
ELEN E6820:

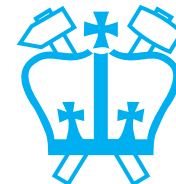
Speech and Audio Processing and Recognition

Columbia University Dept. of Electrical Engineering
Spring 2003

Professor: Dan Ellis <dpwe@ee.columbia.edu>

Web site:

<http://www.ee.columbia.edu/~dpwe/e6820/>



General information

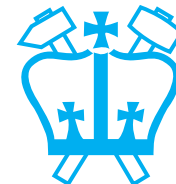
- **Goals:**
 - survey topics in sound analysis & processing
 - develop an intuition for sound signals
 - learn some specific technologies (esp. ASR)
- **Course structure:**
 - weekly assignments (25%)
 - midterm exam (25%)
 - final project (50%)

- **Text:**

*Speech and Audio Signal
Processing*

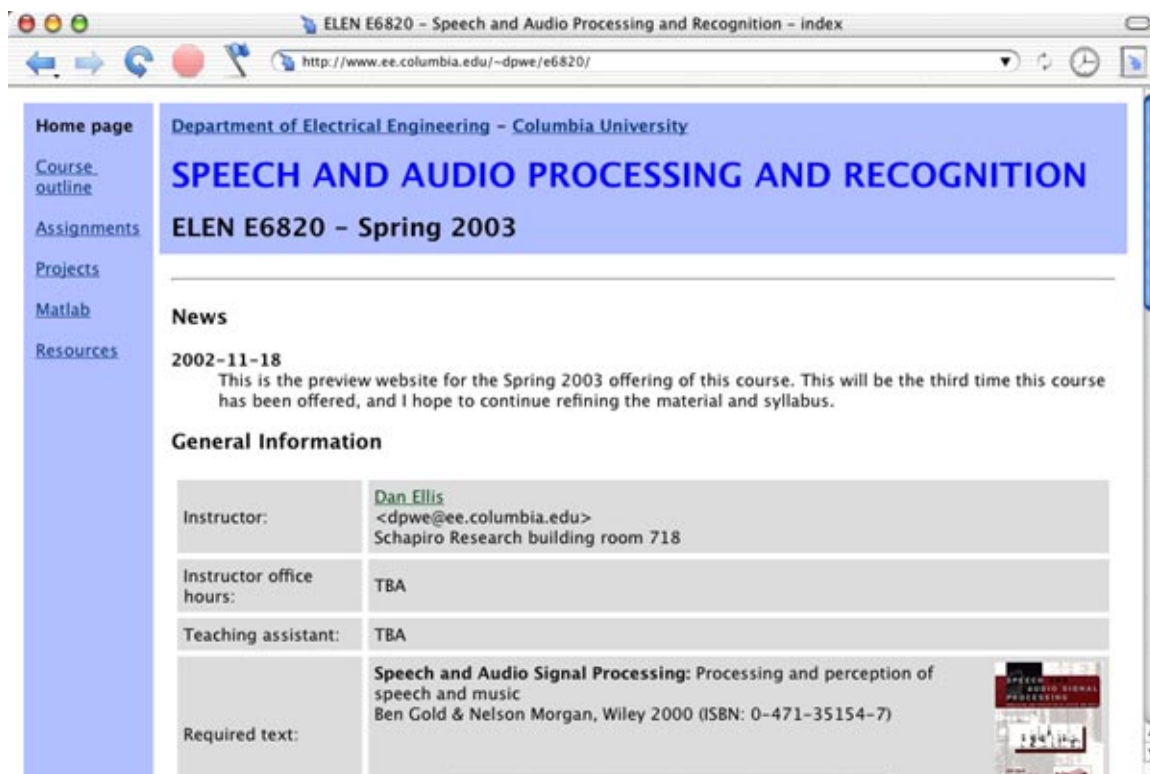
Ben Gold & Nelson Morgan,
Wiley, 2000

ISBN: 0-471-35154-7



Web-based

- **Course website:**
<http://www.ee.columbia.edu/~dpwe/e6820/>
for lecture notes, problem sets, examples, ...



The screenshot shows a web browser window with the address bar displaying <http://www.ee.columbia.edu/~dpwe/e6820/>. The page content includes a navigation menu on the left with links for Home page, Course outline, Assignments, Projects, Matlab, and Resources. The main content area features a blue header with the text "Department of Electrical Engineering - Columbia University" and "SPEECH AND AUDIO PROCESSING AND RECOGNITION ELEN E6820 - Spring 2003". Below this is a "News" section dated 2002-11-18, stating that this is the preview website for the Spring 2003 offering. A "General Information" section follows, containing a table with the following details:

Instructor:	Dan Ellis <dpwe@ee.columbia.edu> Schapiro Research building room 718
Instructor office hours:	TBA
Teaching assistant:	TBA
Required text:	Speech and Audio Signal Processing: Processing and perception of speech and music Ben Gold & Nelson Morgan, Wiley 2000 (ISBN: 0-471-35154-7)

- **+ student web pages for homework etc.**



Course outline

Fundamentals

L1:
DSP

L2:
Acoustics

L3:
**Pattern
recognition**

L4:
**Auditory
perception**

Audio processing

L5:
**Signal
models**

L6:
**Music
analysis/
synthesis**

L7:
**Audio
compression**

L8:
**Spatial sound
& rendering**

Speech recognition

L9:
**Speech
features**

L10:
**Sequence
recognition**

L11:
**Recognizer
training**

L12:
**Systems &
applications**



Weekly Assignments

- **Research papers**
 - journal & conference publications
 - summarize & discuss in class
 - written summaries on web page
- **Practical experiments**
 - MATLAB-based (+ Signal Processing Toolbox)
 - direct experience of sound processing
 - skills for project
- **Book sections**
 - + questions from book



Final Project

- **Most significant part of course (50% of grade)**
- **Oral proposals mid-semester;
Presentations in final class
+ website**
- **Scope**
 - practical (Matlab recommended)
 - identify a problem; try some solutions
 - evaluation
- **Topic**
 - few restrictions within world of audio
 - investigate other resources
 - develop in discussion with me



Examples of past projects

