Juncheng (Billy) Li

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https://scholar.goo-gle.com/citations?hl=en&us-er=fBnAdIkAAAAJ

ABOUT ME

"With multi-disciplinary knowledge background and a clear focus on robust deep learning in multi-modal machine learning, I have prepared myself to delve into more challenging research problems, solve them and create something of value to the real-world!"

RESEARCH INTEREST

Robust Deep Learning
Multimodal Machine Learning
Natural language Process-ing
Audio / Speech Processing

Reviewer

ICML 20/21, NeurIPS 20/21,
ICLR 2022, AAAI 20/21,
CVPR 20/21, ACL 21
IEEE TALLIP, IEEE TNNLS

Teaching

11-751 Speech Recognition;
15-640 Distributed Stystem

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WORK EXPERIENCE

◆ **Deep Learning Research Engineer**
Bosch Center for Artificial Intelligence
Jul 2018 - Sept 2019 | Pittsburgh, PA

- Applied robust machine learning algorithms to Bosch Autonomous driving project, improved system robustness by 50% in bad weather condition.
- Explored mulimodality embeddings to make use of multi-sensor input, trans-ferred the technology to Bosch business team.
- Developed occupancy detection solution using RGB-D sensor, and facilitated the tranfer of technology to business unit.
- Applied representation learning to Bosch drier, improved energy efficiency by 5%.
- Generated 2 patents and top-tier AI conference publications.
- Mentored 2 interns and hired members for the new team.

◆ **Research Engineer**
Bosch Research and Technology Center

Apr 2015 - June 2018 | Pittsburgh, PA

- Designed, Developed, and tested a 3D visualization platform based on BIM (Building Information Model) for Smart Campus sensor network (MQTT protocol) using Java at backend and Javascript at frontend.
- Collaborated closely with Bosch Next App development team, developed VR indoor navigation solution, and deployed the Bosch Next APP on App Store.
- Applied sound recognition to manufactoring production line to detect potential anomaly thus reducing the overall downtime by 10%.
- Applied sound recognition to detect leak in water pipelines, generated 1 patent.

◆ **Data Analysis Research Intern**
Pittsburgh Port Authority

May 2014 - Sep 2014 | Pittsburgh, PA

Created a backend database for Pittsburgh transportation dataset and conducted performance analysis based on the data for 2013, 2014 using Python and Django. BusLine 61 A,B,C,D efficiency raised by 5%

EDUCATION

◆ **PHD Candidate (Language Technology Institute)**
School of Computer Science, Carnegie Mellon University | GPA: 3.8/4.00

2017 - Present (expected 2022) | Pittsburgh, PA

◆ **Dual Degree Master of Science (Advanced Infrastructure System + Engineering Technology Innovation & Management)**
Carnegie Mellon University

2012 - 2015 | Pittsburgh, PA

◆ **Bachelor of Science in Structural Engineering**
Tongji University

2008 - 2012 | Shanghai, China

◆ **Exchange Student in Civil Engineering**
National Chengkung University

2012 | Tainan, Taiwan

NLP & Deep Learning
Neural Networks for NLP
Neural Machine Translation
Deep Reinforcement Learning
Speech Recognition
Algorithm for NLP
Large Scale MultiMedia Analysis
Machine Learning
Statistical Machine Learning

Programming
Distributed System
Software Engineering
Algorithm Design and Analysis
Computer Networks
Parallel and Sequential Data Structures and Algorithms
Introductory to Computer System(C) # Machine Learning
Principles of O-O Programming
Data Mining
Rapid Prototyping(JAVA)
Numerical Methods
Data acquisition
Data Management.

PROGRAMMING SKILLS

Java	◆◆◆◆◆
Python	◆◆◆◆◆
C / C++	◆◆◆◆◆
JS/ HTML / CSS	◆◆◆◆◇
Swift	◆◆◆◇◇
MatLab	◆◆◆◇◇

LANGUAGE SKILLS

Chinese	◆◆◆◆◆
English	◆◆◆◆◆
Japanese	◆◆◆◆◇
German	◆◇◇◇◇

PUBLICATIONS (citations: 867 h-index: 13)

◆ **Very Deep Convolutional Neural Networks for Raw Waveforms**
IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP) 2017, New Orleans, USA
Wei Dai, Chia Dai, Shuhui Qu, **Juncheng Billy Li**, Samarjit Das

◆ **A Comparison of Deep Learning Methods for Environmental Sound Detection**
IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP) 2017, New Orleans, USA
Juncheng Billy Li, Wei Dai, Florian Metze, Shuhui Qu, Samarjit Das

◆ **Real-Time Fine Grained Occupancy Estimation using Depth Sensors on ARM Embedded Platforms**
IEEE Real-Time and Embedded Technology and Applications Symposium 2017, Pittsburgh, USA
Sirajum Munir, Ripudaman Singh Arora, Craig Hesling, **Juncheng Billy Li**, Jonathan Francis, Charles Shelton, Christopher Martin, Anthony Rowe, Mario Berges

◆ **Learning Joint Embedding of Video and Text for Cross-Modal Retrieval**
International Conference on Multimedia Retrieval **(ICMR) 2018**, Yokohama, Japan **(BEST PAPER AWARD)**
Niluthpol Mithun, **Juncheng Li**, Amit Roy-Chowdhury, Florian Metze

◆ **Towards Zero-shot Learning for Automatic Phonemic Transcription**
AAAI Conference on Artificial Intelligence 2020 (acceptance rate: 20.6%) , New York
Xinjian Li, Siddharth Dalmia, David R Mortensen, **Juncheng Li**, Alan W Black, Florian Metze

◆ **A comparison of five multiple instance learning pooling functions for sound event detection with weak labeling**
IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP) 2019, Brighton, UK
Yun Wang, **Juncheng Li**, Florian Metze

◆ **Multiple Instance Deep Learning for Weakly Supervised Small-Footprint Audio Event Detection**
Annual Conference of the International Speech Communication Association 2018, India
Shaoyen Tseng, **Juncheng Billy Li,** Florian Metze, Joseph Szurley, Samarjit Das

◆ **Comparing The Max And Noisy-Or Pooling Functions in Multiple Instance Learning For Weakly Supervised Sequence Learning Tasks**
Annual Conference of the International Speech Communication Association 2018, India
Yun Wang, **Juncheng Li**, Florian Metze

◆ **CMU-UCR-BOSCH @ TRECVID 2017: Video to Text Retrieval**
NIST TRECVID Video Retrieval Workshop 2017, National Institute of Standards and Technology
Juncheng Li, Niluthpol C. Mithun, Amit K. Roy-Chowdhury, Samarjit Das, Florian Metze

◆ **Joint embeddings with multimodal cues for video-text retrieval**
International Journal of Multimedia Information Retrieval 2019, Vol 8, Page 3-18
Niluthpol Mithun, **Juncheng Li**, Amit Roy-Chowdhury, Florian Metze

◆ **A Light-weight Multimodal Framework For Improved Environmental Audio Tagging**
IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP) 2018, Calgary, Canada
Juncheng Li, Yun Wang, Joseph Szurley, Florian Metze, Samarjit Das

◆ **Adversarial camera stickers: A physical camera-based attack on deep learning systems**
International Conference on Machine Learning **(ICML) 2019 (acceptance rate 21.8%)**, Long Beach, USA
Juncheng B Li, Frank R Schmidt, J Zico Kolter

◆ **Universal phone recognition with a multilingual allophone system**
IEEE International Conference on Acoustics, Speech and Signal Processing 2020, Online
Xinjian Li, Siddharth Dalmia, **Juncheng Li**, ..., Graham Neubig, Alan W Black, Florian Metze

◆ **Music Theory Inspired Policy Gradient Method for Piano Music Transcription**
Neural Information Process System 2018 Workshop on creativity AI, Montreal, Canada
Juncheng Li, Shuhui Qu, Yun Wang, Xinjian Li, Samarjit Das, Florian Metze

◆ **Adversarial Music: Real world Audio Adversary against Wake-word Detection System**
Neural Information Process Sysem **(NeurIPS 2019)** , Vancouver, Canada **(SpotLight, top 2.4%)**
Juncheng Li, Shuhui Qu, Xinjian Li, Joseph Szurley, Zico Kolter, Florian Metze