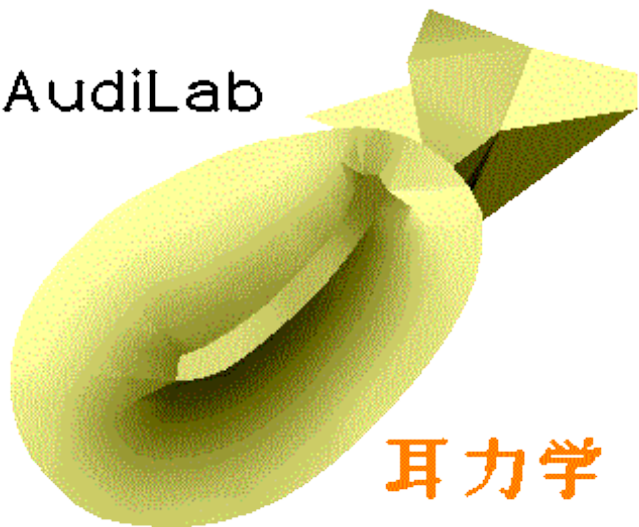# AudiLab

耳力学

Auditory Mechanics Laboratory

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We build mathematical models of the ear, to help us design better diagnostic tests and better middle-ear prostheses.

We develop software for creating 3-D models of complex natural structures.

See experimental measurements of how the eardrum moves; admire an interactive 3-D teaching model of the ear; watch a finite-element model responding to sound.

Our research

Our software

Potential student projects

Other local stuff

- Modelling middle-ear mechanics: material for course *Selected Topics in BioMedical Engineering* (BMDE-501)
- Diverse and distributed domains: material for course *Biomedical modelling and identification* (BMDE-502)
- Web Interface to Finite Elements: generate a mesh and do a finite-element simulation, from the comfort of your own browser. (Flaky - please let me know if you want to use this.)
- davis3d: Dynamic Anatomy Visualization in 3-D
- 3Dear tutorial on the anatomy of the middle and inner ear, making use of interactive 3-D models and including a quiz
- oto3d: teaching site for the ear, including a 3-D histology-based VRML model of the ear, and photos of a large-scale physical model
- anatomy3d: teaching site for anatomy, including 3-D VRML models of the head and pelvis based on data from the Visible Human Project. The models are presented using a Java applet for selecting structures, controlling transparency, etc.
- Examples of animated 3-D models: talking blockhead, eardrum
- Various sources of data that we use for our modelling

Other hearing resources

- Information about noise-induced hearing loss
  - [Dangerous Decibels](#)
  - [Wise Ears!](#)
  - [Hearing-Blog.com](#) by Prof. G. Fleischer
- Information about newborn hearing screening
  - [Why Universal Newborn Hearing screening is important](#) from the Canadian Academy of Audiology
  - [Newborn Hearing Screening](#) from the Hearing Foundation of Canada
  - 2008 Sep: [Newborn hearing-screening programs launched in Montréal](#) at the Royal Victoria, Montréal Children's and Ste-Justine hospitals
  - 2009 Jul: [Universal newborn hearing screening adopted in Québec](#)
- [Association for Research in Otolaryngology](#) (includes meeting [abstracts](#))
- [Acoustical Society of America](#)
- [AAO-HNS](#): American Academy of Otolaryngology-Head and Neck Surgery
- [Canadian Society of Otolaryngology - Head & Neck Surgery](#)
- [Canadian Acoustical Association](#)
- [3-D Virtual Models of the Human Temporal Bone and Related Structures](#) (Eaton-Peabody Lab, Mass. Eye & Ear)
- [Temporal (ear) bone anatomy](#) (annotated histological sections) by Kevin Kavanagh
- [HEAR Center](#), Pasadena (CA)
- Other [hearing](#)-related WWW sites

Other modelling resources

- [Finite-element resources](#) (Young and MacPhedran, Univ. Saskatchewan)
- [International Society of Biomechanics](#)

Other resources

- [Animal-care theory training course](#) (McGill)
- [biomch-l](#) discussion group
- Hawkins' [Tissue Mechanics](#)