

Doğın Can

Behavioral Signal Technologies Inc.
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EDUCATION ♦ **University of Southern California**, Los Angeles, CA.

Ph.D. in Computer Science

August 2010 - May 2018

- Track : Natural Language Processing, Advisor: Shrikanth S. Narayanan
- GPA : 4.00/4.00
- Courses: Empirical Natural Language Processing, Statistical Machine Translation, Artificial Intelligence, Advanced Analysis of Algorithms, Convex Optimization

♦ **Boğaziçi University**, İstanbul, Turkey

M.Sc. in Electrical Engineering

September 2007 - February 2010

- Option : Telecommunications and Signal Processing
- GPA : 4.00/4.00
- Thesis : Indexing, Retrieval and Detection Techniques for Spoken Term Detection, Advisor: Murat Saraçlar
- Courses: Mathematical Methods for Signal Processing, Spectral Estimation, Advanced Speech Processing, Artificial Neural Networks

B.Sc. (Honors) in Electrical Engineering

September 2002 - May 2006

- Option : Telecommunications and Signal Processing
- GPA : 3.72/4.00
- Courses: Speech Processing, Natural Language Processing

♦ **Rensselaer Polytechnic Institute**, Troy, NY.

Coursework in Electrical Engineering

August 2006 - August 2007

- GPA : 3.84/4.00
- Courses: Random Processes, Detection and Estimation Theory, Information Theory, Pattern Recognition, Digital Image and Video Processing

♦ **Scholarships**

- USC Annenberg Graduate Fellowship (August 2010)
- M.Sc. Scholarship from Scientific & Technological Research Council of Turkey (September 2007)
- Boğaziçi University Outstanding Academic Merit Scholarship (September 2005)

RESEARCH INTERESTS

Machine Learning, Automatic Speech Recognition, Statistical Natural Language Processing, Statistical and Information Theoretic Methods in Learning, Spoken Information Retrieval, Weighted Finite State Transducers, Spoken Dialogue Modeling

EXPERIENCE ◇ **Senior Machine Learning Engineer**

Behavioral Signals May 2018 - Present

- design and implementation of state-of-the-art speech recognition pipeline used at production

◇ **Research Assistant**

Signal Analysis and Interpretation Lab (SAIL), USC August 2010 - May 2018

- Project : PyKaldi
 - design and implementation of a Python Wrapper for Kaldi (built with CLIF)
- Project : DARPA LORELEI Program
 - research on multi-task learning of multilingual distributed text representations
- Project : iARPA BABEL Program
 - research on weighted finite-state transducer based lattice indexing, retrieval and ranking
 - research on end-to-end deep learning for spoken content retrieval
 - design and implementation of the Keyword Search (KWS) tools used in the project (built in C++ using OpenFst Library)
- Project : NIAAA Automating Behavioral Coding
 - research on modeling the dialogue in psychotherapy sessions and automatic prediction of behavioral codes
 - design and implementation of data annotation guidelines and tools for the consolidation and normalization of various datasets used by the research team
- Project : Barista
 - design and implementation of an online speech processing framework based on Kaldi (built in C++ using the actor model)

◇ **Research Intern**

IBM Research June 2013 - August 2013

- Project : Automatic Assessment of Language Learners' English Skills

◇ **Research Assistant**

Signal and Image Processing Lab, Boğaziçi University September 2007 - July 2010

- Project : Turkish Broadcast News Transcription and Retrieval
 - design and implementation of the Spoken Term Detection (STD) tools used in the project (built in C++ using OpenFst Library)
 - development of the LVCSR systems used in the project (AT&T amtools, IBM Attila, HTK)

◇ **Researcher**

CLSP Summer Workshop on Human Language Technology July 2008 - August 2008

- Group : Multilingual Spoken Term Detection: Finding and Testing New Pronunciations
 - implementation of the STD system (C++, OpenFst) used throughout the workshop

◇ **Teaching Assistant**

ECSE Dept, Rensselaer Polytechnic Institute August 2006 - May 2007

- Courses : Sensing and Imaging, Probability for Engineering Applications, Laboratory Introduction to Embedded Control

- SKILLS**
- ◇ Languages: English (fluent), Turkish (native)
 - ◇ OS: Unix/Linux, Mac, Windows
 - ◇ Programming Languages: C/C++, Python, Perl, bash, MATLAB, L^AT_EX, HTML/JavaScript, Ruby, Julia, Rust, Swift
 - ◇ Machine Learning: Torch, Tensorflow, Theano, Keras, Blocks, libSVM, Weka, scikit-learn
 - ◇ Speech: Kaldi, IBM Attila, AT&T LVR (FSM, GRM, AMTOOLS, DCD), HTK, SRILM
 - ◇ NLP: OpenFst, NLTK, spaCy, Moses, CoreNLP, CRFsuite, Wapiti
- PUBLICATIONS**
- Journal Articles**
- N. Malandrakis, A. Ramakrishna, V. Martinez, T. Sorensen, **D. Can**, and S. S. Narayanan
 “The ELISA Situation Frame extraction for low resource languages pipeline for LoReHLT’2016.”
 In *Machine Translation*, 32(1-2), 127-142, 2018
- D. Can**, R. Marin, P. G. Georgiou, Z. Imel, D. C. Atkins, S. S. Narayanan
 ““It sounds like...”: A natural language processing approach to detecting counselor reflections in motivational interviewing.”
 In *Journal of counseling psychology*, 2016
- S. P. Lord **D. Can**, M. Yi, R. Marin, C. W. Dunn, Z. Imel, P. G. Georgiou, S. S. Narayanan, M. Steyvers and D. C. Atkins
 “Advancing methods for reliably assessing motivational interviewing fidelity using the motivational interviewing skills code”
 In *Journal of substance abuse treatment*, 2015
- D. Can** and M. Saraçlar
 “Lattice Indexing for Spoken Term Detection”
IEEE Transactions on Audio, Speech and Language Processing, 19(8):2338-2347, November 2011
- E. Arısoy, **D. Can**, S. Parlak, H. Sak and M. Saraçlar
 “Turkish Broadcast News Transcription and Retrieval”
IEEE Transactions on Audio, Speech and Language Processing, 17(5):874-883, July 2009
- Peer-Reviewed Conference Papers**
- D. Can**, V. R. Martinez, P. Papadopoulos and S. S. Narayanan
 “Pykaldi: A Python Wrapper for Kaldi”
 In *Proceedings of ICASSP*, 2018
- K. Singla, **D. Can** and S. S. Narayanan
 “A Multi-task Approach to Learning Multilingual Representations”
 In *Proceedings of ACL*, 2018
- K. Singla, Z. Chen, N. Flemotomos, J. Gibson, **D. Can**, D. C. Atkins and S. S. Narayanan
 “Using Prosodic and Lexical Information for Learning Utterance-level Behaviors in Psychotherapy.”
 In *Proceedings of Interspeech*, 2018
- J. Gibson, **D. Can**, P. Georgiou, D. C. Atkins and S. S. Narayanan
 “Attention networks for modeling behaviors in addiction counseling.”
 In *Proceedings of Interspeech*, 2017
- D. Bone, J. Gibson, T. Chaspari, **D. Can** and S. S. Narayanan
 “Speech and language processing for mental health research and care”
 In *Signals, Systems and Computers*, 2016 50th Asilomar Conference on (pp. 831-835). IEEE.
- J. Gibson, **D. Can**, B. Xiao, Z. Imel, D. C. Atkins, P. Georgiou and S. S. Narayanan
 “A Deep Learning Approach to Modeling Empathy in Addiction Counseling”
 In *Proceedings of ISCA Interspeech*, 2016

- B. Xiao, **D. Can**, J. Gibson, Z. Imel, D. C. Atkins, P. Georgiou and S. S. Narayanan
“Behavioral Coding of Therapist Language in Addiction Counseling using Recurrent Neural Networks”
In *Proceedings of ISCA Interspeech*, 2016
- D. Can** and S. S. Narayanan
“A Dynamic Programming Algorithm for Computing N-gram Posteriors from Lattices”
In *Proceedings of EMNLP*, 2015
- D. Can**, D. C. Atkins and S. S. Narayanan
“A dialog act tagging approach to behavioral coding: A case study of addiction counseling conversations”
In *Proceedings of ISCA Interspeech*, 2015
- D. Can**, J. Gibson, C. Vaz, P. G. Georgiou and S. S. Narayanan
“Barista: A framework for concurrent speech processing by USC-SAIL”
In *Proceedings of ICASSP*, 2014
- D. Can** and S. S. Narayanan
“On the computation of document frequency statistics from spoken corpora using factor automata”
In *Proceedings of InterSpeech*, 2013
- F. Morbini, K. Audhkhasi, K. Sagae, R. Artstein, **D. Can**, P. Georgiou, S. Narayanan, A. Leuski, D. Traum
“Which ASR should I choose for my dialogue system.”
In *Proceedings of SIGdial*, 2013
- D. Can**, P. G. Georgiou, D. C. Atkins and S. S. Narayanan
“A Case Study: Detecting Counselor Reflections in Psychotherapy for Addictions using Linguistic Features”
In *Proceedings of ISCA Interspeech*, 2012
- B. Xiao, **D. Can**, P. G. Georgiou, D. C. Atkins and S. S. Narayanan
“Analyzing the Language of Therapist Empathy in Motivational Interview based Psychotherapy”
In *Proceedings of APSIPA Annual Summit and Conference*, 2012
- H. Wang, **D. Can**, A. Kazemzadeh, F. Bar and S. Narayanan
“A System for Real-Time Twitter Sentiment Analysis of 2012 U.S. Presidential Election Cycle”
In *Proceedings of ACL*, 2012
- O. Çakmak, A. Kazemzadeh, **D. Can**, S. Yıldırım and S. Narayanan
“Root-Word Analysis of Turkish Emotional Language”
Emotion Sentiment and Social Signals - ES³ 2012
- D. Can**, E. Cooper, A. Ghoshal, M. Jansche, S. Khudanpur, B. Ramabhadran, M. Riley, M. Saraçlar, A. Sethy, M. Ulinski, C. White
“Web derived Pronunciations for Spoken Term Detection”
In *Proceedings of ACM-SIGIR*, 2009
- D. Can** and M. Saraçlar
“Score Distribution Based Term Specific Thresholding for Spoken Term Detection”
In *Proceedings of NAACL-HLT*, 2009
- D. Can**, E. Cooper, A. Sethy, C. M. White, B. Ramabhadran and M. Saraçlar
“Effect of Pronunciations on OOV Queries in Spoken Term Detection”
In *Proceedings of IEEE ICASSP*, 2009
- T. Som, **D. Can**, and M. Saraçlar
“HMM-based Sliding Video Text Recognition for Turkish Broadcast News”
In *Proceedings of IEEE ISCIS*, September 2009.

D. Can and M. Saraçlar

“Turkish Broadcast News Transcription with Open-Source Software”

In *Proceedings of IEEE Signal Processing and Communications Applications Conference*,
2009 (in Turkish)