

Super Imposer v1.0

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Project Goal

- Create a mixed-reality stage using a Tablet PC and digital video camera
 - Non photorealistic rendering
 - Real-time performance

Similar Programs

- Playstation 2 Eye Toy



Challenges

- Image differencing
- Contour finding
- Image superimposition
- Non-photorealistic (NPR) Effects

Features

- Real-time subtraction of live subject
- Define animation paths
- Load/Save animation
- Non-photorealistic (NPR) effects on live subject

Previous Approaches

- Image subtraction
 - Chroma-key
 - Image differencing
 - Adaptive (background/foreground determination)
- Contour finding
 - Standard “walk” algorithm
- Edge detection
 - Sobel edge detector

Image Differencing – Step 1

- Obtain a reference image (background without subject)



Image Differencing – Step 2

- Get video/image stream with subject in it

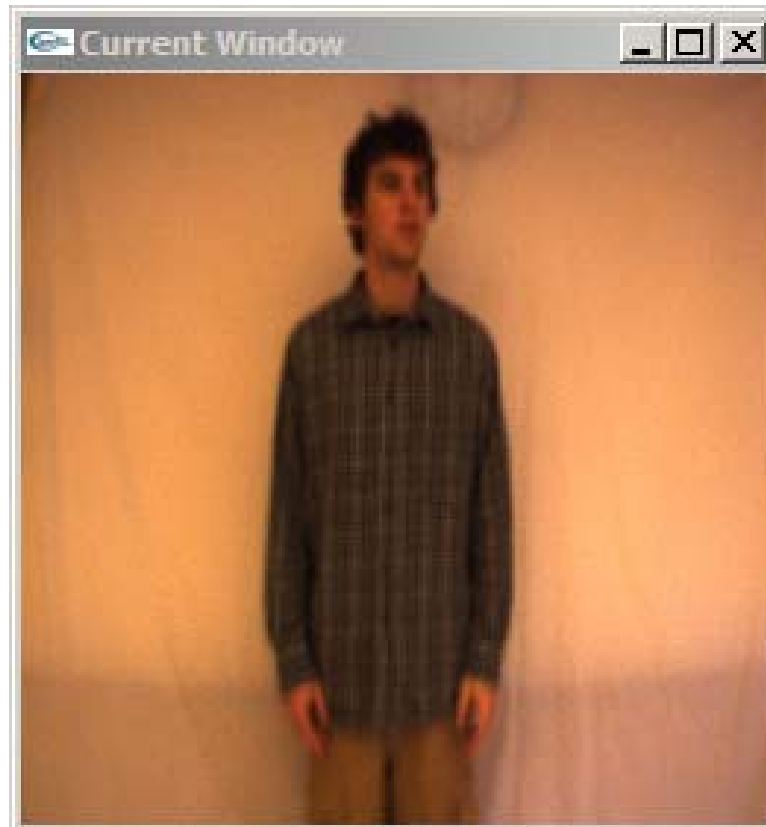


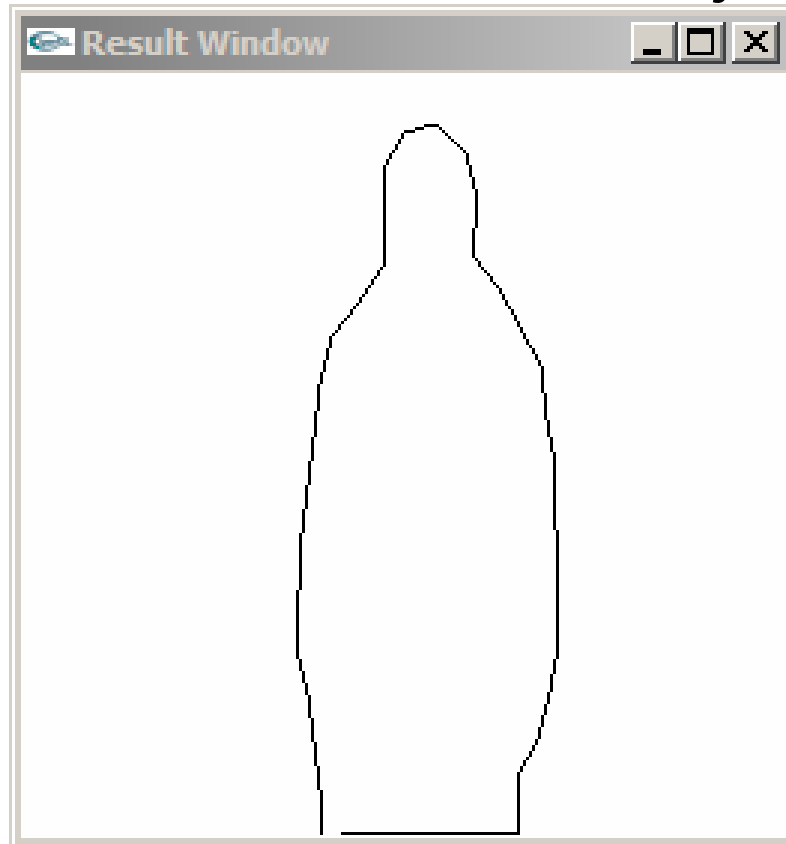
Image Differencing – Step 3

- Compare the luminance of each pixel in the reference image to current video frame and turn “off” similar pixels



Superimposition – Step 1

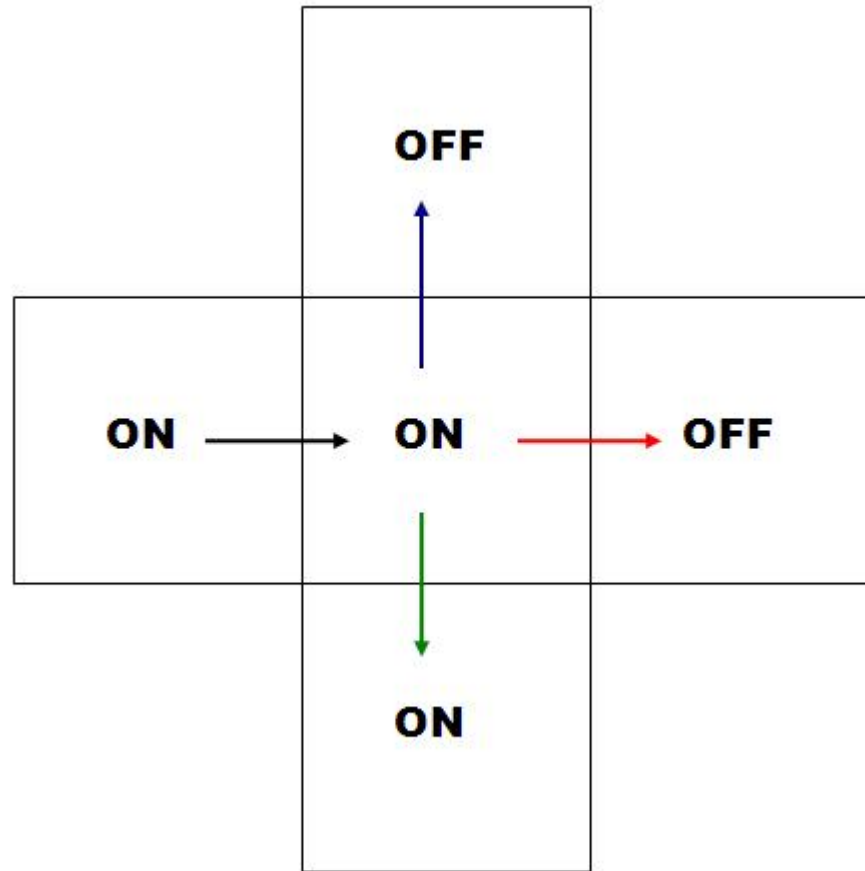
- Find the contour of the subject



Contour finding

- Scan image until first “on” pixel
- Look around “on” pixel for other “on” pixels
- Jump to the next “on” pixel found
- Repeat until last contour pixel equals the first contour pixel

Contour finding – Diagram



Superimposition – Step 2

- Fill in contour
- Texture geometry



NPR Effects

- Based on color values
- Editing RGB values for each texture gives different effects
- Sobel edge detector also used

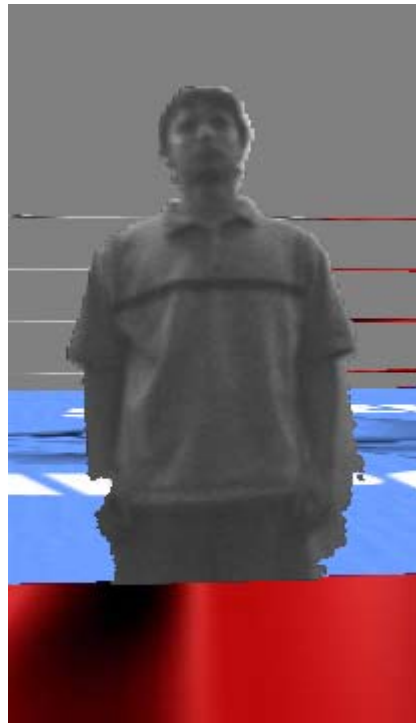
NPR Effects

- Simple histogram modification



NPR Effects

- Grainy black and white



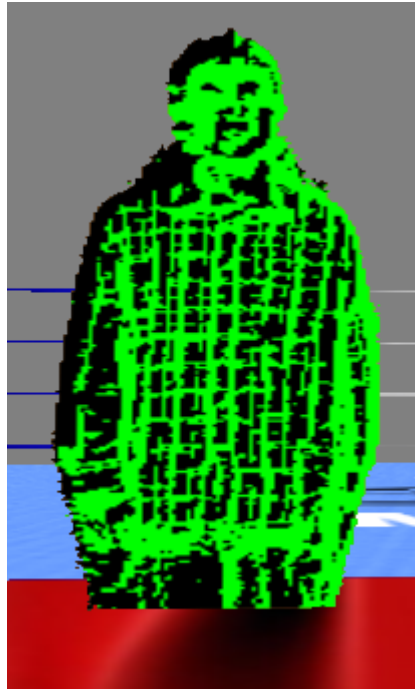
NPR Effects

- Sepia



NPR Effects

- Faux matrix



NPR Effects

- Cel-shade



NPR Effects

- Sketch



Animations

- Save an animation (video sequence)
- Play it back

Animation Paths

- Click on the screen and create a series of points
- These points represent “waypoints”
- The subject moves between each “waypoint”

That's a Wrap!

- Questions?