Week Two

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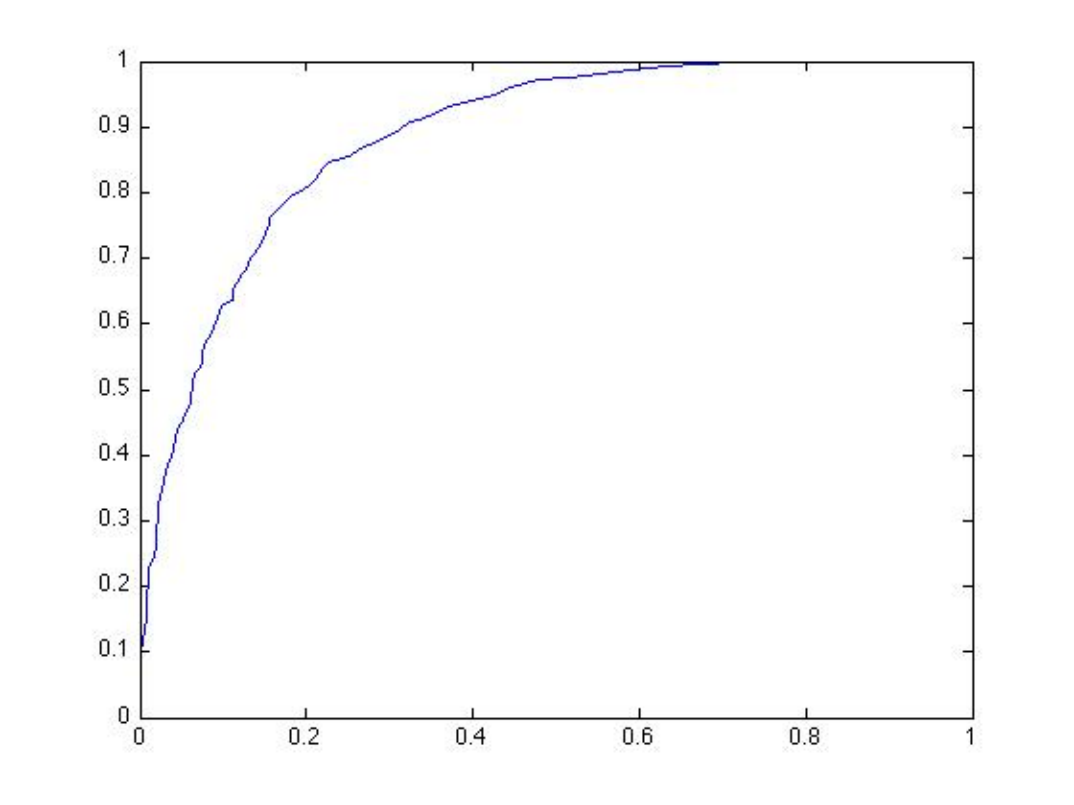
May 28, 2010

Overview

- Completed Learning Edge-Detector
- Implemented K-Means Segmentation
- Implemented Lucas-Kanade Optical Flow
- Background Subtraction via Medians and Gaussians

Learning Edge Detection

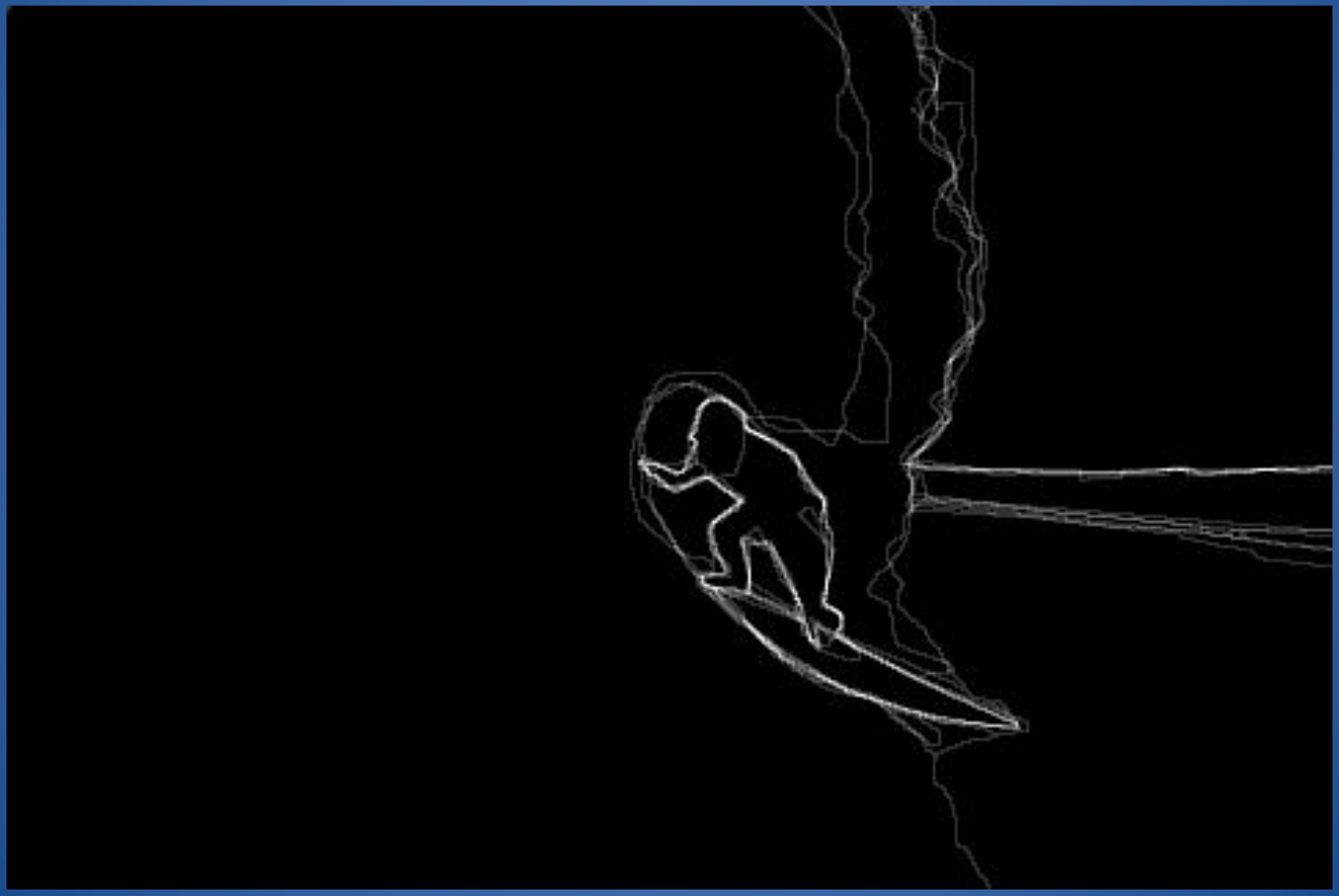
- Trained on 2000 sample images
- Found 8 features for each image sample (gaussian derivative convolution responses
- Tested on 2000 sample images
- ROC curve shown to the right



Original Image

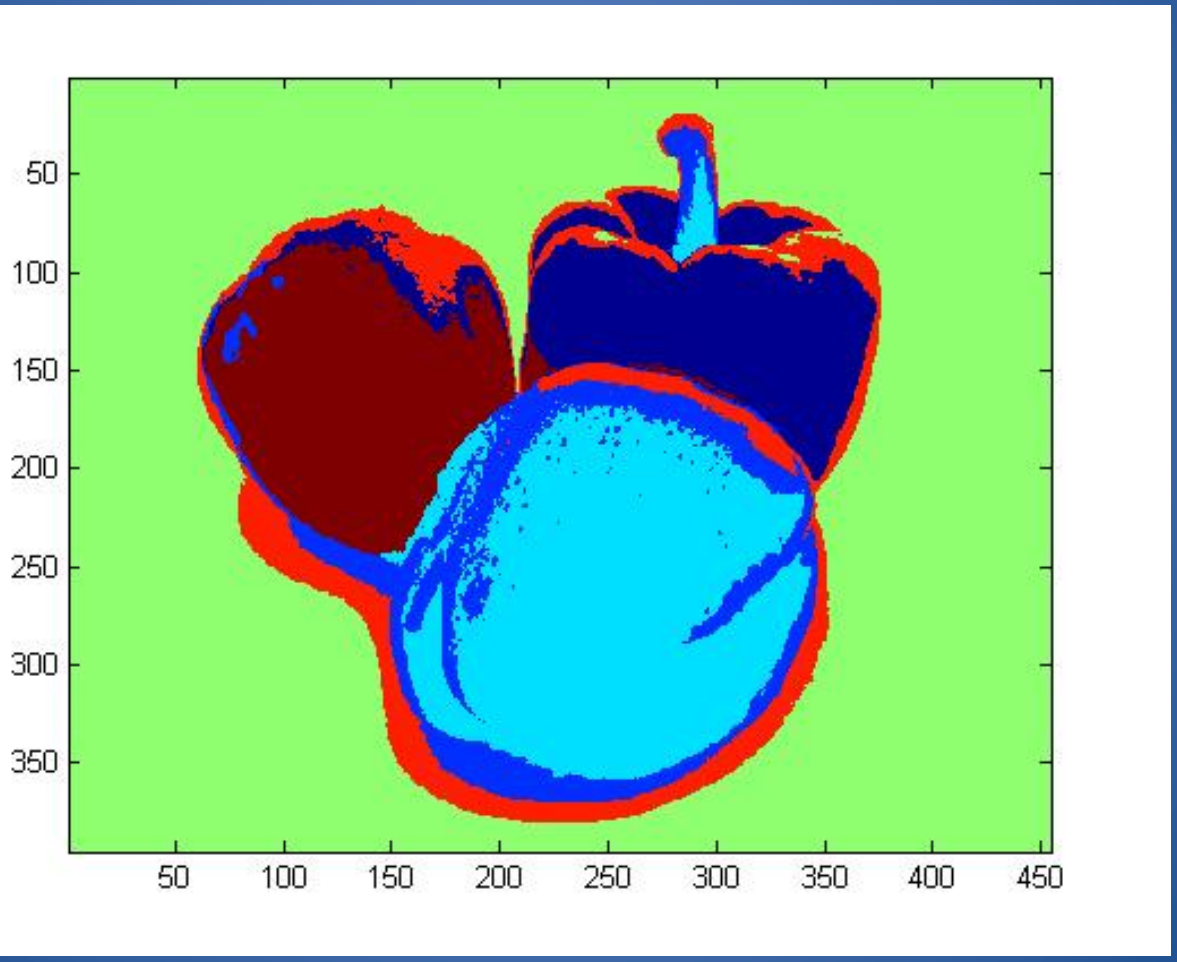
Edges Found

“Human” Edge Detection

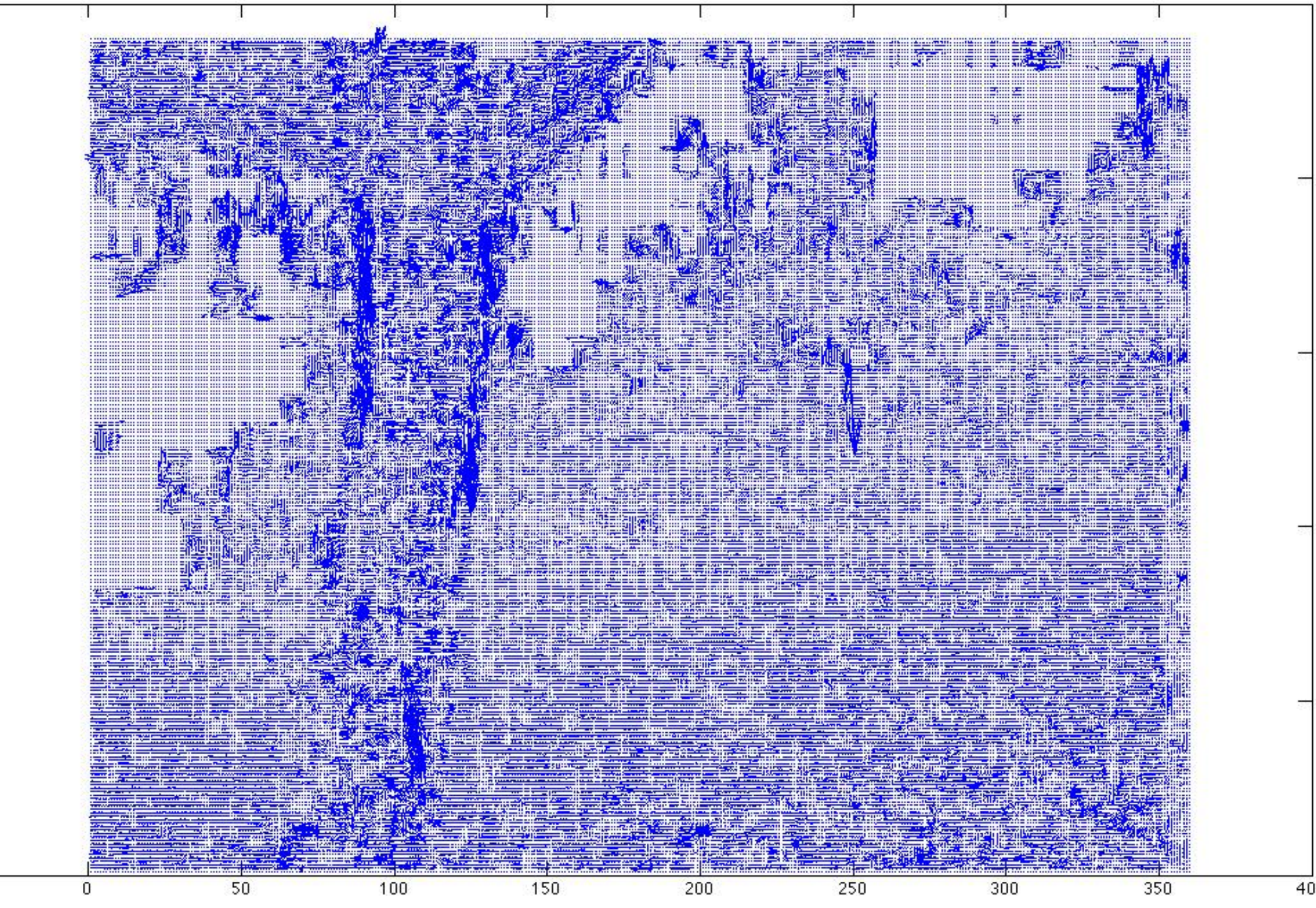


K-Means Segmentation

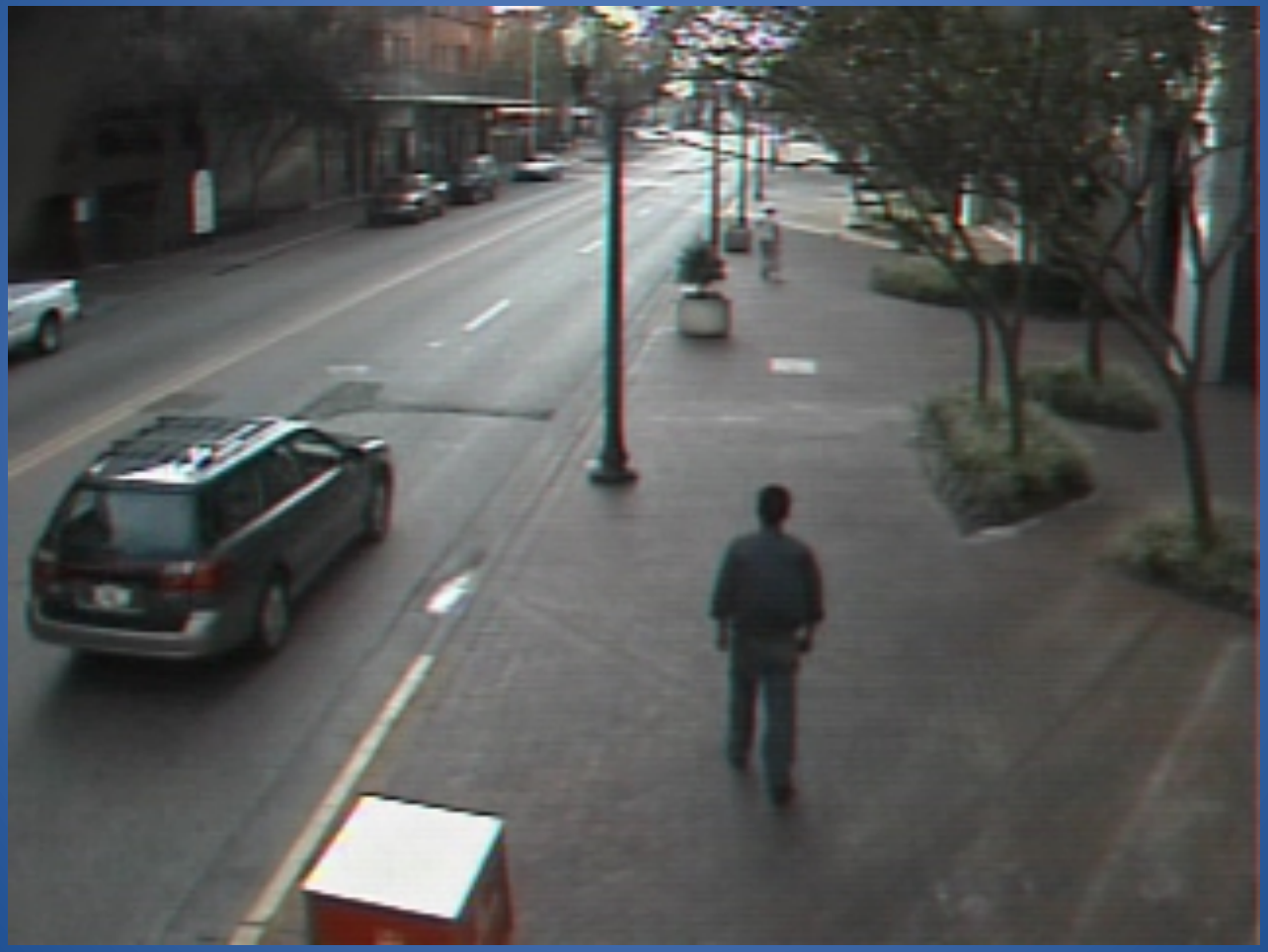
Segmented Image



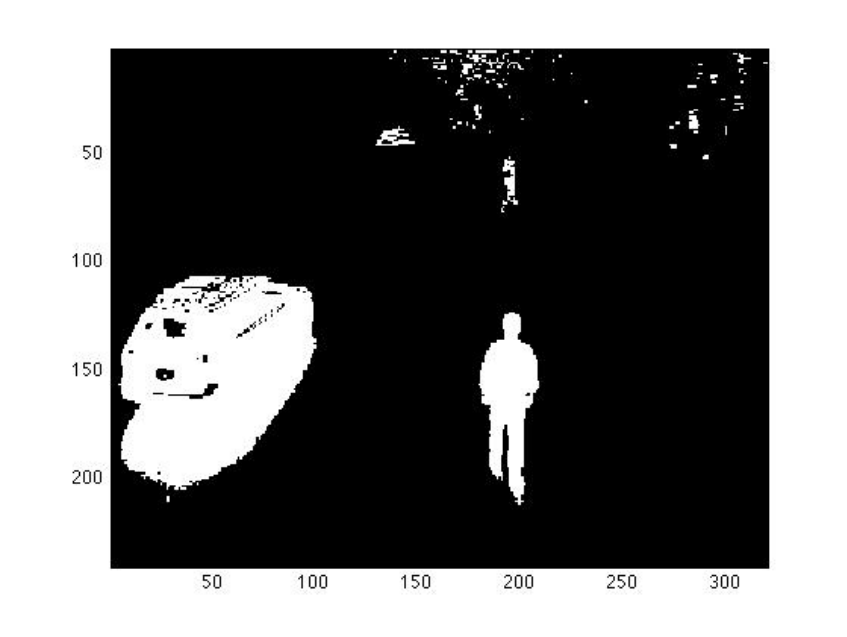
Lucas-Kanade Optical Flow


0
50
100
150
200
250
300
350
40

Background Subtraction



Medians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100
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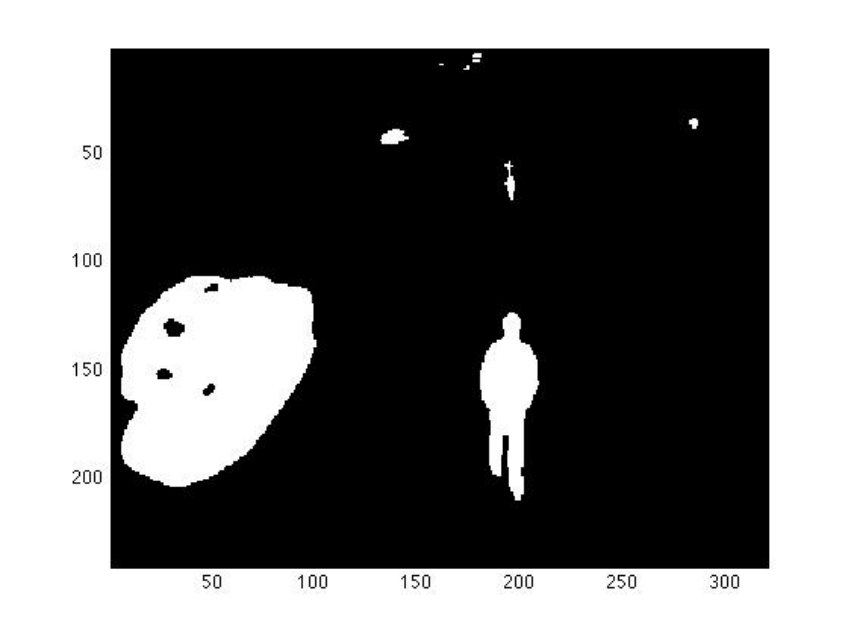
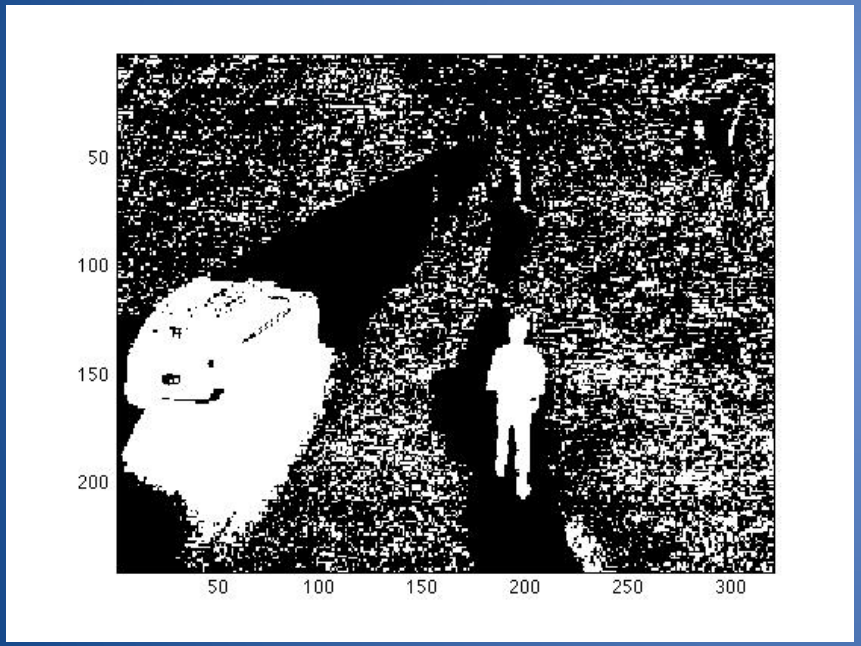
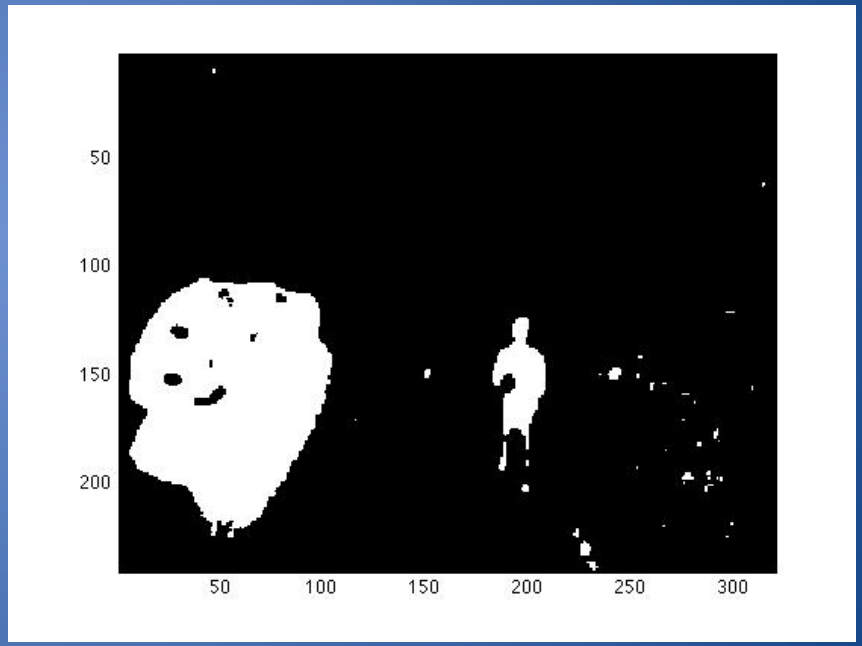

50
100
150
200
50
100
150
200
250
300

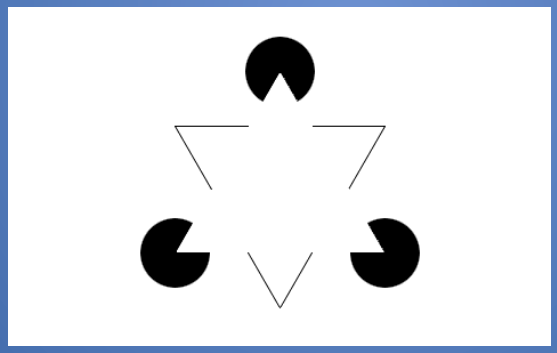
One Dimensional Gaussian





Research Areas

- Depth from De-focus
- Crowd flow and behaviors
- Detecting implied geometric shapes in images



- Dr. Lobo's Motion Detection Device
- Math Equation Solver through Character Recognition