

Murat Saraçlar

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- EDUCATION**
- Johns Hopkins University**, Baltimore, MD
Ph.D. in Electrical Engineering, 2001
Title: Pronunciation modeling for conversational speech recognition.
Committee: Prof F. Jelinek, Prof A. Andreou, Prof G. Meyer, Dr. S. Khudanpur, Dr. M. Riley.
M.S.E. in Electrical Engineering, 1997
- Bilkent University**, Ankara, Turkey
B.S in Electrical Engineering, 1994
- TED Ankara College**, Ankara, Turkey
- EXPERIENCE**
- Assistant Professor** *Jan 2005 – present*
Electrical and Electronics Engineering Department **Bogaziçi University**
Speech and Language Processing
- Senior Technical Specialist** *May 2004 – Jan 2005*
Senior Technical Staff Member *September 2000 – May 2004*
AT&T Labs – Research **Florham Park, NJ**
Automatic speech recognition (ASR) for multimedia analysis systems.
- Research Assistant** *September 1996 – September 2000*
Center for Language and Speech Processing **Johns Hopkins University**
Pronunciation Modeling for Large Vocabulary Conversational Speech Recognition
- Teaching Assistant** *Sep 1994 – May 1996; Jan 1999 – May 1999*
Electrical and Computer Engineering Department **Johns Hopkins University**
Electrical and Computer Engineering Laboratory; Signals and Systems; Microprocessor Laboratory
Information Extraction from Speech and Text
- EXPERIENCE (SUMMER WORKSHOPS AND INTERNSHIPS)**
- Senior Researcher** *July 2008 – August 2008*
CLSP Summer Workshop on Human Language Technology
Multilingual Spoken Term Detection Group Leader: R. Sproat
- Group Leader** *July 2007 – August 2007*
Enterface'07: The SIMILAR NoE Summer Workshop on Multimodal Interfaces
Speech and Sliding Text Aided Sign Retrieval from Hearing Impaired Sign News Videos,
Multimodal Speaker Identity Conversion, Mobile-Phone Based Gesture Recognition.
- Researcher** *July 1997 – August 1997*
DoD Workshop on Innovative Techniques for LVCSR at Johns Hopkins University
Pronunciation Modeling Group Group Leader: M. Riley
- Student Assistant** *July 1996 – August 1996*
DoD Workshop on Innovative Techniques for LVCSR at Johns Hopkins University
Automatic Learning of Word Pronunciations from Data Group Leader: M. Weintraub
- Summer Intern** *June 1995 – August 1995*
AT&T Bell Laboratories **Murray Hill, NJ**
Automatic Learning of Interpretation Rules for Speech Understanding Mentor: R. Pieraccini

- RESEARCH INTERESTS Speech and Language Processing;
Large Vocabulary Automatic Speech Recognition: Acoustic, Pronunciation and Language Modeling;
Statistical Natural Language Processing;
Applications of Speech Recognition: Spoken Information Retrieval, Speech Understanding;
Statistical and Information Theoretic Methods in Learning.
- PUBLICATIONS E. Arisoy, D. Can, S. Parlak, H. Sak, M. Saraclar.
Journal Articles Turkish Broadcast News Transcription and Retrieval.
IEEE Transactions on Audio, Speech and Language Processing, To appear in May 2009.
- E. Arisoy and M. Saraclar.
Dynamic Vocabulary Adaptation for LVCSR of Turkish.
IEEE Transactions on Audio, Speech and Language Processing, To appear in Jan 2009.
- O. Aran, I. Ari, L. Akarun, P. Campr, M. Hruz, E. Dikici, S. Parlak, M. Saraclar.
Speech and Sliding Text Aided Sign Retrieval from Hearing Impaired Sign News Videos.
Journal on Multimodal User Interfaces, June 2008.
- C. Chelba, T.J. Hazen, and M. Saraclar.
Retrieval and Browsing of Spoken Content.
IEEE Signal Processing Magazine, 25(3):39-49, May 2008.
- M. Creutz, T. Hirsimki, M. Kurimo, A. Puurula, J. Pylkknen, V. Siivola, M. Varjokallio, E. Arisoy, M. Saraclar, and A. Stolcke.
Morph-Based Speech Recognition and Modeling of Out-of-Vocabulary Words Across Languages.
ACM Transactions on Speech and Language Processing, 5.1 Article 3, December 2007.
- B. Roark, M. Saraclar, and M. Collins.
Discriminative n-gram language modeling.
Computer Speech and Language, 21(2):373-392, April 2007.
- M. Saraclar and B. Roark.
Utterance classification with discriminative language modeling.
Speech Communication, 48(3-4):276-287, March-April 2006.
- M. Saraclar and S. Khudanpur.
Pronunciation change in conversational speech and its implications for automatic speech recognition.
Computer Speech and Language, 18(4):375-395, October 2004.
- M. Saraclar, H. Nock, and S. Khudanpur.
Pronunciation modeling by sharing gaussian densities across phonetic models.
Computer Speech and Language, 14(2):137-160, April 2000.
- M. Riley, W. Byrne, M. Finke, S. Khudanpur, A. Ljolje, J. McDonough, H. Nock, M. Saraclar, C. Wooters, and G. Zavaliagos.
Stochastic pronunciation modelling from hand-labelled phonetic corpora.
Speech Communication, 29(2-4):209-224, November 1999.
- PUBLICATIONS E. Arisoy, B. Roark, I. Shafran, M. Saraclar.
Peer-Reviewed Conference Papers Discriminative N-gram Language Modeling for Turkish.
To appear in *Proceedings of Interspeech*, Brisbane, Australia, 2008.
- H. Sak, T. Güngör and M. Saraclar.

Turkish Language Resources: Morphological Parser, Morphological Disambiguator and Web Corpus. In *Proceedings of the 6th International Conference on Natural Language Processing, GoTAL*, 2008.

S. Parlak and M. Saraclar.

Spoken Term Detection for Turkish Broadcast News.

In *Proceedings of the IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, Las Vegas, USA, 2008.

E. Arisoy, H. Sak and M. Saraclar.

Language Modeling for Automatic Turkish Broadcast News Transcription.

In *Proceedings of Interspeech – Eurospeech*, Antwerp, Belgium, 2007.

Z. Liu and M. Saraclar.

Speaker Segmentation and Adaptation for Speech Recognition on Multiple-Speaker Audio Conference Data.

In *Proceedings of the International Conference on Multimedia and Expo (ICME)*, Beijing, China, 2007.

M. Creutz, T. Hirsimäki, M. Kurimo, A. Puurula, J. Pylkkönen, V. Siivola, M. Varjokallio, E. Arisoy, M. Saraclar, and A. Stolcke.

Analysis of Morph-Based Speech Recognition and the Modeling of Out-of-Vocabulary Words Across Languages.

In *Proceedings of Human Language Technologies / The Annual Conference of the North American Chapter of the Association for Computational Linguistics (HLT-NAACL 2007)*, Rochester, NY, USA, 2007.

H. Sak, T. Güngör and M. Saraclar.

Morphological Disambiguation of Turkish Text with Perceptron Algorithm.

In *Proceedings of the 8th International Conference on Computational Linguistics and Intelligent Text Processing (CICLing)*, Mexico City, Mexico, 2007.

E. Arisoy and M. Saraclar.

Lattice extension and rescoring based approaches for LVCSR of Turkish.

In *Proceedings of the International Conference on Spoken Language Processing (Interspeech 2006 - ICSLP)*, Pittsburgh, PA, USA, 2006.

M. Kurimo, M. Creutz, M. Varjokallio, E. Arisoy, and M. Saraclar.

Unsupervised segmentation of words into morphemes – Morpho Challenge 2005: Applications to automatic speech recognition.

In *Proceedings of the International Conference on Spoken Language Processing (Interspeech 2006 - ICSLP)*, Pittsburgh, PA, USA, 2006.

M. Kurimo, A. Puurula, E. Arisoy, V. Siivola, T. Hirsimäki, J. Pylkkönen, T. Alumäe, and M. Saraclar. Unlimited vocabulary speech recognition for agglutinative languages. In *Proceedings of the Human Language Technology Conference and the North American Chapter of the Association for Computational Linguistics Annual Meeting (HLT-NAACL)*, New York, USA, 2006.

- J. Feng, S. Reddy, and M. Saraclar.
WebTalk: Mining Websites for Interactively Answering Questions.
In *Proceedings of the 9th European Conference on Speech Communication and Technology (Inter-speech 2005 - Eurospeech)*, Lisbon, Portugal, 2005.
- M. Collins, B. Roark, and M. Saraclar.
Discriminative Syntactic Language Modeling for Speech Recognition.
In *Proceedings of the 43rd Annual Meeting of the Association for Computational Linguistics*, Ann Arbor, Michigan, USA, 2005.
- M. Saraclar and B. Roark.
Joint discriminative language modeling and utterance classification.
In *Proceedings of the IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, Philadelphia, USA, 2005.
- V. Goffin, C. Allauzen, E. Bocchieri, D. Hakkani-Tür, A. Ljolje, S. Parthasarathy, M. Rahim, G. Riccardi, and M. Saraclar.
The AT&T WATSON Speech Recognizer.
In *Proceedings of the IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, Philadelphia, USA, 2005.
- E. Bocchieri, M. Riley, and M. Saraclar.
Methods for task adaptation of acoustic models with limited transcribed in-domain data.
In *Proceedings of the International Conference on Spoken Language Processing (ICSLP)*, Jeju Island, South Korea, 2004.
- A. Ljolje, V. Goffin, and M. Saraclar.
Low Latency Real-Time Vocal Tract Length Normalization.
In *Proceedings of the 7th International Conference on Text, Speech and Dialogue (TSD)*, Brno, Czech Republic, 2004.
- B. Roark, M. Saraclar, M. Collins, and M. Johnson.
Discriminative language modeling with conditional random fields and the perceptron algorithm.
In *Proceedings of the 42nd Annual Meeting of the Association for Computational Linguistics*, Barcelona, Spain, 2004.
- B. Roark, M. Saraclar, and M. Collins.
Corrective language modeling for large vocabulary ASR with the perceptron algorithm.
In *Proceedings of the IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, Montreal, Canada, 2004.
- A. Yazgan and M. Saraclar.
Hybrid language models for out of vocabulary word detection in large vocabulary conversational speech recognition.
In *Proceedings of the IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, Montreal, Canada, 2004.
- M. Saraclar and R. Sproat.
Lattice-based search for spoken utterance retrieval.
In *Proceedings of the Human Language Technology Conference of the North American Chapter of the Association for Computational Linguistics (HLT-NAACL)*, Boston, USA, 2004.

- M. Bacchiani, B. Roark, and M. Saraclar.
Language model adaptation with MAP estimation and the perceptron algorithm.
In *Proceedings of the Human Language Technology Conference of the North American Chapter of the Association for Computational Linguistics (HLT-NAACL)*, Boston, 2004.
- C. Allauzen, M. Mohri, and M. Saraclar.
General indexation of weighted automata – application to spoken utterance retrieval.
In *Proceedings of the HLT-NAACL Workshop on Interdisciplinary Approaches to Speech Indexing and Retrieval*, Boston, 2004.
- L. Begeja, D. Gibbon, Z. Liu, B. Renger, M. Saraclar, and B. Shahraray.
A system for searching and browsing spoken communications.
In *Proceedings of the HLT-NAACL Workshop on Interdisciplinary Approaches to Speech Indexing and Retrieval*, Boston, 2004.
- M. Saraclar, M. Riley, E. Bocchieri, and V. Goffin.
Towards automatic closed captioning: Low latency real time broadcast news transcription.
In *Proceedings of the International Conference on Spoken Language Processing (ICSLP)*, Denver, Colorado, 2002.
- M. Saraclar and S. Khudanpur.
Pronunciation ambiguity vs pronunciation variability in speech recognition.
In *Proceedings of the IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, Istanbul, Turkey, 2000.
- M. Saraclar, H. Nock, and S. Khudanpur.
Pronunciation modeling by sharing gaussian densities across phonetic models.
In *Proceedings of the European Conference on Speech Communication and Technology (Eurospeech)*, Budapest, Hungary, 1999.
- W. Byrne, M. Finke, S. Khudanpur, J. McDonough, H. Nock, M. Riley, M. Saraclar, C. Wooters, and G. Zavaliagkos.
Pronunciation modelling using a hand-labelled corpus for conversational speech recognition.
In *Proceedings of the IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, Seattle, WA, 1998.
- M. Riley, W. Byrne, M. Finke, S. Khudanpur, A. Ljolje, J. McDonough, H. Nock, M. Saraclar, C. Wooters, and G. Zavaliagkos.
Stochastic pronunciation modeling from hand-labeled phonetic corpora.
In *Proceedings of the Workshop on Modeling Pronunciation Variation for Automatic Speech Recognition*, Rolduc, The Netherlands, 1998.
- W. Byrne, M. Finke, S. Khudanpur, J. McDonough, H. Nock, M. Riley, M. Saraclar, C. Wooters, and G. Zavaliagkos.
Pronunciation modelling for conversational speech recognition: A status report from WS97.
In *Proceedings of the IEEE Automatic Speech Recognition and Understanding Workshop (ASRU)*, Santa Barbara, CA, 1997.
- E. Fosler, M. Weintraub, S. Wegmann, Y.H. Kao, S. Khudanpur, C. Galles, and M. Saraclar.
Automatic learning of word pronunciation from data.
In *Proceedings of the International Conference on Spoken Language Processing (ICSLP)*, Philadelphia, PA, 1996.

- PUBLICATIONS O. Aran, I. Ari, P. Campr, E. Dikici, M. Hruz, D. Kahramaner, S. Parlak, L. Akarun, M. Saraclar.
Workshop Speech and Sliding Text Aided Sign Retrieval from Hearing Impaired Sign News Videos.
Presentations Enterface'07: The SIMILAR NoE Summer Workshop on Multimodal Interfaces, 2007.
and Reports
- Z. Inanoglu, M. Jottrand, M. Markaki, K. Stankovic, A. Zara, L. Arslan, T. Dutoit, I. Panzic, M. Saraclar, Y. Stylianou.
Multimodal Speaker Identity Conversion.
Enterface'07: The SIMILAR NoE Summer Workshop on Multimodal Interfaces, 2007.
- B. Bahar, I.B. Barla, O. Boymul, C. Dicle, B. Erol, M. Saralar, T.M. Sezgin, M. Zelezny.
Mobile-Phone Based Gesture Recognition.
Enterface'07: The SIMILAR NoE Summer Workshop on Multimodal Interfaces, 2007.
- M. Kurimo, M. Creutz, M. Varjokallio, E. Arisoy and M. Saraclar.
Unsupervised segmentation of words into morphemes: An Introduction and Evaluation Report.
PASCAL Challenge Workshop on Unsupervised segmentation of words into morphemes, 2006.
- E. Bocchieri, A. Ljolje, M. Riley, B. Roark, M. Saraclar, and I. Shafran.
The AT&T 1xRT CTS System.
Rich Transcription Workshop, Spring 2003.
- E. Bocchieri, A. Ljolje, M. Riley, and M. Saraclar.
AMTOOLS: Speech Recognition Acoustic Modeling Library.
AT&T Speech Days: A symposium on speech and information processing with the twin themes of speech data mining and speech research software libraries, 2002.
- M. Riley, E. Bocchieri, A. Ljolje, and M. Saraclar.
The AT&T 1x Real-Time Switchboard Speech-to-Text System.
Rich Transcription Workshop, 2002.
- A. Ljolje, M. Saraclar, M. Bacchiani, M. Collins, and B. Roark.
The AT&T RT-02-STT gt10xRT System.
Rich Transcription Workshop, 2002.
- A. Ljolje, M. Saraclar, M. Bacchiani, and M. Riley.
The AT&T LVCSR-2001 System.
NIST Large Vocabulary Conversational Speech Recognition Workshop, 2001.
- M. Saraclar and S. Khudanpur.
Properties of pronunciation change in conversational speech recognition.
Speech Transcription Workshop, 2000.
- W. Byrne, M. Finke, S. Khudanpur, J. McDonough, H. Nock, M. Riley, M. Saraclar, C. Wooters, and G. Zavaliagos.
Pronunciation modelling at WS97.
LVCSR Summer Workshop Technical Reports, CLSP/JHU, Baltimore, MD, 1997.
- M. Saraclar.
Automatic learning of a model for word pronunciations: Status report.
Conversational Speech Recognition Workshop: DARPA Hub-5E Evaluation, Baltimore, MD, 1997.
- M. Weintraub, E. Fosler, C. Galles, Y.H. Kao, S. Khudanpur, M. Saraclar, and S. Wegmann.
WS96 Project Report: Automatic learning of word pronunciation from data.
LVCSR Summer Workshop Technical Reports, CLSP/JHU, Baltimore, MD, 1996.

AWARDS AT&T Labs Research Excellence Award for outstanding contribution to the Switchboard Bake-Off competition, 2002.

GRANTS PI, TUBITAK Career (105E102): Turkish Broadcast News Transcription and Retrieval, 2006-2011.
 Researcher, TUBITAK (107E021): Sign Language Tutor, 2007-2009.
 Researcher, TUBITAK (107E001), COST-2101: Performance and security improvement with multi-biometrics, 2007-2010.
 Researcher, EU IST (FP6-507609), SIMILAR Network of Excellence, 2005-2007.
 PI, Bogazici University Research Fund (05HA202): Automatic Speech Recognition of Turkish Broadcast News, 2005-2007.
 PI, Bogazici University Research Fund (07HA201D): Feature Selection for Turkish Discriminative Language Models, 2007-2008.

SUPERVISORY *PhD Students*
 Ebru Arisoy, Bogazici University EE Dept. (2005-).
 Hasim Sak (Co-advised), Bogazici University CmpE Dept. (2005-).
 Ipek Sen (Co-advised), Bogazici University EE Dept. (2008-).
MS Students
 Dogan Can, Bogazici Univ. EE Dept. (2007-).
 Erinc Dikici, Bogazici Univ. EE Dept. (2007-).
 Tuncay Aksungurlu, Bogazici Univ. EE Dept. (2006-2008).
 Siddika Parlak, Bogazici Univ. EE Dept. (2007-2008).
 C. Kayra Akman, A Computer Aided Transcription Tool, Bogazici Univ. EE Dept. (2005-2007).
 Onur Cengelci (Co-advised), Voice Driven Keyword Spotter, Bogazici Univ. EE Dept. (2005-2006).
Summer Interns
 Co-mentor for Srihari Reddy from Johns Hopkins University, 2004.
 Supervisor and mentor for Ali Yazgan from Johns Hopkins University, 2003.

COURSES TAUGHT **Undergraduate:** Introduction to Electrical Engineering, Numerical Methods for Electrical Engineers, Orientation to Electrical Engineering.
Graduate: Advanced Speech Processing, Automatic Speech Recognition, Machine Learning for Signal Processing, Multiresolution Signal Processing, Pattern Recognition, Speech Processing, Statistical Natural Language Processing.

PROFESSIONAL ACTIVITIES *Elected Member*
 IEEE Signal Processing Society Speech and Language Technical Committee (2007-2009).
 IEEE Turkish Branch Executive Committee – Technical Activities (2008-).
Area Chair
 IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP 2008, 2009)
 Human Language Technology Conference
 Conference on Empirical Methods in Natural Language Processing (HLT/EMNLP 2005)

Reviewer

Computer Speech and Language

Speech Communication

IEEE Transactions on Speech and Audio Processing

Pattern Recognition Letters