Project Year
2004

Project Team
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Project Title
Vertebrate Auditory Systems

Audience
Upper-level undergraduates in the course *Vertebrate Auditory Systems: Form and Function* and similar courses in the field of neuroscience

Pedagogical Issue
Advanced courses in neuroscience often assume that students possess sufficient foundational knowledge. However, in order to bring the class as a whole up to speed, it is sometimes necessary to sacrifice class time to review fundamental concepts. There is currently no single resource that presents fundamental material in vertebrate audition and acoustics in a coupled, comprehensive manner.

Solution
We propose to create a series of virtual mini-lectures and interactive quizzes that focus on presenting the basics of auditory neuroscience and the physics of sound, so as to free up more in-class time for instruction on more advanced material.

Technologies Used
Courseware (WebCT development), Macromedia Flash

Project Abstract
Sensory neurobiology offers tremendous opportunities for the study of form and function in biological systems. With regard to the modality of hearing, a comparative study of vertebrate auditory systems and acoustics may provide students with essential tools for elucidating structure-function relationships. Such study necessarily includes the coverage of a range of complex material. The gateway to higher level topics is, however, hinged on an extensive range of introductory material, such as basic anatomy and signal processing techniques. In the setting of a one-semester course, time spent on review of such foundational bridges may result in the sacrifice of some advanced topics. To address this problem, this project team will create a CD with a series of virtual mini-lectures (using QuickTime or Macromedia Flash technology) that focuses on presenting the basics of auditory neuroscience and the physics of sound. Students may use the CD for review outside of class, thereby allowing the instructor of 080.342

(Vertebrate Auditory Systems: Form & Function) and instructors of similar courses in the field of neuroscience to devote more in-class time to the teaching and discussion of advanced topics. Accompanying interactive quizzes will serve as a means of self-assessment for students and will help to prepare them for more meaningful, scholarly discussion. As there are many images, charts, diagrams, and animations associated with auditory science, the virtual lectures will provide an extra avenue for presenting such material beyond the confines of the text or lectures. Christopher Flory, the proposed Technology Fellow, is a student of bioengineering and is experienced in programming and digital imaging. Chris will be expected to create much of the graphic elements, and Dr. Ramcharitar will contribute to any text and narrative. Weekly meetings will be used to assess progress and to facilitate needed adaptations. The project will be completed within a 12-week period (25 - 30 hrs per week) during the summer of 2004. The budget will be used to pay the Technology Fellow a summer stipend and to secure permissions for use of critical copyright material. In the spring of 2005, upper-level undergraduates enrolled in the course 080.342 (Vertebrate Auditory Systems), will use the CD as an additional didactic resource. In-class quizzes will be designed to test the efficacy of the new materials; review sessions with students will be used to assess the technology. Faculty in the fields of sensory neurobiology, audition and acoustics may find the CD to be an effective way to teach fundamental concepts. It is intended that 080.342 will be offered every spring semester as an upper-level undergraduate course in neuroscience, and this will facilitate multiple uses and ongoing maintenance of the virtual lecture CD. In addition, acoustic scientists, biophysicists and biomedical engineers might also find access to such a resource to be of utility in their training programs. Dr. Ramcharitar also expects feedback and CD reviews from members of the auditory units of JHU and UMD (College Park).