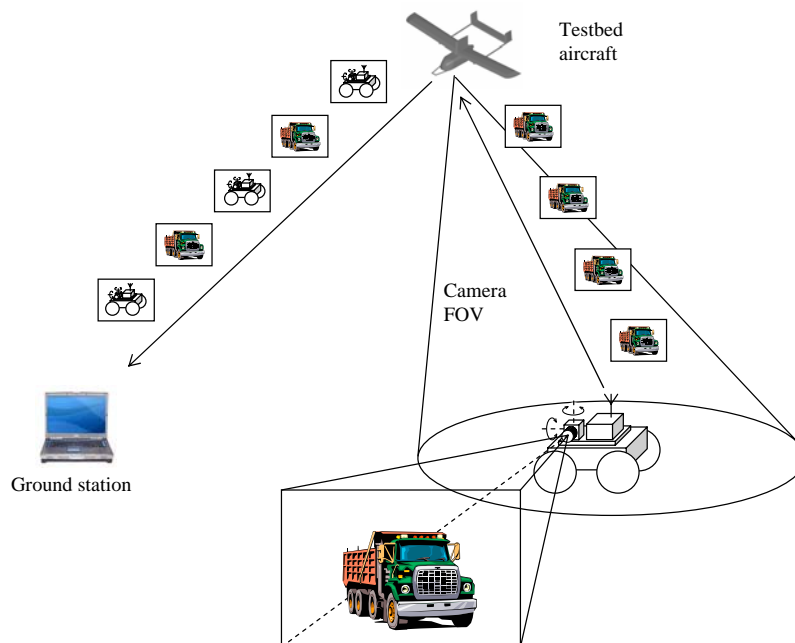


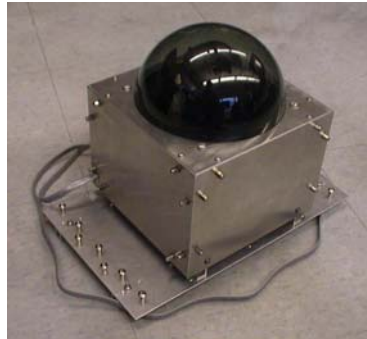
16.412  
Cognitive Robotics

Autonomous Visual Tracking  
Algorithms

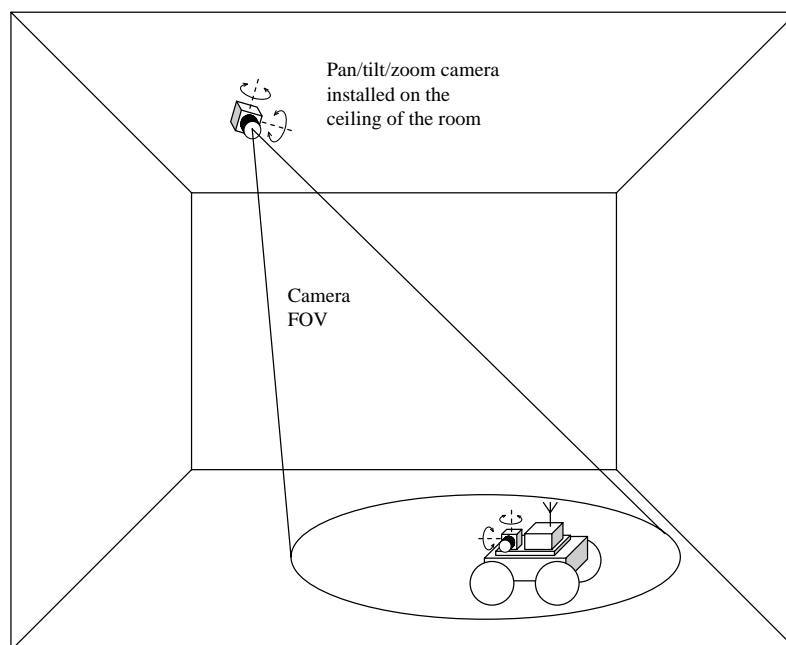
Alexander Omelchenko  
May 12, 2004

Problem Formulation

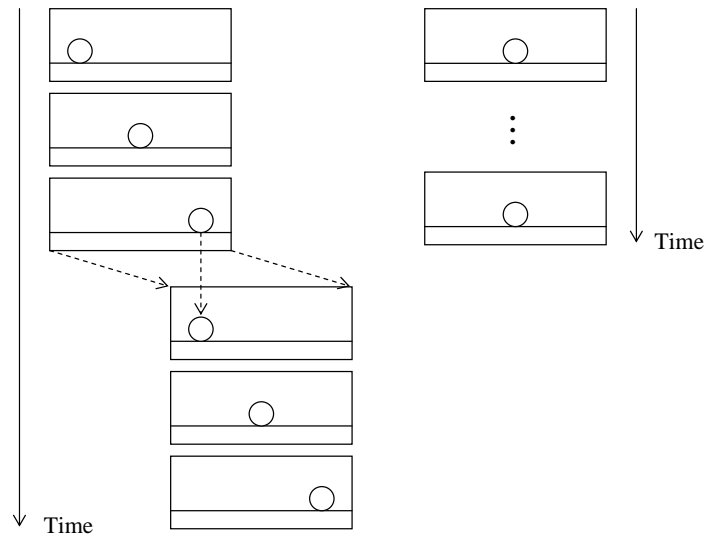




## Simplified Problem



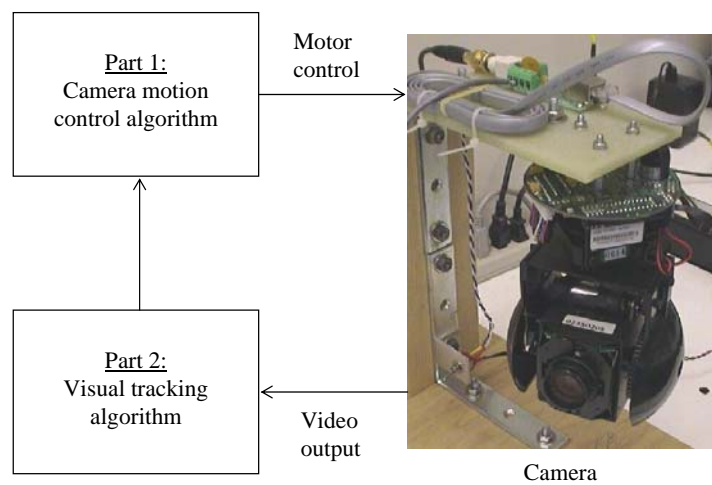
# Types of Visual Tracking



(a) Stepwise tracking

(b) Continuous tracking

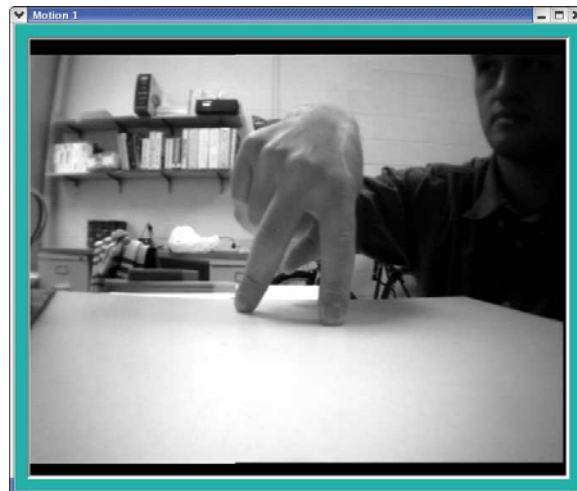
# Camera Pointing Control Approach



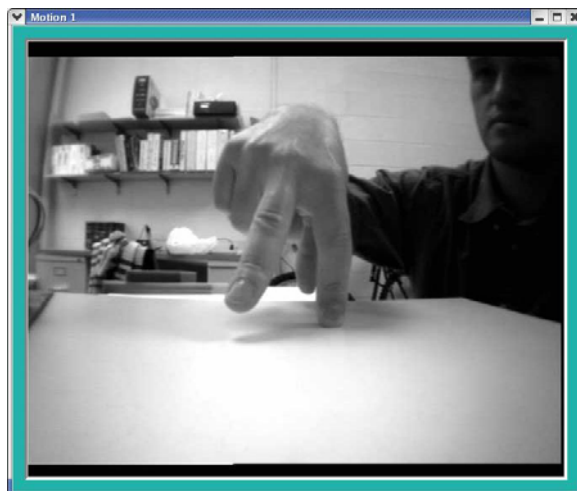
# Test Sequence of Images

- Sequence of images with any moving object is sufficient
- Object moving toward camera is a more challenging situation than object moving in a direction perpendicular to line of sight

# Test Sequence of Images



# Test Sequence of Images



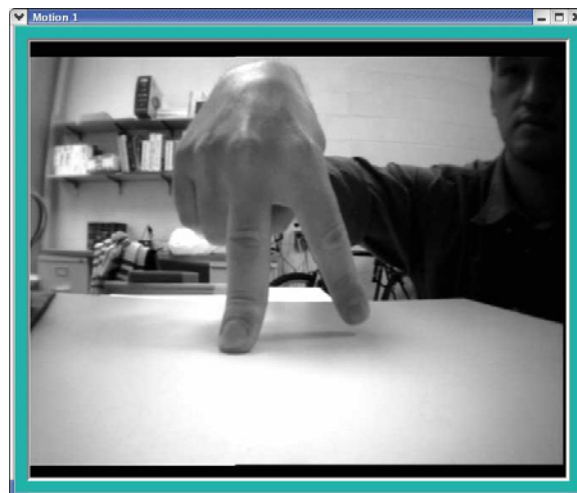
# Test Sequence of Images



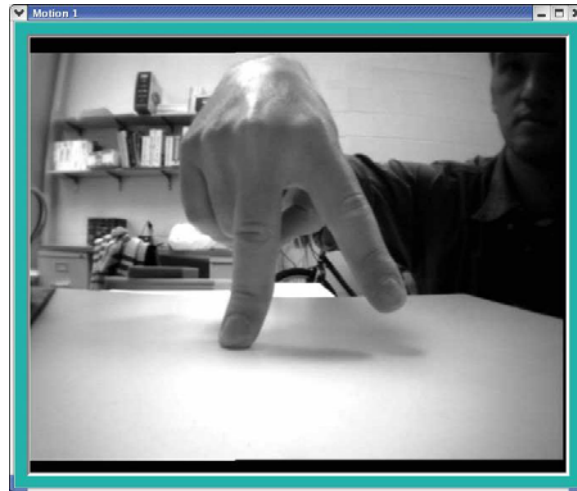
# Test Sequence of Images



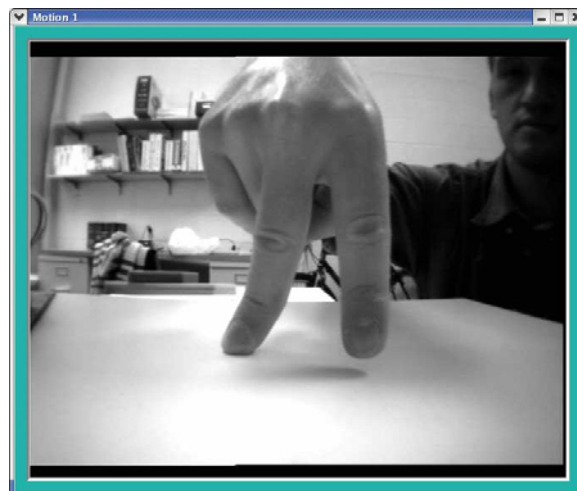
# Test Sequence of Images



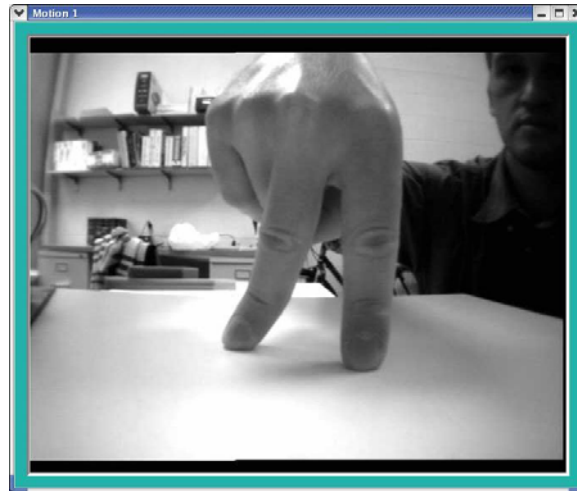
# Test Sequence of Images



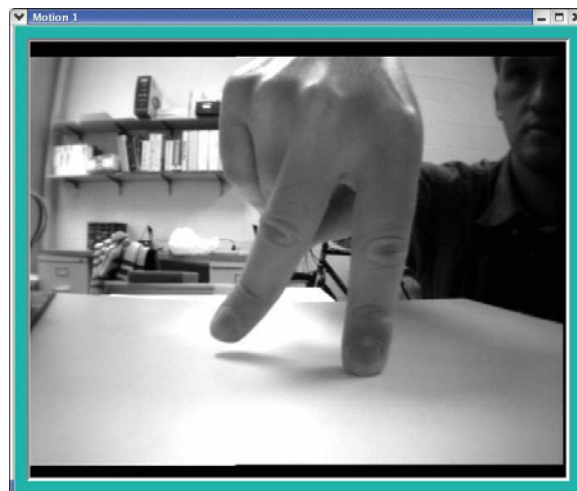
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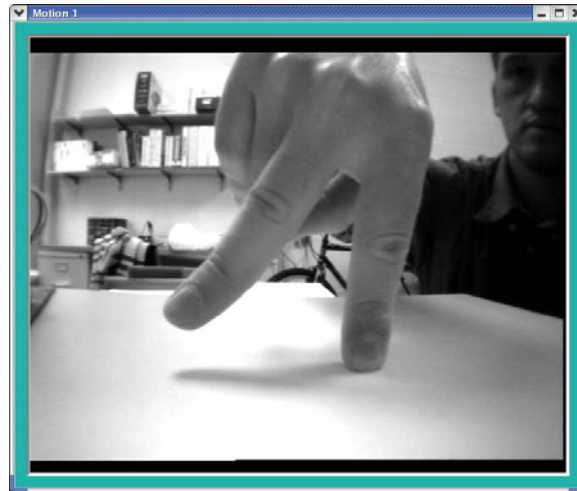
# Test Sequence of Images



# Test Sequence of Images



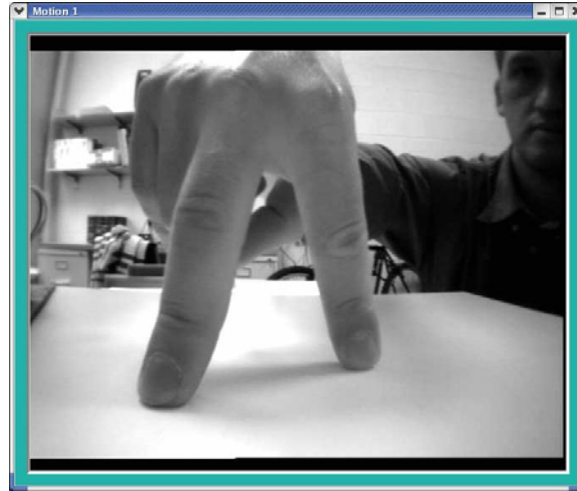
# Test Sequence of Images



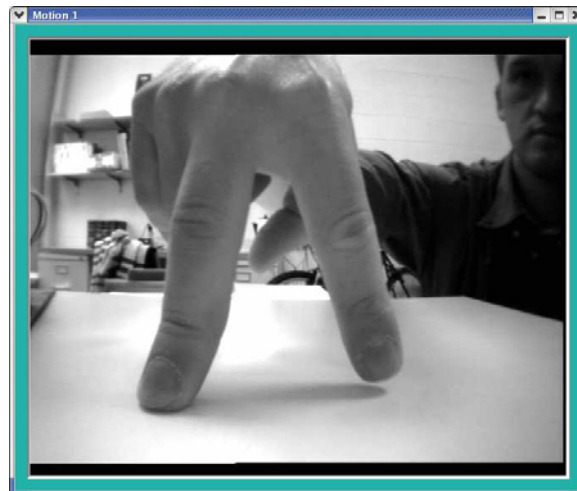
# Test Sequence of Images



# Test Sequence of Images



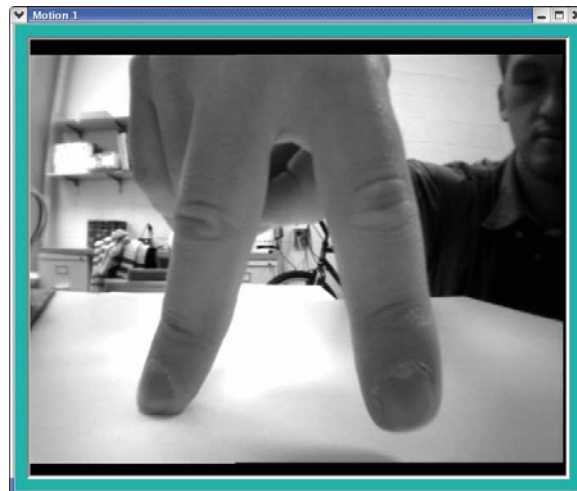
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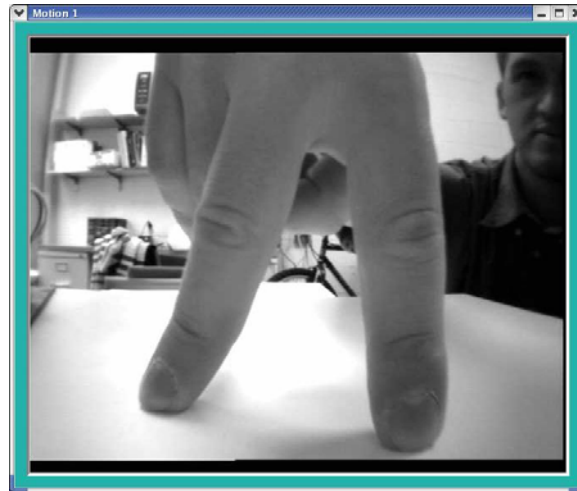
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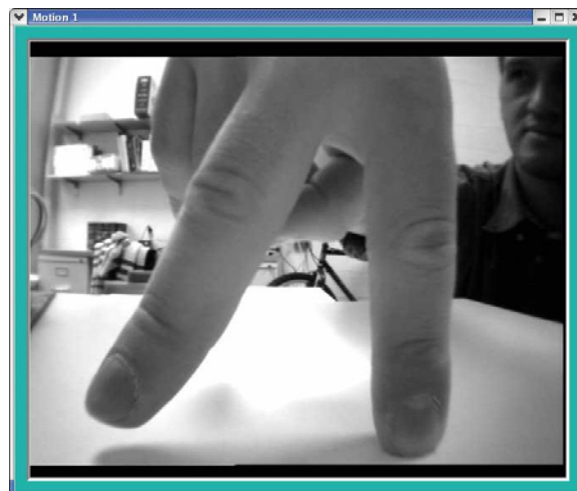
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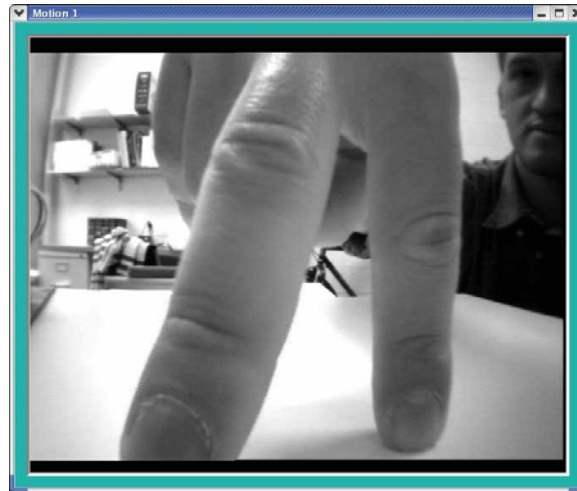
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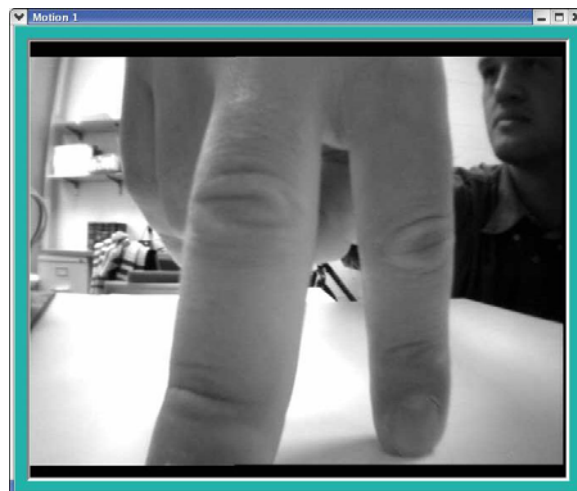
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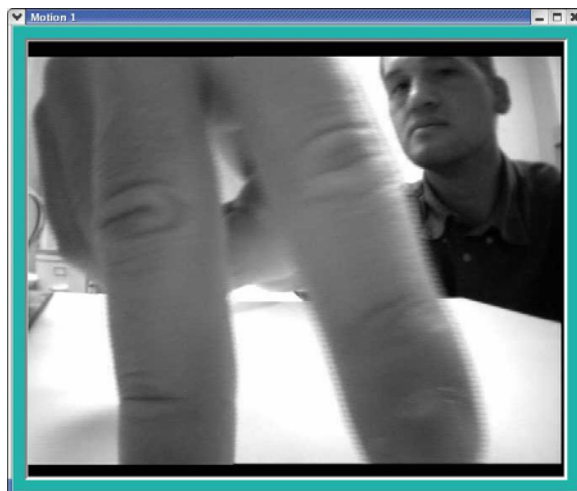
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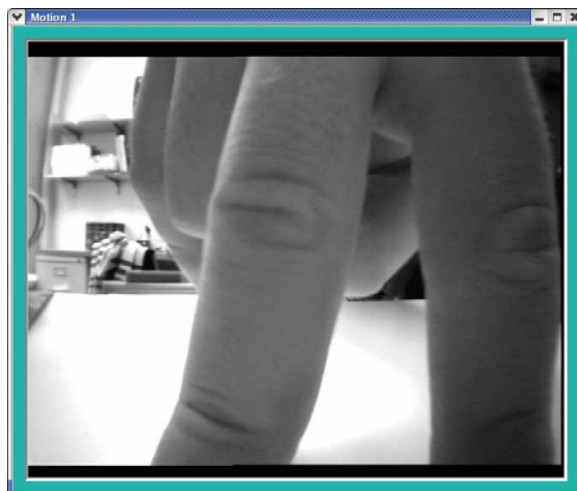
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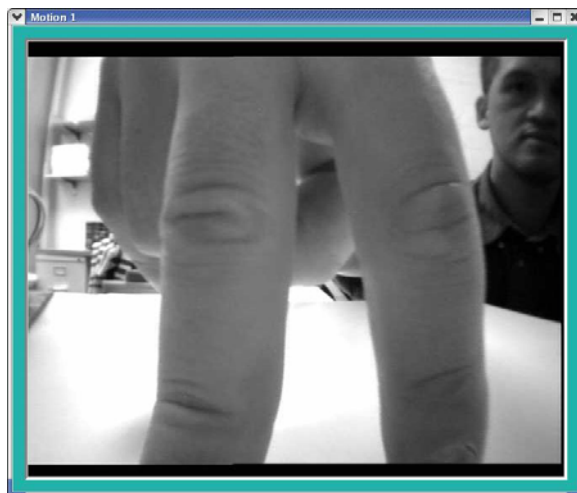
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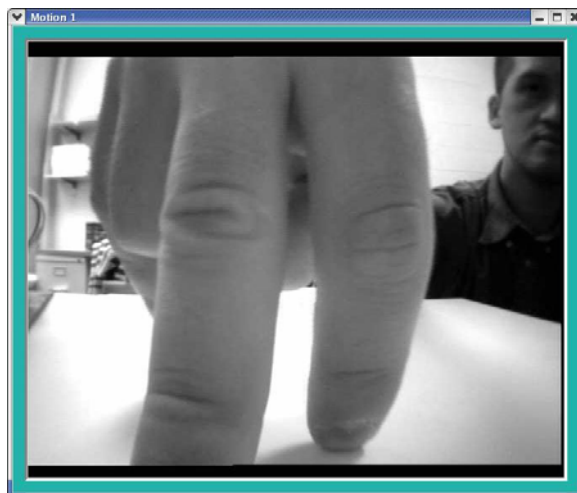
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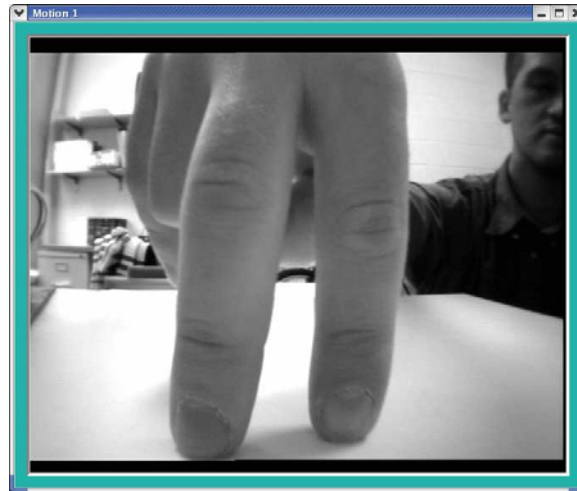
# Test Sequence of Images



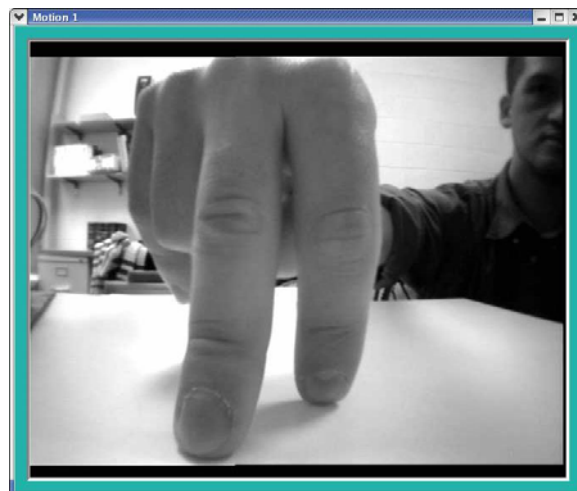
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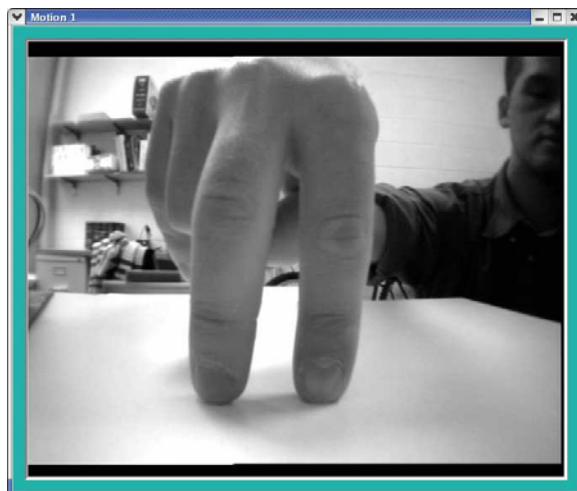
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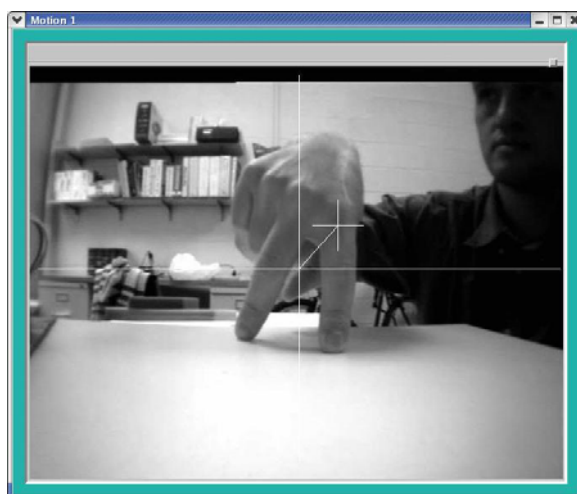
# Test Sequence of Images



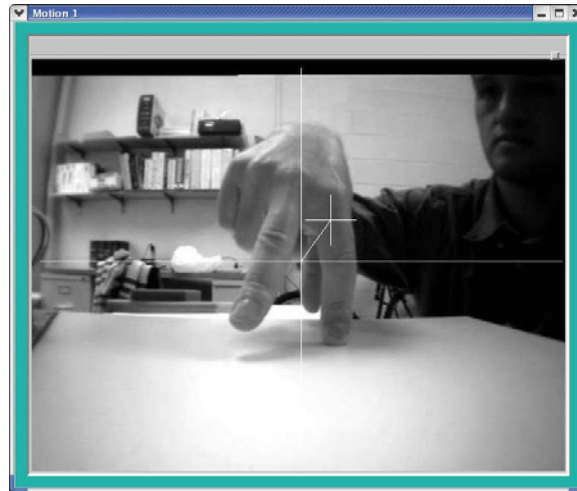
# Test Sequence of Images



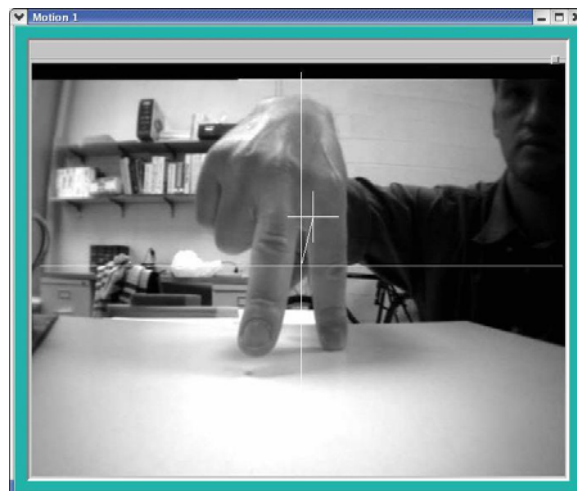
# Visual Tracking Results



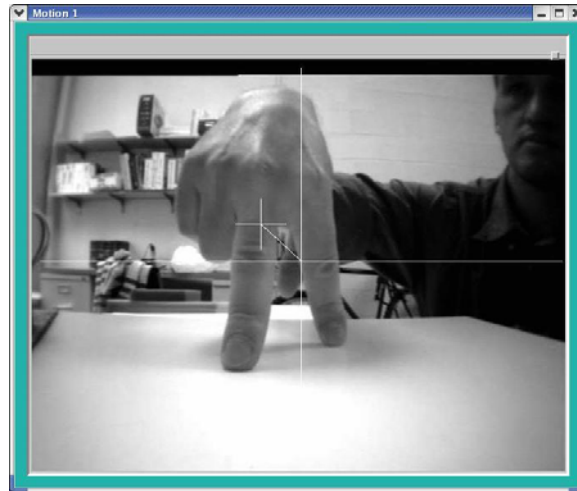
# Visual Tracking Results



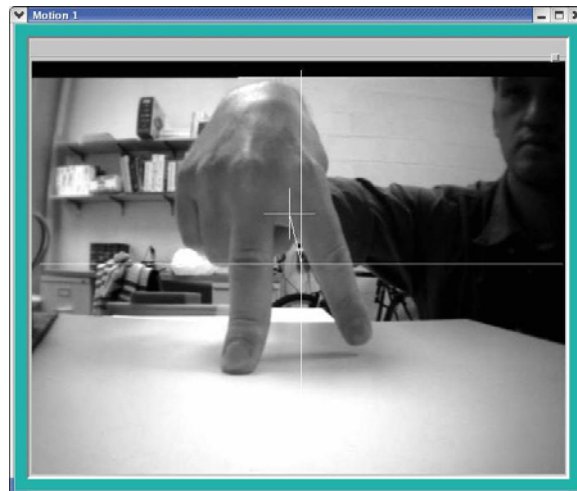
# Visual Tracking Results



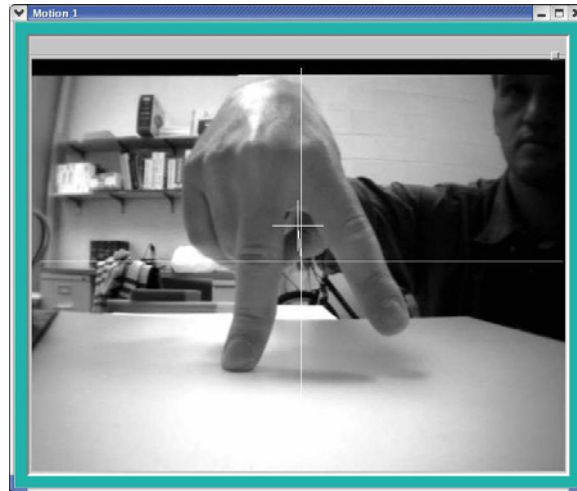
# Visual Tracking Results



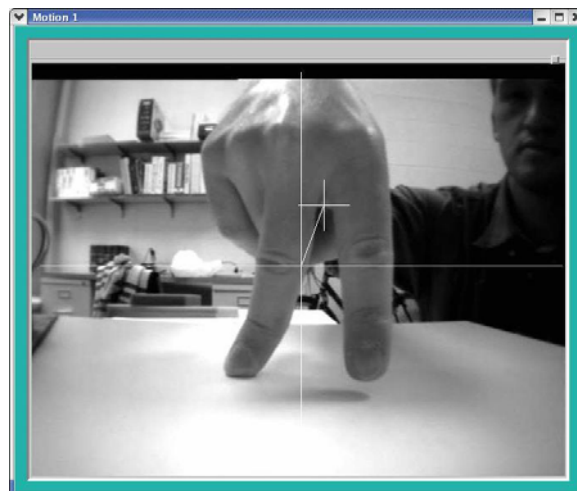
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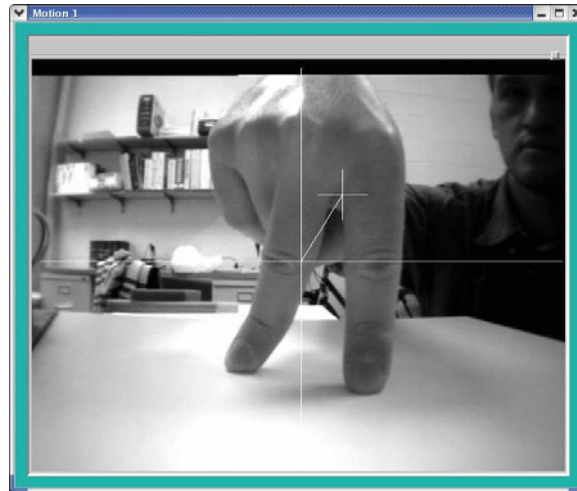
# Visual Tracking Results



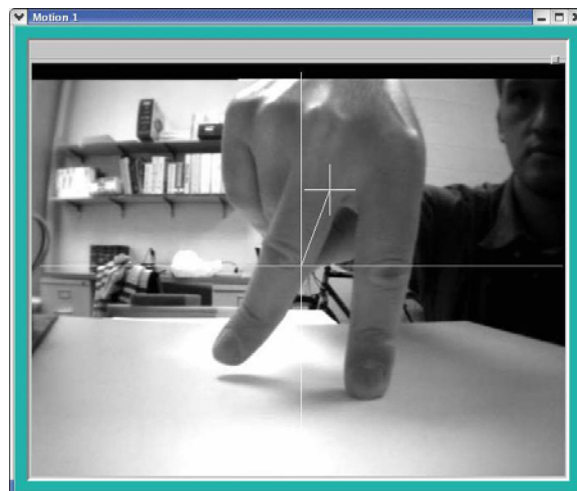
# Visual Tracking Results



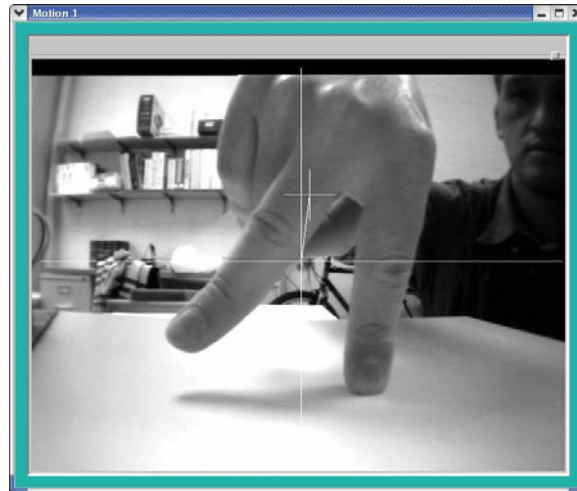
# Visual Tracking Results



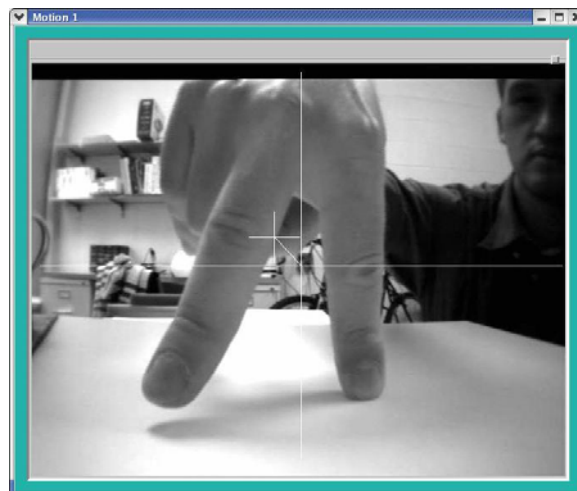
# Visual Tracking Results



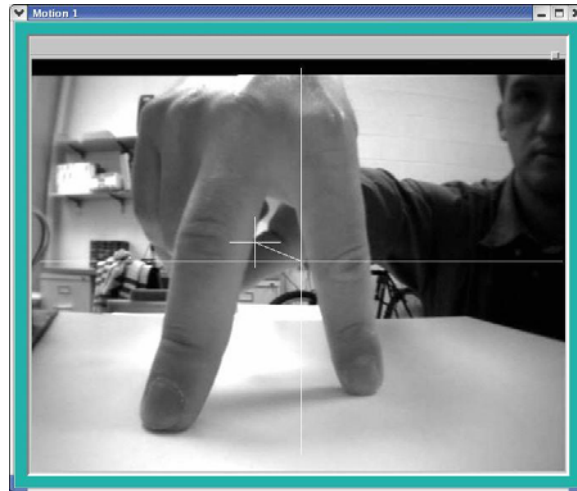
# Visual Tracking Results



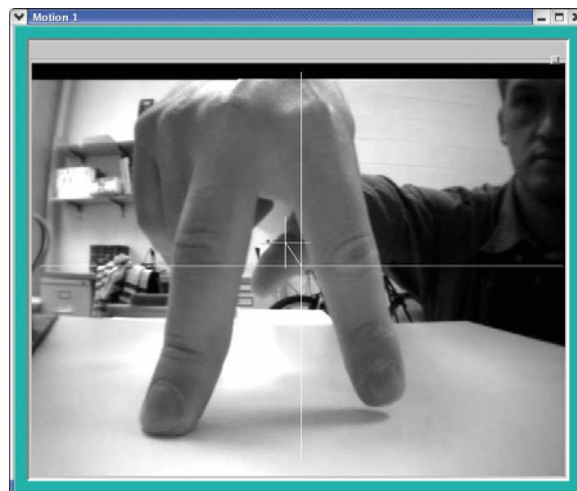
# Visual Tracking Results



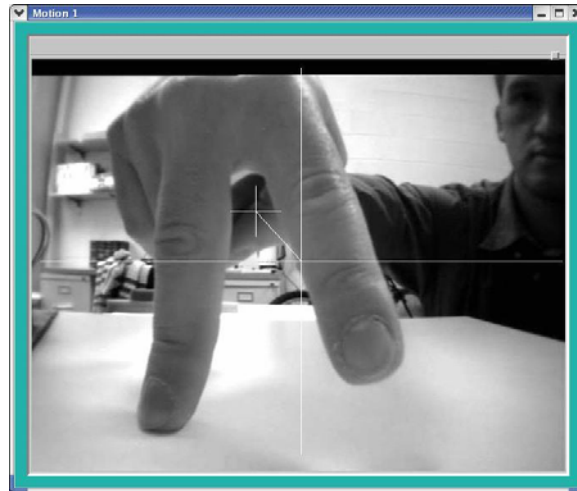
# Visual Tracking Results



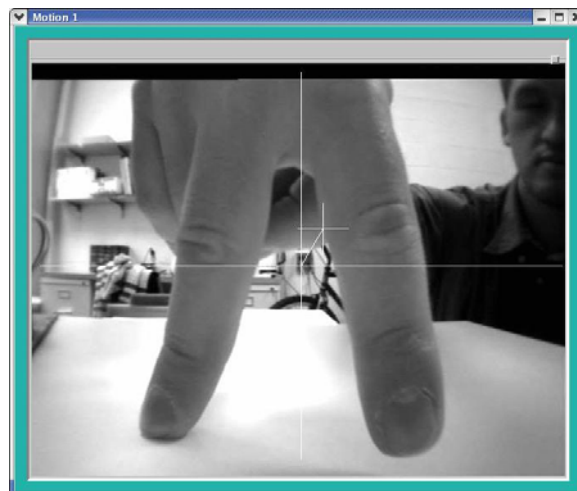
# Visual Tracking Results



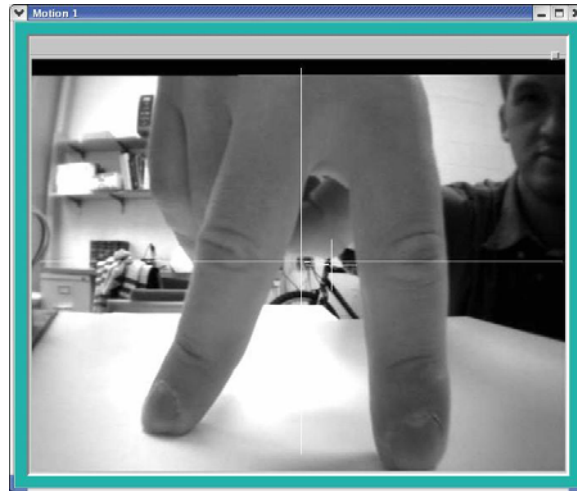
# Visual Tracking Results



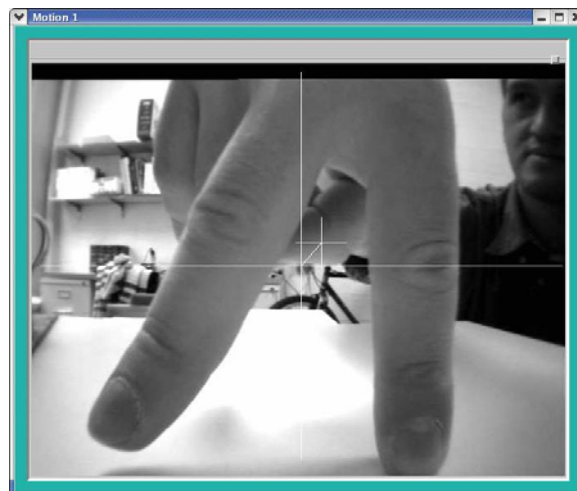
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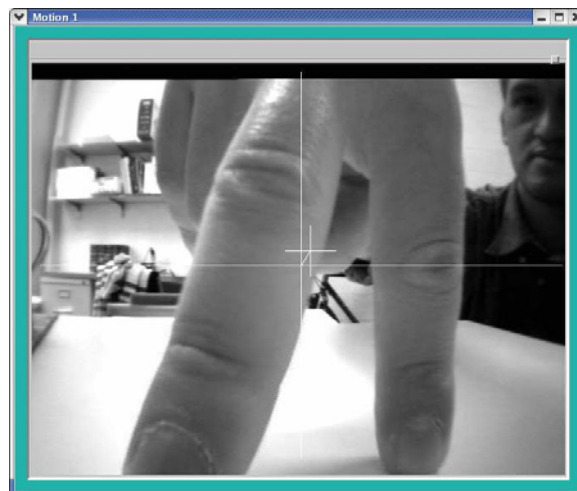
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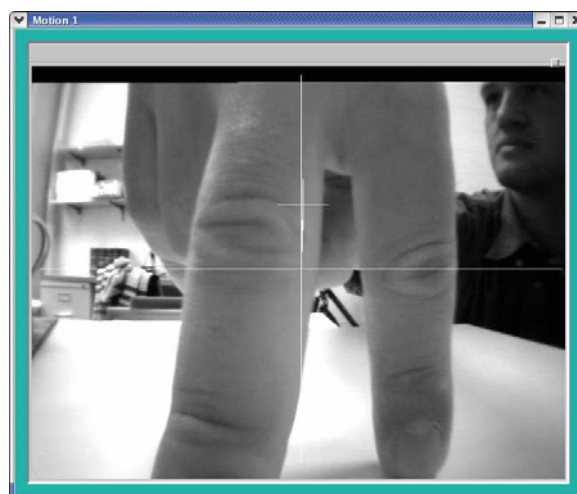
# Visual Tracking Results



# Visual Tracking Results



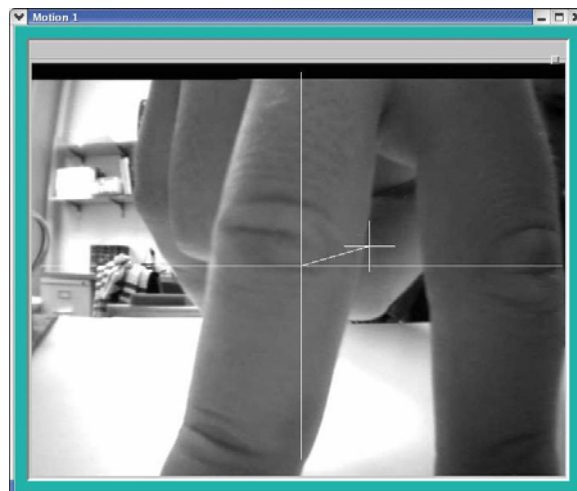
# Visual Tracking Results



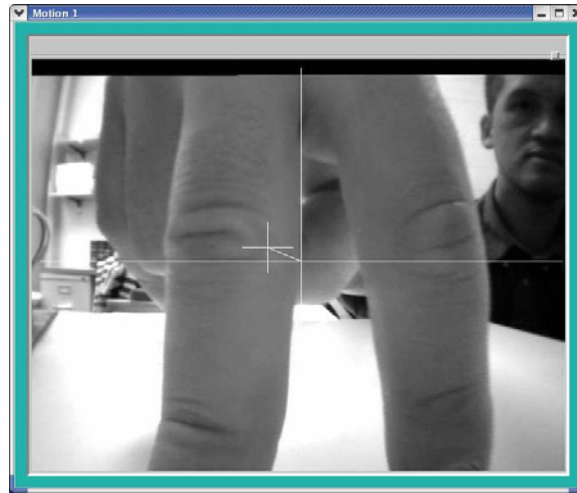
# Visual Tracking Results



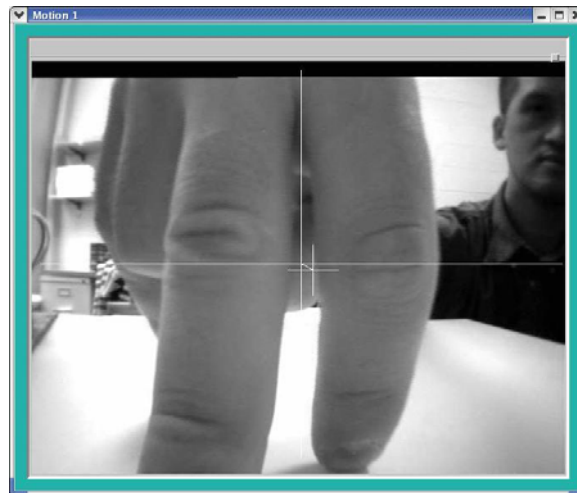
# Visual Tracking Results



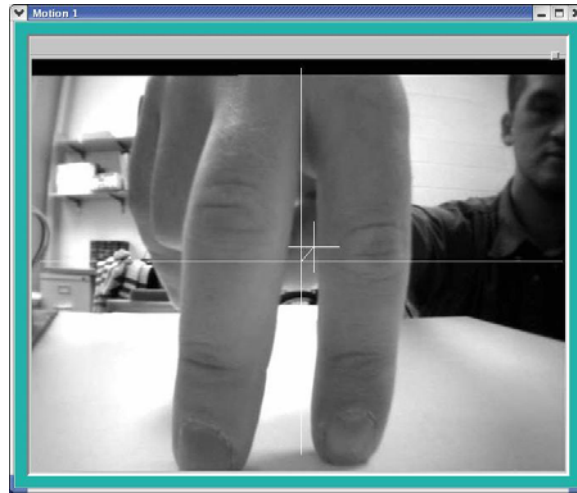
# Visual Tracking Results



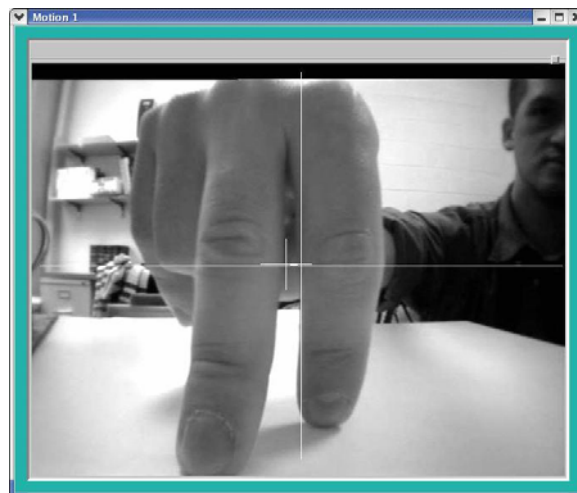
# Visual Tracking Results



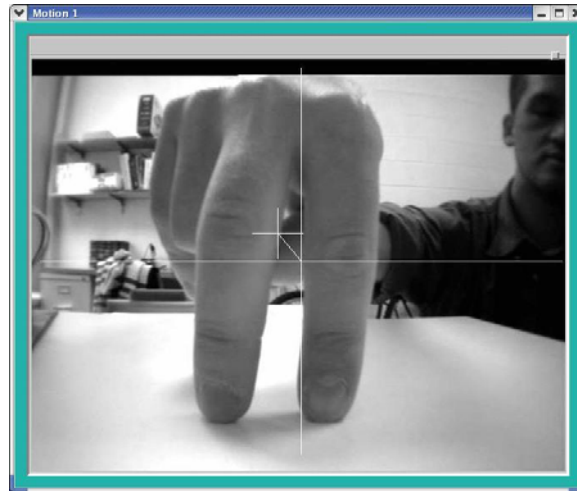
# Visual Tracking Results



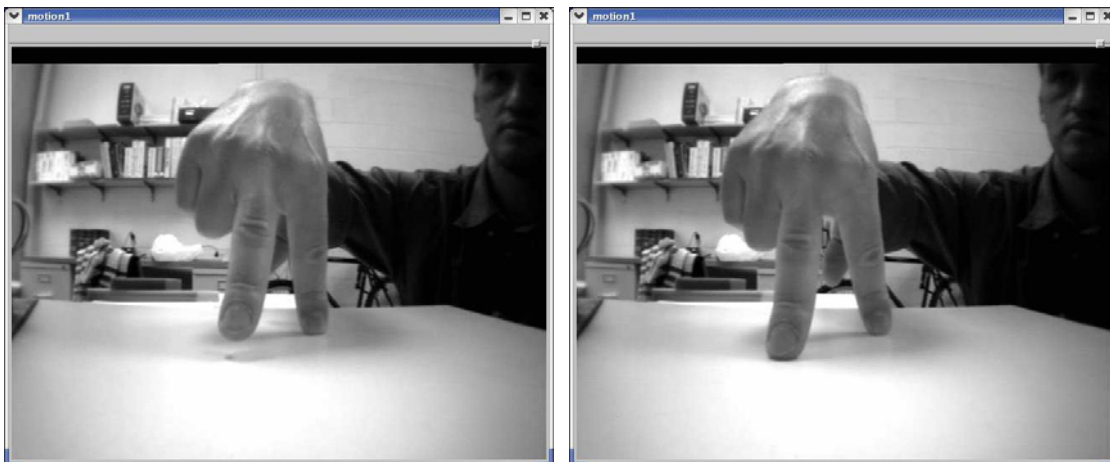
# Visual Tracking Results



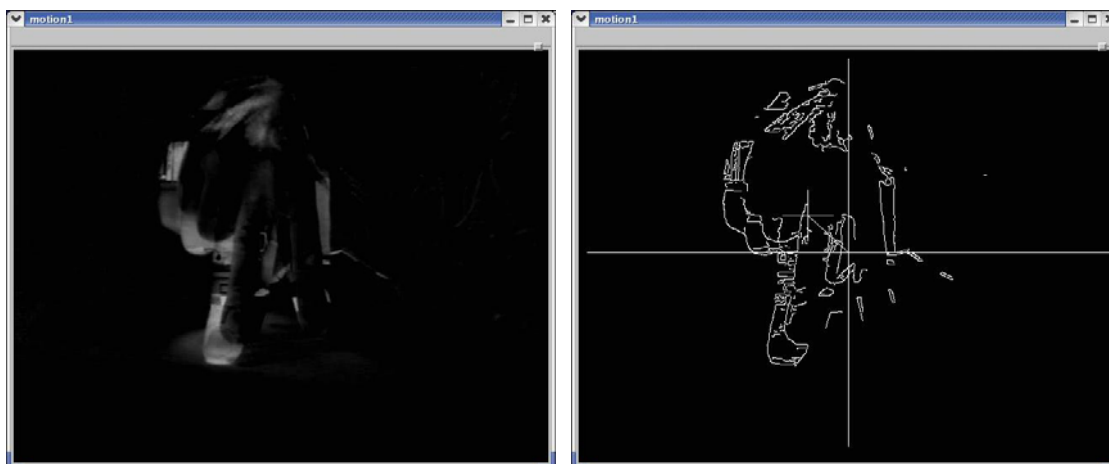
# Visual Tracking Results



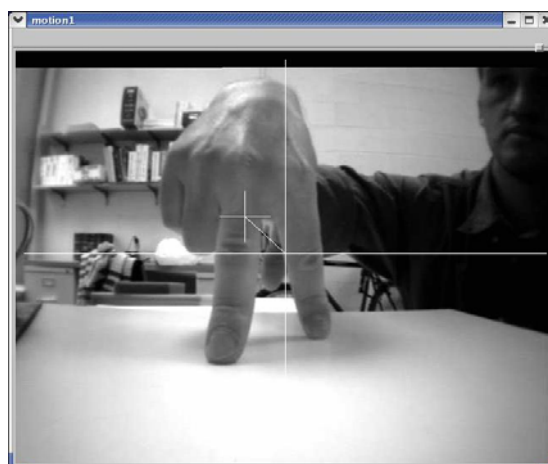
# Visual Tracking Algorithm



# Visual Tracking Algorithm



# Visual Tracking Algorithm



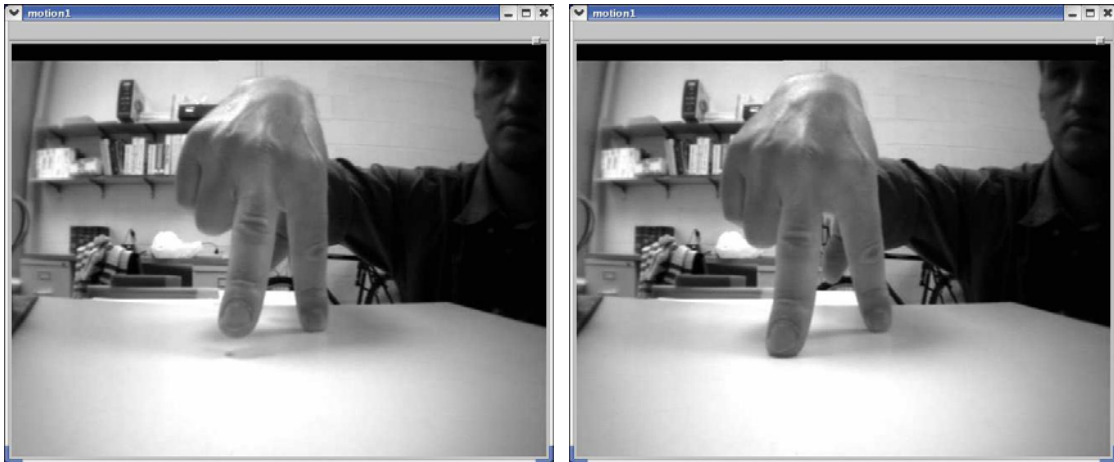
# Visual Tracking Algorithm

- Works with stationary background and single moving object
- Applicable to stepwise tracking
- Applicable to the simplified problem

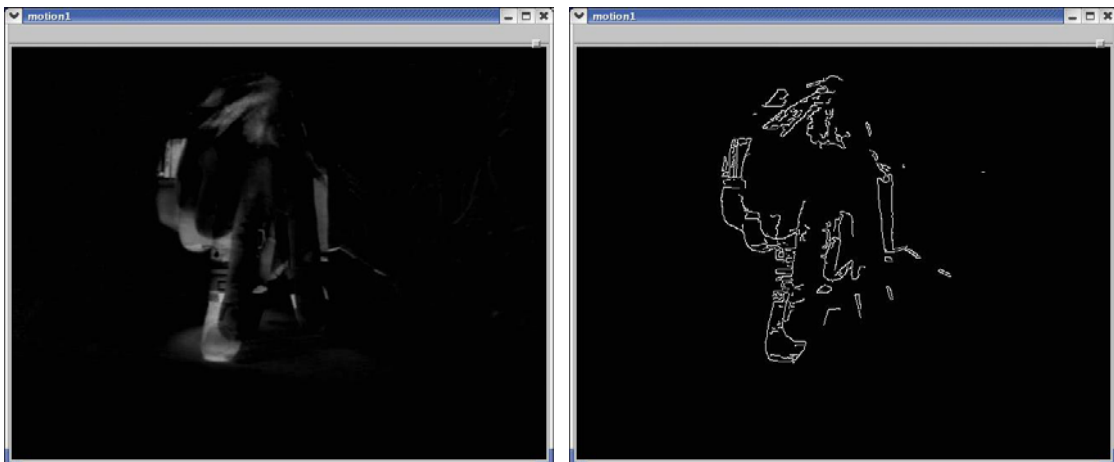
## Contour Tracking

M. Isard, A. Blake,  
*Condensation - conditional density  
propagation for visual tracking,*  
Int. J. Computer Vision, 1998

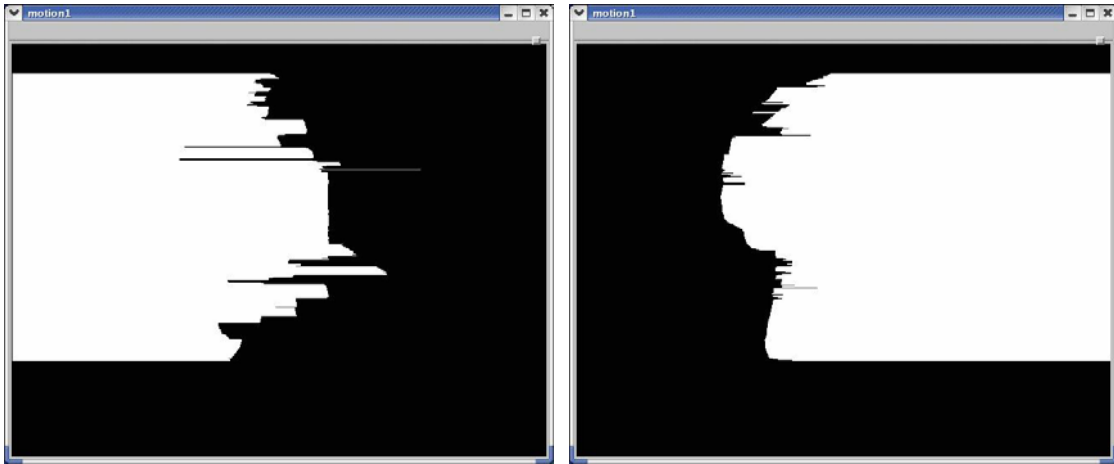
# Contour Tracking



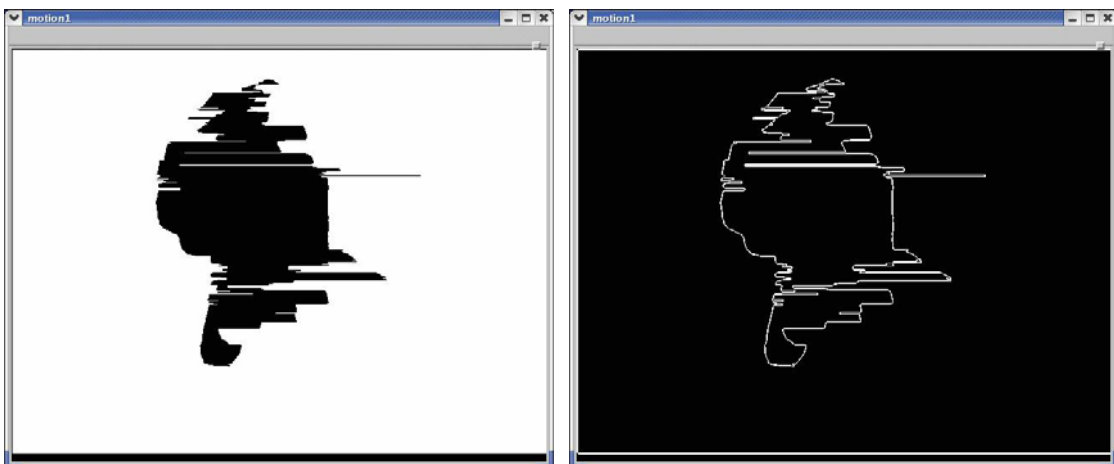
# Contour Tracking



# Contour Tracking

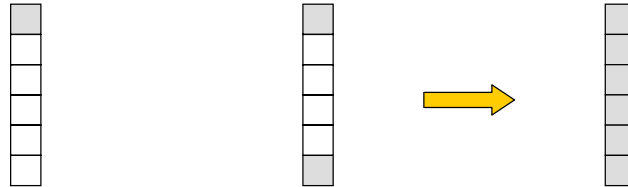


# Contour Tracking

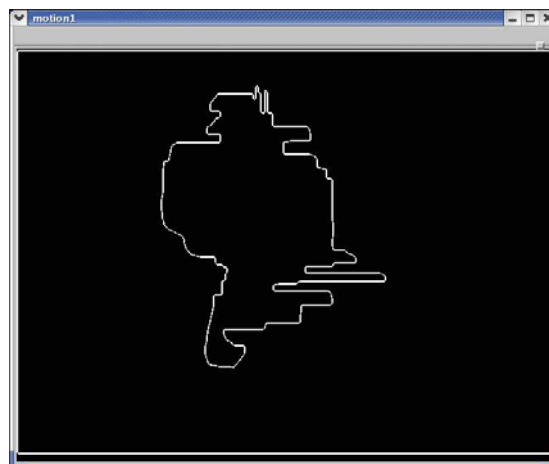


# Contour Tracking

Spike removal



# Contour Tracking



# Contour Tracking

