

Multimodal Imaging, Modeling and Presentation

CSC 59866, Spring 2007

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Course Organization

- Spring 2007: Capstone I
 - Lectures, labs and readings
 - Project topics and specifications
- Fall 2007: Capstone II
 - Project design
 - Project implementation
 - Project evaluation

Course Contents

- Imaging
- Modeling
- Presentations with
- Multiple Modalities
 - Color (video)
 - Thermal (video)
 - Acoustic (audio)
 - 3D structure
 - ...
- Image Input; Sensors
- Processing; Computing
- Image Output; Display
- Multiple Sensors
 - Color cameras
 - Thermal cameras
 - Laser Doppler vibrator
 - Stereo head
 - ...

Capstone I Outline

- Fundamentals of Image Processing
 - Image Formation & Multimodal Sensing
 - Image Enhancement & Processing
 - Morphological and Color Image Processing
 - Image Segmentation and Object Extraction
- Selected Topics and Labs
 - Image processing GUI with QT
 - Multimodal sensors & digital interfaces
 - Image processing in Matlab with C++
 - Camera /Image access with web interface

Capstone II Project Ideas

- ❑ Multimodal sensing for human exercise (e.g., on treadmill) analysis and integrated displays with QT
- ❑ Web interface for video surveillance with a webcam
- ❑ Matlab interface for image mosaicing with a PTZ camera control and USB capture via C++
- ❑ Image colorization, enhancement and display using Matlab & C++

Textbook and References

- ❑ **Textbook** (not required)
 - "Digital Image Processing", 2nd Edition, by Gonzalez and Woods , Prentice Hall @ 2002
- ❑ **References**
 - [Image processing - Wikipedia](#)
 - [MATLAB image processing - Wikipedia](#)
 - Matlab image processing toolbox
 - QT image classes at <http://trolltech.com/>