MAT 594CP Experimental Projects in Optical-Computational Processes

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E-studio, rm 2220 Department of Art
Tues-Thurs: 10am-12pm

http://www.mat.ucsb.edu/~g.legrady/academic/courses/08s594/08s594.html

What is the course about?

1. Historical and contemporary still and time-based images & developments
2. To explore image-making created with machines: optics, cameras, etc.
3. The intersection of cameras and computers
4. Artistic possibilities out of scientific, industrial imaging tools, processes, software
Historical Processes to Re-Explore

- Anamorphic reflections
- Multiple-exposure studies

Still and Time-Based Images

- The photograph is the result of light optics, mechanics, and imprinting of the image (chemical, electronic, etc.)
- The cinematic (kinetic) image is a sequence of still images
Camera & Computers

- **Motion tracking**: Locating moving objects through image frame subtraction (current image minus previous image)

- **Compiling live visual data with computer generated data**:

Camera & Computers

- **Multi-Image computation**

- **Machine Vision**: Image recognition and processing
Other Data driven photography

- **Light field photography:** Multi-Image computation allows for digital refocusing
- **Photosynth:** Large collection of photos are analyzed algorithmically for similarities and reconstructed in 3D

Panoramic Dynamic Stitching

- Diverdi Envisor augmented reality panoramic video stitching
Scientific Imaging Perspectives

- **Electron Microscope**: Uses electrons to illuminate and electrostatic and electromagnetic lenses in forming the image.

- **Telescopic**: Measures spectra.

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Electro-Magnetic Spectrum

- We only see a small part of the spectrum but we can measure more.
X-Ray (Röntgen)

- A form of electromagnetic radiation with atom size wavelengths

Infra red

- Longer than visible light, heat responsive used in night vision, spectroscopy, weather
Tomography (MRI, CT, PET, etc.)

- Imaging by sections, assembled through algorithms

Satellite Imaging

- Composite assembled images for weather, land use, ecology, etc.
- Google Tools: Google Earth, Google Sky, Google Ocean
Other Forms of Imaging

- Neutron instead of light
- **Nano imaging**: Microphone used to make movies of molecules

Course Workload & Grading

- Attendance, readings, etc. 40%
- Research project: 30%
- Final project: 30%