Course description

A critical element of interactive systems is managing the dialog between the system and the user. This half-semester graduate seminar will explore multiple approaches to implementing dialog management components, both symbolic and statistical, including what contextual information must be represented in the dialog states and the decision processes to move from one state to another. Students will implement a dialog manager using industry standard tools.

The seminar format will emphasize experiential learning and collaborative efforts. The work will include readings, discussion, and student presentations on current research and implementations of dialog management systems, as well as those available commercially and open-source. The final project will be to build a dialog manager either as a part of a voice application or that can be evaluated using the data and framework of the most recent dialog state tracking evaluation.

Learning goals

- Students learn to do independent research to find works that report on research systems and tools implementing the different approaches to dialog management.
- Students learn to critically evaluate the performance of commercially available and open source systems and tools.
- Students gain skill in summarizing and presenting the findings from their research.
- Students learn to use industry standard tools and languages build an interactive dialog system with a sophisticated dialog management component.

Topics

Each week will cover one of the following topics. In addition to the assigned papers, students will read and present on similar work at other research institutions and evaluate existing dialog management systems both in commercial use and research.

- Agenda based models, such as CMU's Ravenclaw
- POMDPs (Partially Ordered Markov Decision Processes) and other statistical approaches
- Managing multimodal interactions
- Dialog repair strategies
- Dialog state tracking
- Evaluation of approaches to dialog state tracking conducted by SigDial
- Belief and context modeling
- Tools for building interactive systems
  - https://wit.ai
  - http://appinventor.mit.edu/explore/

Schedule

Topics and assignments for each class are posted on the schedule page. Please check this regularly, as
it may change throughout the year.

**Grading**

- Class participation: 20%
- Presentations and written summaries: 30%
- Final project: 50%

If you are a student with a documented disability on record at Brandeis University and which to have reasonable accommodations made for you in this class, please see me immediately.

Success in this 2 credit hour course is based on the expectation that students will spend a minimum of 9 hours of study time per week in preparation for class (readings, papers, discussion sections, preparation for exams, etc.).

**Prerequisites**

LING131 or Intro to Linguistics or permission of the instructor