direction in which the points have moved – left or right.

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Data Structures

Purpose for which the data structure is used	Data Structure used	STL or own implementation
Video Codec	Union	STL
Tracked Features	Vector	STL
Initial positions of tracked points	Vector	STL
Positions of tracked points as they move	Vector	STL
Status of tracked features – success or not?	Vector	STL
If there was an error in tracking	Vector	STL

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Source Code

File Name	Description	Author
VideoProcessor.h	Declares VideoProcessor class and methods	Pratyush Nalam
VideoProcessor.cpp	Implements VideoProcessor class methods	
FeatureTracker.h	Declares FeatureTracker class and methods	
FeatureTracker.cpp	Implements FeatureTracker class methods	
Tracker.cpp	Main file which runs the program	

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Conclusion

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- Up and down tracking is not accurate, hence not shown. Tweaks required.
- Prelude to gesture recognition

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