Rivka Levitan

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EDUCATION

Columbia University, MS-PhD Program (Computer Science) **Sept 2009 – present**

Brooklyn College, B.S. (Computer and Information Sciences) **Sept 2009**
Summa cum laude

RESEARCH INTERESTS

Spoken Language Processing

I am currently working with Dr. Julia Hirschberg on investigating and modelling entrainment in spoken corpora. Among other topics, I am interested in the identification of the acoustic, prosodic and conversational features on which speakers entrain, at what point conversational partners entrain, and what entrainment can add to our understanding of discourse acts such as turn taking.

HONORS AND AWARDS

- **Honorable Mention, NSF Graduate Research Fellowship** 2009
- **CRA-DREU participant** Summer 2009
- **Frank Wertheimer Award** 2009
  Awarded by the Math Department at Brooklyn College for academic excellence.
- **Jack Wolfe Award** 2009
  Awarded by the Computer Science Department at Brooklyn College for academic excellence.
- **Marge Magner Internship Award** Summer 2008
- **National Merit Scholarship Finalist** 2007

PROJECTS

Adult Perception of Emotional Speech in Children of Different Ages
For a class project in 2009, I had children from grades 1, 3 and 6 play a simple computer game that I created in Java. There were six rounds to the game, of which they won four rounds and lost two. After each round, they were asked to choose a prize if they had won or give one up if they had lost, providing us with a lexically neutral sample of happy or sad speech. Adults were then asked to rate the children's speech using a web interface, indicating how old they thought the child was, whether they thought the child had won or lost, and how invested they thought the child was in the game. Examining the acoustic

and prosodic features of the children's speech revealed that the features adults used to decide whether a child was sad or happy were different from the features that actually differed between the children's positive or negative speech.

Improving Probability Estimation Trees for Ranking
I worked on this project with Dr. Haimonti Dutta as part of my participation in the CRA DREU in summer 2009. Decision tree learning algorithms are often used in machine learning for classification problems. They can also be used for ranking by calculating, for each instance, the probability that it will fall within the class it is assigned. Decision trees acting as probability estimators, however, are often observed to produce bad probability estimates. Specifically, every instance in a node is assigned the same probability, resulting in a proliferation of ties, which reduces the results' usefulness for ranking. Sparse training sets may also lead to skewed estimates. We explored two techniques for producing improved probability estimates. To more accurately reflect the probability of class predictions, we weighted each leaf by the proportion of training instances that fell within it. To eliminate the problem of ties, we implemented a kernel density estimate at the leaf.

A Graphical Interface for Finding Tandem Repeats
For an honors project during my senior year as an undergraduate, I worked with Dr. Dina Sokol on her project building a database of tandem repeats. Much of the human genome consists of tandemly repeated DNA sequences, which vary widely among individuals. They are of interest to researchers in areas such as gene prediction, human identity verification, and population studies. I built a servlet-based website with a graphical interface for the Smith-Waterman algorithm to find and display all general repeats within a sequence of characters.

WORK EXPERIENCE

- **Sixth grade math teacher at Prospect Park Elementary School** 2008-09
- **First grade assistant teacher at Prospect Park Elementary School** 2007-08
- **Research assistant at Cornell Weill** Summer 2008
- **Intern at INCHOIR at Columbia Presbytarian** Summer 2006
  Helped develop web-based data management system
  Rewrote brochures intended to educate members of minority populations about breast cancer into understandable English.

ACTIVITIES

- Board member of Women in Computer Science, Columbia University present
- Volunteer, tutoring children of immigrant parents 2004-06

SKILLS

HTML, CSS, AJAX, Java, C, C++, Perl
R, Praat