

Columbia University
450 Computer Science Building
New York, NY, 10027

Office Phone: 212-939-7111/7147

fadi@cs.columbia.edu
<http://www.cs.columbia.edu/~fadi>

Fadi Biadsy

Education

- **Ph.D.** Computer Science, Columbia University, Jan, 2006 – Feb, 2011 (*Expected*)
- **M.Sc.** Summa cum Laude in Computer Science, Ben-Gurion University, July 2005
- **B.Sc.** Computer Science and Mathematics, Ben-Gurion University, July 2002

Employment

- Summer Internship at IBM T.J. Watson Research Center, Yorktown Heights, NY, 2009 and 2010

Worked as part of the large vocabulary conversational speech recognition team to improve pronunciation modeling and to better recognize dialectal speech.

Hosts: Lidia Mangu and Hagen Soltau

- Senior Software Developer, Dalet Digital Media Systems, New York, 2004 – 2005

Lead developer of a real-time broadcast system for automated multi-channel radio stations. The application is used at XM Satellite Radio for broadcasting more than 120 channels and at CBC for broadcasting all over Canada.

- Software Developer, Gefen Technology (subsidiary of Dalet), Israel, 2001 – 2004

Lead developer of a self-stabilized framework for heterogeneous and homogeneous agents in the network. The system provides fault tolerance and persistence and allows users to interact and manipulate sets of agents to perform specific offline and online tasks.

Teaching Experience

- Teaching Assistant: Spoken Language Processing, Spring 2008
- Teaching Assistant: NLP for the Web, Spring 2008

- Course Manager: Natural Language Processing, Summer 2007 and Fall 2007

Academic Research

- Dialect and Accent Recognition

We suggest methods to identify the regional dialect/accent of a speaker given a short sample of his/her speech. We have explored different modeling techniques, including generative and discriminative models as well as a novel kernel-based method. We employed a various number of features, including frame-based acoustic features, phonetic, phonotactic, and high-level prosodic features. Our system can also be used to automatically extract linguistic knowledge, particularly subtle phonetic differences that contribute to distinguishing dialects.

- Improving Arabic Automatic Speech Recognition on Dialectal Speech

Joint work with Julia Hirschberg and the IBM Speech Recognition Team

There are commercially available Automatic Speech Recognition (ASR) systems for recognizing Modern Standard Arabic with low error rates. They are typically used to recognize broadcast news. However, these recognizers fail when a native Arabic speaker code switches to his/her regional dialect, which often occurs in conversational speech. We are working on employing our Arabic dialect recognition system prior to ASR to adapt the ASR pronunciation and acoustic models.

- Charismatic Speech

Joint work with Julia Hirschberg and Andrew Rosenberg

Automatic analysis of a speakers' charisma can serve to diagnose or improve presentational skills as well as (potentially), to identify new political leaders, or to improve speech synthesis. We identify acoustic, prosodic, and lexical features that correlate with charisma and compare perceptions of charisma across cultures (American English, Palestinian Arabic and Swedish)

- Automatic Biography Production

Joint work with Julia Hirschberg and Kathy McKeown

This work was part of DARPA GALE distillation project. We implemented a multi-document sentence-extraction system to produce a biography of a person, given a name, from text and spoken news sources. We utilized Wikipedia to automatically construct a corpus of biographical sentences and TDT4 to construct a corpus of non-biographical sentences. We built a biographical-sentence classifier from these corpora and an SVM regression model for sentence ordering from the Wikipedia corpus.

- Online Handwriting Recognition

Joint work with Jihad El-Sana and Nizar Habash

In this work we explored the difficulties inherent in the problem of online handwriting recognition of Arabic script. Our approach combined computational geometric and machine learning techniques. We made use of left-to-right HMMs to model letters and grammar networks to model word parts. We introduced a novel approach that turned the complexity of delayed strokes from an obstacle in recognition into a factor that improved recognition accuracy.

Honors & Awards

- Won a 2010 IBM Ph.D. Scholarship
- M.Sc. Summa cum Laude from Ben-Gurion University, July 2005.
- Received “The Best for Industry” Scholarship, Ben-Gurion University, 2000 – 2001.

Patent

Online Arabic Handwriting Recognition (WO/2008/012824), J. El-Sana and F. Biadisy

Invited Talks

- Invited lecturer in the Columbia speech processing and NLP classes, 2009 and 2010
- At&t - NLP and Speech Group, Nov 2009
- IBM Statistical Machine Learning and Its Application (SMiLe) workshop, Oct 2009

Programming Skills

- Five years of experience developing in C++
- Nine years of experience developing in Java
- Fluent in Scheme and several scripting languages

Natural Languages

Native speaker of Arabic. Fluent in Hebrew and English.

Publications

2010

Fadi Biadisy, Julia Hirschberg, Michael Collins, "Dialect Recognition Using a Phone-GMM-Supervector-Based SVM Kernel", Japan, Interspeech 2010

Fadi Biadisy, Hagen Soltau, Lidia Mangu, Jiri Navratil, Julia Hirschberg, "Discriminative Phonotactics for Dialect Recognition Using Context-Dependent Phone Classifiers", Brno, Odyssey 2010

2009

Fadi Biadisy, Julia Hirschberg, "Using Prosody and Phonotactics in Arabic Dialect Identification," Interspeech 09, Brighton, U.K., Sep 2009

Fadi Biadisy, Nizar Habash, Julia Hirschberg, "Improving the Arabic Pronunciation Dictionary for Phone and Word Recognition with Linguistically-Based Pronunciation Rules," HLT/NAACL 2009, May 2009

Fadi Biadisy, Julia Hirschberg, Nizar Habash, "Spoken Arabic Dialect Identification Using Phonotactic Modeling," EACL2009 Workshop on Computational Approaches to Semitic Languages, Mar 2009

Apoorv Agarwal, Fadi Biadisy, Kathleen Mckeown, "Contextual Phrase-Level Polarity Analysis using Lexical Affect Scoring and Syntactic N-grams", EACL09, Mar 2009

2008

Fadi Biadisy, Julia Hirschberg, and Elena Filatova, "An Unsupervised Approach to Biography Production using Wikipedia," ACL 08, Columbus, OH, USA, Jun 2008

Fadi Biadisy, Andrew Rosenberg, Rolf Carlson, Julia Hirschberg, and Eva Strangert, "A Cross-Cultural Comparison of American, Palestinian, and Swedish Perception of Charismatic Speech," Speech Prosody 08, Campinas, Brazil, May 2008

2007

Fadi Biadisy, Julia Hirschberg, Andrew Rosenberg, and Wisam Dakka, "Comparing American and Palestinian Perceptions of Charisma Using Acoustic-Prosodic and Lexical Analysis," Interspeech 2007, Belgium, Antwerp

2006

Fadi Biadisy, Jihad El-Sana, and Nizar Habash "Online Arabic Handwriting Recognition using Hidden Markov Models," IWFHR'10 2006, France.

2005

Fadi Biadisy, "Online Arabic Handwriting Recognition," M.Sc. thesis, Ben-Gurion University, June 2005.

References

- 1. Prof. Julia Hirschberg (PhD Advisor)**
Columbia University
Department of Computer Science
New York, N.Y. 10027
Office: (212) 939-7114
julia@cs.columbia.edu
- 2. Prof. Kathy McKeown (Secondary Advisor)**
Columbia University
Department of Computer Science
New York, N.Y. 10027
Office: (212) 939-7118
kathy@cs.columbia.edu
- 3. Dr. Nizar Habash**
Columbia University
Center for Computational Learning Systems
New York, N.Y. 10027
habash@ccls.columbia.edu