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 Cancelation, 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