Haoqi Li

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PROFILE

I'm an applied scientist at Amazon AWS AI. Before that, I obtained Ph.D. in Electrical Engineering at University of Southern California advised by Prof. Shrikanth Narayanan and Panayiotis Georgiou.

My research focuses machine/deep learning on human speech related areas, including speech signal processing, speech recognition, speaker recognition, affective computing, and natural language processing.

EDUCATION

University of Southern California, Los Angeles, USA

Ph.D. in Electrical Engineering — Aug. 2014 - Nov. 2020

Dissertation: "Behavior understanding from speech under constrained conditions: exploring sparse networks, transfer and unsupervised learning"

Advisors: Shrikanth Narayanan and Panayiotis Georgiou

M.S. in Computer Science — Aug. 2017 - May 2018

Chinese Academy of Sciences, Beijing, China

M.S. in Signal and Information Processing — Aug. 2011 - Jun. 2014

Xidian University, Xi'an, China

B.S. in Electronic Information Engineering — Aug. 2007 - Jun. 2011

Overall GPA: 91.3/100 (Rank 1/220)

EXPERIENCE

Amazon AWS AI Lab — Jan. 2021 - Present

Applied Scientist — *New York, NY, USA*

Building AI-enabled cloud services driven by large-scale machine learning and natural language understanding.

University of Southern California, SAIL — Aug. 2014 - Nov. 2020

Research Assistant — *Los Angeles, CA, USA*

Worked on deep learning techniques for modeling human behaviors from speech and language to improve well-being and identify psychological disorders. Investigated **sparse networks**, **transfer learning** and **unsupervised learning** under constrained **low-resource** data conditions. My representative works are:

- Linking emotions to behaviors: A novel framework that investigates the inferential capacity and contextual importance between emotions and behaviors via deep transfer learning.
- Beh2Vec: A novel model that focuses on unsupervised speech representation learning for behavior modeling using triplet enhanced contextualized networks.
- SD-DNN: Sparsely connected and disjointly trained deep neural networks for low resource behavioral annotation.

Amazon Lab126 — May. 2020 - Aug. 2020

Applied Scientist Intern — *Sunnyvale, CA, USA*

Designed a **domain-adaptation** multimodality emotion recognition model on audio-visual data for human-robot interaction purpose.

- Explored domain transfer learning techniques on emotional utterances collected under different emotion elicitation approaches, particularly with limited labeled target samples.

JD AI Research - JD.com May. 2018 - Aug. 2018
Research Intern *Mountain View, CA, USA*

Worked on voice conversion, end-to-end Text-to-Speech (TTS) and **speaker-invariant emotion representation learning**.

- Implemented and optimized **Chinese Text-to-Speech** systems based on Voiceloop.
- Designed the neural network for extracting speaker-invariant emotion representations from speech via **adversarial training**.
- Technical paper was presented at ICASSP 2020.

SONY Playstation Acoustic Analysis Group May. 2018 - Aug. 2018
Research Intern *San Mateo, CA, USA*

Worked on the prediction of funny movie scenes.

- Designed a **reinforcement learning framework** for affective detection from movie footage
- Technical paper was presented at ICASSP 2018.

PUBLICATIONS

Journal Publications:

[1] **Haoqi Li**, Brian Baucom, Panayiotis Georgiou. "Linking emotions to behaviors through deep transfer learning."PeerJ Computer Science 6:e246, 2020.

[2] **Haoqi Li**, Brian Baucom, Shrikanth Narayanan, Panayiotis Georgiou."Unsupervised Speech Representation Learning for Behavior Modeling using Triplet Enhanced Contextualized Networks." submitted to Computer Speech and Language.

[3] Prashanth Gurunath Shivakumar, **Haoqi Li**, Kevin Knight, and Panayiotis Georgiou. "Learning from Past Mistakes: Improving Automatic Speech Recognition Output via Noisy-Clean Phrase Context Modeling." APSIPA Transactions on Signal and Information Processing Vol.8 2019.

Conference Publications:

[1] **Haoqi Li**, Yelin Kim, Cheng-Hao Kuo, Shrikanth Narayanan. "Acted vs. Improvised: Domain Adaptation for Elicitation Approaches in Audio-Visual Emotion Recognition." Submitted to Interspeech 2021.

[2] **Haoqi Li**, Ming Tu, Jing Huang, Shrikanth Narayanan, Panayiotis Georgiou. "Speaker-invariant Affective Representation Learning via Adversarial Training." ICASSP, 2020.

[3] Sandeep Nallan Chakravarthula, Md Nasir, Shao-Yen Tseng, **Haoqi Li**, Tae Jin Park, Brian Baucom, Craig J Bryan, Shrikanth Narayanan, Panayiotis Georgiou. "Automatic prediction of suicidal risk in military couples using multimodal interaction cues from couples conversations." ICASSP, 2020.

[4] Raghuveer Peri, **Haoqi Li**, Krishna Somandepalli, Arindam Jati, Shrikanth Narayanan. "An Empirical Analysis of Information Encoded in Disentangled Neural Speaker Representations." Odyssey: The Speaker and Language Recognition Workshop, 2020.

[5] **Haoqi Li***, Sandeep Nallan Chakravarthula*, Shao-Yen Tseng, Maija Reblin, Panayiotis Georgiou (*Equal Contribution). "Predicting Behavior in Cancer-Afflicted Patient and Spouse Interactions using Speech and Language." Interspeech, 2019.

[6] **Haoqi Li***, Shao-Yeng Tseng*, Brian Baucom, and Panayiotis Georgiou (*Equal Contribution). "Honey, I Learned to Talk": Multimodal Fusion for Behavior Analysis. In Proceedings of the 20th ACM International Conference on Multimodal Interaction (ICMI), 2018.

[7] **Haoqi Li**, Naveen Kumar, Ruxin Chen, Panayiotis Georgiou. "A Deep Reinforcement Learning Framework for Identifying Funny Scenes in Movies." ICASSP, Calgary, Alberta, Canada, 2018.

[8] **Haoqi Li**, Brian Baucom, Panayiotis Georgiou. "Unsupervised Latent Behavior Manifold Learning from Acoustic Features: audio2behavior." ICASSP, New Orleans, LA, USA, 2017.

[9] **Haoqi Li**, Brian Baucom, Panayiotis Georgiou. "Sparsely Connected and Disjointly Trained Deep Neural Networks for Low Resource Behavioral Annotation: Acoustic Classification in Couples' Therapy." Interspeech, San Francisco, CA, USA, 2016.

[10] Xin Liu, **Haoqi Li**, Haibin Wang. "Probability Constrained Robust Multicast Beamforming in Cognitive Radio Network." International Conference on Communications and Networking in China (ChinaCom), Guilin, China, 2013. (**Best Student Paper Award**)

PATENTS

[1] Ruxin Chen, Naveen Kumar, **Haoqi Li**. "Deep reinforcement learning framework for characterizing video content." U.S. Patent granted US10885341B2, 2021.

TEACHING EXPERIENCE

Teaching Assistant, University of Southern California Fall 2019

EE 660 Machine Learning from Signals: Foundations and Methods
Instructed by Prof. Keith Jenkins

Teaching Assistant, University of Southern California Spring 2018

EE 503 Probability for Electrical and Computer Engineers
Instructed by Prof. Vijay Kumar

ACADEMIC SERVICE

Reviewer

ICASSP 2020
IEEE Transactions on Affective Computing
IEEE Transactions on Multimedia
IEEE Signal Processing Letters
IEEE Access
Computer Speech and Language
APSIPA Transactions on Signal and Information Processing
EURASIP Journal on Audio, Speech, and Music Processing

HONORS AND AWARDS

ICASSP 2020 Student Travel Grant IEEE SPS, 2020
National Scholarship for Graduate Students Ministry of Education of China, 2013
Merit Student of University of Chinese Academy of Sciences 2012
Outstanding Graduate in Shaanxi Province 2011
Outstanding Graduate of Xidian University 2011
National Scholarship of China (Top 1%) Ministry of Education of China, 2009
Undergraduate Mathematical Contest in Modeling(CUMCM), 1st Prize in Shaanxi Province 2009
Outstanding Students Scholarship of Xidian University 2009-2011
Scholarship of China Aerospace Science & Technology Corp. 2010
Excellent Freshman Scholarship of Xidian University 2008

TECHNICAL SKILLS

Programming Languages	Python, Matlab, Java, C++, Bash Scripting, HTML/CSS, JavaScript
Tools	PyTorch, Kaldi, Linux, AWS, Git, Docker, openSMILE