Spatial Media

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Thursdays
9:30am – 12:00pm
Room 447
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Spatial Media

Midterm Project

Work in groups of two.

Determine a specific context with specific content.

Design a horizontal interactive surface.

Make it work.
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FLOWCHART

1. DISPLAY DEVICE
2. COMPUTER (GRAPHICS)
3. COMPUTER (SENSING)
4. SURFACE SENSING DEVICE
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COMPUTER
(Graphics)

Surfacing

Sensing Device
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- Computer (Graphics)
- Display Device
- Surface Sensing Device
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1. COMPUTER (GRAPHICS)
2. DISPLAY DEVICE
3. SURFACE
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COMPUTER (GRAPHICS)

DISPLAY DEVICE

SURFACE

SENSING DEVICE
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- COMPUTER (GRAPHICS)
  - DISPLAY DEVICE
    - SURFACE
      - SENSING DEVICE
        - COMPUTER (SENSING)
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- Design on paper first (big paper!)
- Design wireframes second
- Design storyboards third
- Implement with OpenFrameworks

http://www.openframeworks.cc/documentation
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- Find a projector
- Determine optical specifications
- Make dimensioned drawings (CAD)
- Design the mounting system
- Construct the mounting system
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Choose a surface material
Test surface with projection
Determine surface size
Make dimensioned drawings (CAD)
Construct surface and structure
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- Find a camera
- Find an IR filter and IR light
- Determine optical specifications
- Make dimensioned drawings (CAD)
- Construct camera mounting
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Connect camera to computer
Test actual camera input
Determine best sensing algorithm
Implement sensing algorithm
Test sensing algorithm
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Connect sensing output to graphics input

Develop camera / projector calibration algorithm

Implement calibration algorithm

Test the system
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Midterm Project Schedule

Sunday March 6 (1pm)
Form team, Divide the work, Develop Concept, Design storyboards, Find equipment, Create dimensioned drawings

Thursday March 10
Develop fully working (mouse-based) interactive software, Begin work on sensing system, Begin construction

Thursday March 24
Complete sensing system, Complete Construction, Connect sensing system to interactive software, Develop calibration system, Test everything, Present to class

Friday, March 25
Sleep
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Machine vision
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Machine vision requires multiple stages:

1. Image Processing (low level)
   - background subtraction | edge detection | motion detection

2. Object Identification (mid level)
   - bounding box, seed fill, contour tracing, etc.

3. Feature Analysis / Recognition (high level)
Object Identification, part 2

Create N objects, where N = the number of labels

Add all objects to a list (an array or vector)

Scan through image, adding pixel coordinates to the associated object

Calculate object properties based upon pixel composition
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Object Identification, part 2

for each label
make a new Object with ID = label
add the Object to objectList
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Object Identification, part 2

for every pixel in labelledImage
add pixel coordinates to the Object with same label
compute Object properties based on coordinates
add computed properties to Object