JOSEPH ZHU

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EDUCATION

University of Illinois at Urbana-Champaign **Aug 2018 - Dec 2020**
B.S. Electrical Engineering *GPA 3.98*

- **Courses:** Senior Thesis, Semiconductor Devices, Advanced Engineering Mathematics, Multimedia Signal Processing, Neural Circuits and Systems, Electronic Circuits, Digital System Laboratories, Fields & Waves, Data Structures, Electronic Music Synthesis
- **Focus:** Speech Technology, Signal Processing
- **Scholarships:** Intel SRC Grant, ISUR Grant, UIUC ECE Departmental Scholarship

TECHNICAL SKILLS

- Python, C++, Java, Matlab, Tensorflow, Keras, Pytorch, Algorithm, Data Structure
- In-depth understanding of neural circuits, dynamic fields, signal processing, and audio separation & synthesis

PUBLICATIONS

1. Zhu, Junzhe, M. Hasegawa-Johnson and Leda Sari. "Identify Speakers in Cocktail Parties with End-to-End Attention." INTERSPEECH (2020).
2. Zhu, Junzhe, R. Yeh and M. Hasegawa-Johnson. "Multi-Decoder DPRNN: High Accuracy Source Counting and Separation." submitted to ICASSP(2021).
3. Zhu, Junzhe, M. Hasegawa-Johnson and Nancy McElwain. "A Comparison Study on Infant-Parent Voice Diarization." submitted to ICASSP(2021).
4. Zhu, Junzhe, John Gallagher and Elizabeth Wickes. "Designing Comment Sections by Weighted Topic Rather than Time or Popularity: Towards Practical Applications of Transparent Machine Learning Algorithms via Latent Dirichlet Allocation." revised and re-submitted to Communications Design Quarterly.

RESEARCH EXPERIENCE

Statistical Speech Technology Group **Oct 2019 - current**

- Advised by Prof Mark Hasegawa-Johnson, study cocktail party problem and infant voice diarization
- Develop Multi-Decoder DPRNN for source separation with variable number of speakers

Intel SRC Scholar Grant **Dec 2019 - current**

- Work with Prof Jont Allen to verify that difficulty in language learning is due to confusion of phonemes
- Accepted $2500 funding from Intel SRC program and $500 from ISUR program
- Conduct hearing experiments, host an experiment website with uwsgi and nginx

New York Times Comment Analysis **Jan 2019 – Mar 2020**

- Work with Professor John Gallagher to analyze NYT comments. Apply LDA topic modelling and VADER sentiment analysis to comments.

WORK EXPERIENCE

Tencent Multimedia Lab **March 2021 - Aug 2021**
Applied Research *Shenzhen, China*

- Incoming gap semester research internship in video/audio conferencing system

Sensetime **Dec 2019 – Jan 2020**
Intern *Shanghai, China*

- Work under Cheng Li in AI-education group, wrote Support Vector Machine from scratch for machine learning tutorials
- Train high efficiency two-stage landmark localization networks based on YOLO and ResNet

Capital One, Center for Machine Learning **Sep 2019 - Dec 2019**
Software Intern *Champaign, IL*

- Work in Anti-Money Laundering Dept, analyze negative news to trace clients' illegal activities
- Apply Stanford NLP co-reference Annotator to extract references to persons of interest, use Latent Dirichlet Allocation to extract potential crime types from news report articles
- Lead design for a machine learning pipeline that uses above model to improve database query result

Brunswick Corporation, iJet Research Lab **Mar 2019 - Aug 2019**
Software Intern *Champaign, IL*

- Create lake environment simulation with Unreal Engine to developed self-navigation algorithm for boats; use Rapidly Exploring Random Tree for path finding; train segmentation & detection algorithms including Mask-RCNN, YOLOV3, UNet for object detection/segmentation Demo
- Lead design for a robust self-driving omnidirectional robot based on MobileNet, on a Nvidia Jetson chip Demo
- Analyze 601876 patents using Expectation Maximization for technology insight; classify satellite image using convolutional neural nets to find potential boat buyer locations

- Edit Python scripts to calculate rake/camber line/pitch from 3D propeller models; write control algorithms for Skydio drones to take marketing videos