

Research Paper

Fundamentals of Sound Engineering, Spring 2009

Deadlines:

Topic selection: April 22, 2009 by 5 PM Pacific Time

5 Annotated Sources: May 13, 2009 by 5 PM Pacific Time

Final Research Paper: June 3, 2009 by 5 PM Pacific Time, although you may turn it in sooner for feedback prior to final submission.

Deadlines are firm. No late work will be accepted unless prior approval has been given. Students **are required to submit an electronic copy** of their work to earsnw@gmail.com as a .doc, .docx, .rtf, or .pdf file. Please do not turn in paper copies unless you are having extreme technical difficulties.

We are aware of the programs that corrupt email attachments to make it appear like a technical error caused the file not to transmit. Students are responsible for checking the validity of the file transmission. Corrupted email attachments or server errors will not be taken as an excuse for turning in an assignment past its due date. Confirmation of receipt and attachment viability will be given as soon as possible, but may not come in time if the assignment is submitted within 2 hours of the due date.

Purpose:

This assignment will allow students to pursue an area of interest within the field of sound engineering. This should be a focused, in-depth investigation and should be supported by reliable sources. Lecture content will span a very wide range of topics, but with minimal depth. This assignment will increase the depth of understanding in isolated subtopics of interest to students.

Topic Selection (10% of overall grade):

By no later than April 22nd, students are required to submit three topic choices, indicating preference rank. Three choices are required because no two students will be allowed to research the same topic. A list of suggested topics can be found at the end of this document, but students are encouraged to suggest their own topics with a brief description of what they hope to uncover. The topic selection component will account for 10% of the total grade.

Annotated Bibliography (40% of overall grade):

By no later than May 13th, students are required to submit an annotated bibliography with 5 sources. Wikipedia articles will not be considered valid sources for this part of the assignment, although they can be included in the final research paper in addition to 5 other sources. Peer-reviewed journal articles will be your most valuable research components, although some topics will have limited peer-reviewed resources available.

For each source, students must concisely (1 paragraph) summarize the information they have discovered as it pertains to their topic. Then, they must critically evaluate each source, discussing the reliability, chronological relevance, and background of the source document (1 paragraph).

Students should use the citation style of their major department, and should declare the style in the email containing the attached assignment. Students are encouraged to use a citation manager such as Zotero, which integrates into Mozilla Firefox and Microsoft word and is available for free download.

A grade will be assigned as per the rubric at the end of this document. Students are encouraged to consult the rubric as they write the bibliography to help receive the maximum points.

An example annotated bibliography can be viewed at: <http://owl.english.purdue.edu/owl/resource/614/02/>

Final paper (50% of final grade):

By no later than June 3rd, students are required to submit a final version of their research paper. This paper should be thoroughly researched, with no less than 5 reliable sources (Wikipedia can be used, but does not count as one of these 5). All resources should be properly cited, as there will be zero tolerance for plagiarism.

1,000 to 2,000 words are expected in the final product. Section headings are optional, and may be appropriate for certain papers. If in doubt, contact your instructor with questions. Figures, charts, and audio appendixes are highly encouraged to enhance the clarity of your report or to make it more interesting.

Regardless of topic selection, students should seek to interpret and discuss the relevance of the information they have uncovered to modern sound engineering and musical enjoyment.

The final paper will be graded as per the rubric at the end of this document. Students are encouraged to consult the rubric as they write the paper to help receive the maximum points.

Sample topics (some may need to be narrowed):

The following list is by no means exhaustive, and students are encouraged to suggest their own topics of interest. Many of these topics will be discussed briefly in class. All topics must be approved by your instructor. As a side note, many of the scientific and artistic topics can be approached historically. **An excellent resource for finding additional topics is the Audio Engineering Society's convention schedule, which has hundreds of diverse audio topics that are guaranteed to have a wealth of resources associated with them.**

Scientific/engineering topics:

1. Design principles and development of audio equipment
 - a. Audio transformers
 - b. Amplifiers
 - c. Equalizers
 - d. Loudspeaker enclosures
 - e. Speaker arrays
 - f. Cone drivers
 - g. Compression drivers
 - h. Phase plugs
 - i. Horns
2. Modeling, measurement and prediction
 - a. Physical modeling

- b. Computerized and computational modeling techniques
 - c. Auralization
 - d. Fourier theory
 - e. Maximum length sequence system analysis
 - f. Impulse and broadening
3. Signal processing
 - a. Frequency filtering
 - b. Delays
 - c. Digitization
 - d. Encoding
 - e. Dynamics processing
 - f. Effects processing
 4. Acoustics
 - a. Anechoic chamber theory
 - b. Concert hall and venue acoustics
 - c. Reverb chambers
 - d. Variable acoustics
 - e. Electronically assisted or altered environmental acoustics
 - f. Recording studio acoustics
 - g. Home theater and
 5. Microphones
 - a. The Decca Tree, or any other specific spatial microphone technique
 - b. Boundary microphones
 - c. Directionality in microphones
 - d. Instrument-specific microphone techniques
 6. Psychoacoustics and hearing
 - a. Synesthesia
 - b. Echolocation
 - c. Evolution of the ear
 - d. Directional hearing
 - e. Head, pinna and torso transfer functions
 7. Other
 - a. Seismology in relation to audio
 - b. Ultrasound and infrasound
 - c. Sonar
3. Paradigm spatial mixing techniques
 4. Use of compression
 5. Paradigm electronic music (please pick a specific studio, a band, or a producer)
 6. Biography of a noteworthy producer or engineer
 7. History of a venue or studio (keep it relevant to sound)
 8. Revolutionary techniques in live sound or studio sound
 9. Instrument-specific microphone techniques
 10. Cultural and regional mixing and producing techniques
 11. Cinema sound
 12. Landmark sound foley techniques
 13. Theater and musical theater sound techniques

Artistic topics:

1. Mixing techniques of a specific time period, location, producer/engineer, band, or album (live or studio)
2. Mixing approaches to a specific style of music (live or studio)

	Points possible	Points earned	Notes
Topic Selection			
Topic selections were submitted on time.	10		
Annotated Bibliography			
Bibliography contained 5 properly-cited, viable sources. Online sources will be checked.	10		2 points assigned per source. Wikipedia is not a valid source for this exercise.
Source summaries concisely and accurately conveyed the relevant information from the source.	10		2 points assigned per source.
The origin of information is described in detail (old textbook, recent journal article, etc.). Evaluations critically evaluate the accuracy, bias, and historical relevance of the source.	10		2 points assigned per source.
Formatting, style, presentation and grammar	10		Use a legibly-sized, standard font (i.e. Times, Garamond, Calibri, etc.).
Final Research Paper			
The essential facts and background information have been adequately, congruently, and accurately detailed.	10		When researching and writing, ask yourself whether or not the information is sufficient to draw relevant conclusions from. Are there clear holes or discrepancies in the information you have found? If so, keep digging; if you really can't uncover the key piece of information, be sure to state this.
Writing demonstrates an understanding of the implications of the essential facts. Reasonable conclusions have been drawn.	10		Can you demonstrate how the facts you have collected relate to each other? If you're having trouble understanding the meaning of your information, keep digging, or talk to your instructor.
Relevance to modern sound engineering has been clearly illustrated and explained.	10		Many of the old artistic and engineering techniques are still used today; others aren't. Where does your topic fit in today's audio world? If it has no place, why is that and what does it mean to the engineers, producers, musicians and listeners?
All sources are cited properly.	10		Use the citation style of your major department, and state what that style is in the email containing your attached assignment. Any information that is not "common knowledge" must be cited.
Formatting, style, presentation and grammar	10		Use a legibly-sized, standard font (i.e. Times, Garamond, Calibri, etc.). Include figures and charts where appropriate to support your explanation.
Total percentage		0	