Experiences with Undergraduate Research
(Computationally Analyzing Audio, Video, and Transcriptions of Team Conversations)

Professor Diane Litman
Natural Language Processing (NLP)

• Getting computers to perform useful and interesting tasks involving human languages
  – languages such as English, Spanish, Chinese, etc.
  – as opposed to computer languages such as Python
Why is NLP needed?

– An enormous amount of machine readable text, audio, and video is now available

– Conversational agents such as Siri and Alexa are becoming an important form of human-computer communication
Teams Project: Entrainment and Task Success in Team Conversations
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• Multi-party entrainment measures that are computable using NLP

• Applications
  – Conversational agents
  – Browsers for (un)succesful teams
Experimentally Collected Data

• Experimental Design  
  – Team Training or Not  
  – First vs. Second Games

• Audio-Video  
  – 47 hours  
  – 63 teams

• Questionnaires  
  – 216 individuals
What teams say (transcriptions)

M: And then [I’m here.]
E: [Oh.]
P: [Yeah] probably wanna save [Whispering Garden.]
E: [Whispering- Yeah.]
M: [Uh yeah, that’s one,] [two,]
P: [Yeah.]
M: [three.]
P: [Perfect.]
How teams say it (audio)
How teams say it (video)

• Non-verbal communication
  – Gaze
  – Gesture
  – Facial expressions
  – Etc.
Litman Lab Undergraduate Research

Connecting

– I recruit (class performance, email to colleagues)
– I advertise (Pitt’s First Experiences in Research Program)
– Students initiate contact
  • Ideal prerequisites: one or more of AI, NLP, ML

Implementing

– Employment: REU funds from the National Science Foundation
– Credit: CS Capstone project
  • lab or office space
  • Individual and group meetings
Selected Prior Projects / Outcomes

• **Exploiting Word-level Features for Emotion Prediction**
  - First-authored publications
  - CS Day Award for Best Undergraduate Student Poster
  - Honorable Mention in the Computing Research Association's Outstanding Undergraduate Award
  - MS from Brown University

• **In the Zone: Towards Detecting Student Zoning Out using Supervised Machine Learning**

• **Examining the Impacts of Dialogue Content and System Automation on Affect Models in a Spoken Tutorial Dialogue System**
  - First-authored publications
  - CS Day Award for Best Undergraduate Student Poster
  - National Science Foundation Graduate Research Fellowship
  - now at U of Toronto

• **Differences in User Responses to a Wizard-of-Oz versus Automated System**
  - First-authored publications
  - Honorable Mention in Computing Research Association's Outstanding Undergraduate Researcher Award
  - now at U of Texas