

JOSH MEYER

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I'm a PhD candidate passionate about Machine Learning and open-source language technologies. My educational background is in Computational Linguistics, Theoretical Linguistics, Natural Language Processing, Statistics, and Cognitive Science. My PhD thesis focuses on Speech Technology, and Automatic Speech Recognition in particular. I work to develop approaches for training more robust Deep Neural Networks for Speech Recognition, using Multi-Task Learning and Transfer Learning. My research is linguistically informed, but based in Machine Learning methods.

Currently based in San Francisco.

EDUCATION

University of Arizona

Ph.D. in Linguistics (focus: *Computational Linguistics*)

Thesis Title: *Multi-Task Learning in Low-Resource Speech Recognition*

Expected 2019

Tucson, AZ

University of Arizona

M.A. in Linguistics

May 2015

Tucson, AZ

Seton Hall University

B.A. in Liberal Studies

May 2012

South Orange, NJ

INDUSTRY EXPERIENCE

Mozilla (Machine Learning Research Group)

NSF-Sponsored Internship

Developing end-to-end multilingual Automatic Speech Recognition techniques based on Transfer Learning and Deep Neural Networks (i.e. DeepSpeech).

October 2018 — Present

Various Companies

Kaldi & ASR Consultant

Optimized Automatic Speech Recognition pipelines for various companies using the Kaldi toolkit.

2016 — 2018

TECHNICAL STRENGTHS

Computer Languages

Python, Bash, MATLAB, Perl, R, C++ (*some knowledge*)

Other

TensorFlow, Kaldi, virtualenv, scikit-learn, pandas, nltk, matplotlib, kenlm, Linux, AWS, git, GitHub

OPEN SOURCE WORK

Mozilla DeepSpeech	<i>Added Transfer Learning branch</i>	[Code]
Multi-Task Kaldi	<i>Multi-Task Acoustic Modeling with Neural Networks</i>	[Code]
NVDA	<i>Added Kyrgyz language to screen reader</i>	[Code]
eSpeak NG	<i>Added Kyrgyz language to speech synthesizer</i>	[Code]
Autotrace	<i>Created visualization tools for ultrasonic imaging</i>	[Code]

RESEARCH EXPERIENCE

National Science Foundation	July 2015 — Present
<i>Graduate Research Fellow</i>	
Conducting PhD thesis research on Multi-Task Learning and Deep Learning techniques for Automatic Speech Recognition in low-resource data scenarios.	
CNRS-LIMSI	July 2016 — July 2017
<i>Chateaubriand Research Fellow</i>	<i>Orsay, France</i>
Conducted research on Neural Network Acoustic Model adaptation, and Recurrent Neural text augmentation techniques for language modeling in Speech Recognition.	
American University of Central Asia	June 2015 — August 2015
<i>Visiting Research Scholar</i>	<i>Bishkek, Kyrgyzstan</i>
Created a spoken corpus of conversational speech for the Kyrgyz language.	
Arizona Phonological Imaging Lab	Spring 2015
<i>Research Assistant</i>	<i>Tucson, AZ</i>
Developed software to visualize and statistically analyze ultrasonic images of tongue contours for articulatory-phonetics research.	
American University of Central Asia	August 2013 — March 2014
<i>Visiting Research Fellow</i>	<i>Bishkek, Kyrgyzstan</i>
Conducted acoustic-phonetic and phonological research on the Kyrgyz language, using paradigms from Cognitive Science.	
Language Acquisition Research Center at Hunter CUNY	November 2011 — August 2012
<i>Research Assistant</i>	<i>New York, NY</i>
Designed text corpus-based research, transcribed spontaneous child speech, and designed the laboratory's website.	
KIT/NYU MEG Lab at NYU	May 2012 — August 2012
<i>Research Assistant</i>	<i>New York, NY</i>
Aided in analysis and processing of Magnetoencephalography (MEG) brain imaging data from cognitive science research.	

Language Acquisition and Neurolinguistics Lab at Rutgers
Research Assistant

May 2012 - August 2012
New Brunswick, NJ

Aided in experimental design of Neurolinguistic research studies.

GRANTS & AWARDS

Graduate Research Fellowship 2015-2019
Approx. \$102,000 + \$36,000 (tuition) *National Science Foundation*

NSF INTERN Grant 2018
Approx. \$50,000 *National Science Foundation*

Chateaubriand STEM Fellowship 2016
 €5,000 *French Embassy to the United States of America*

GROW Travel Award 2016
 \$5,000 *National Science Foundation*

Visiting Research Fellowship August 2013 — March 2014
 \$5,000 *American University of Central Asia*

Regents Scholarship August 2008 — May 2012
 \$111,140 (tuition) *Seton Hall University*

PUBLICATIONS

(2018) Meyer, Joshua. **Unsupervised Task Discovery for Multi-Task Acoustic Modeling.** Proceedings of the Machine Learning in Speech and Language Processing Workshop. [Poster] [Paper]

(2018) Meyer, Joshua, and Kloehn, Nick, and Carnie, Andrew. **The Field is not the Lab, and the Lab is not the Field: Experimental linguistics and endangered language communities.** *Insights from Practices in Community-Based Research: From Theory To Practice Around The Globe*, ISBN: 978-3-11-052701-8 Edited by Shannon Bischoff and Carmen Jany. *Mouton De Gruyter*

(2018) Bekmurzaev, Nurbek, and Lottholz, Philipp, and Meyer, Joshua. **Navigating the safety implications of doing research and being researched in Kyrgyzstan: cooperation, networks and framing.** *Central Asian Survey*, 37:1, 100-118, DOI: 10.1080/02634937.2017.1419165

(2017) Meyer, Joshua. **Development of a Kyrgyz Speech Synthesizer: A Demonstration of the Ossian Frontend and Merlin Neural Network Speech Synthesis Toolkit.** *Proceedings of The 5th International Conference on Computer Processing of Turkic Languages*, Vol. 1, 130-136.

(2016) Lottholz, Philipp, and Meyer, Joshua. **Friend or Foreign Agent? On the Limits of Field Research in Post-Soviet Kyrgyzstan.** *Exeter Central Asian Studies Network*.

(2016) Meyer, Joshua. **Conducting Linguistic Fieldwork in Kyrgyzstan.** *Arizona Anthropologist*, Vol. 27.

PRESENTATIONS

Language Technologies in Central Asia: A Survey. Joint ESCAS-CESS Conference at the American University of Central Asia. *2017, Bishkek*

Predicting Language Dominance in Kyrgyz-Russian Bilinguals. w/ Quam, Carolyn Arizona Linguistics Circle 9. *2015, Tucson*

Phonological processing in Kyrgyz-Russian bilinguals. w/ Quam, Carolyn, and Bever, Thomas The Miniconference on Metrical Structure: Acquisition and processing. *2014, Utrecht*

The Kyrgyzstan corpus project: Building a language resource unique to Kyrgyzstan and available to all. CASI Public Seminar at the American University of Central Asia. *2014, Bishkek*

Now you hear it, now you dont: Phonological processing in Kyrgyz-Russian bilinguals. CASI Public Seminar at the American University of Central Asia. *2013, Bishkek*

Psycholinguistics: Thinking about language differently. Lecture conducted at The Plattform at Werkstatttraum. *2013, Berlin*

EVENT ORGANIZATION

Kyrgyz Voice Technology Hackathon Attended by undergraduate students as well as professional developers. *(2019, American University of Central Asia)* [\[Link\]](#)

DeepSpeech & Common Voice Tutorial Delivered to attendees of the Fifth International Workshop on Computational Linguistics for Uralic Languages. *(2019, University of Tartu)* [\[Link\]](#)

Speech Synthesis Workshop: Hands-on with Merlin & Ossian Delivered to Computational Linguistics Faculty and Graduate Students. *(2018, Higher School of Economics)* [\[Link\]](#)

Speech Recognition Workshop: Hands-on with Kaldi & DeepSpeech Delivered to Computational Linguistics Faculty and Graduate Students. *(2017, Higher School of Economics)* [\[Link\]](#)

WRITTEN TUTORIALS

How to Train *practically* any Model from *practically* any Data with TensorFlow [\[Link\]](#)

Getting started with the Merlin Speech Synthesis Toolkit [\[Link\]](#)

How to Train a Deep Neural Net Acoustic Model with Kaldi [\[Link\]](#)

How to add a new language to the eSpeak NG Speech Synthesizer [\[Link\]](#)

The Flow of TensorFlow: An Email Classification Tutorial [\[Link\]](#)

An Introduction to CMU-Sphinx Speech Recognition Toolkit: First Steps [\[Link\]](#)