

# Projects

# Goals

- One lecture and review of the sub-area
- Some sample implementation

# Graphics algorithms for audio

- For those with a graphics bent
- A sequence of papers in Siggraph by Funkhouser and Tsingos deal with computing room impulse responses using ray-tracing techniques (beam tracing)
- Goal:
  - Summary lecture
  - Some OpenGL code implementing some of the ideas
  - Demo
  - Ideas for future work
  - Other graphics ideas that may have applications

# Independent Component Analysis

- A statistical technique introduced in the neural processing community to solve the mixing problem
- “Cocktail party” problem
- Lots of software and tutorials available online, including a Matlab toolbox
- Goals:
  - Digest material and present a class
  - Implement some audio unmixing code
  - Present some demos

# Automatic Echo Cancellation, Noise Suppression

- General area with its own conference and several papers
- “Bose headphones” (and several others) for suppressing noise
- Using measurement and signal processing and enhancement of sound (in particular speech)

# Cochlear Implants

- Certain forms of nerve deafness can essentially

# Hearing aids

- Monaural and Binaural

# Measurements and analysis of spatial audio with the spherical array

- Goal: Understand the

# Sound technology in games

- Everybody says sound should be important in games
- What is the state of the art?
- Open ended
- Goal: Lecture that reviews existing games and sounds in them