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, Neuromorphic VLSI Design, 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:** Acoustics, Deep Learning, Neural Circuits
- **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 et al. "Identify Speakers in Cocktail Parties with End-to-End Attention." INTERSPEECH (2020).
2. Zhu, Junzhe et al. "Multi-Decoder DPRNN: High Accuracy Source Counting and Separation", submitted to ICASSP(2021)
3. Zhu, Junzhe et al. "A Comparison Study on Infant-Parent Voice Diarization", submitted to ICASSP(2021)
4. Zhu, Junzhe et al. "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

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

Halassa Lab @ MIT   **June 2020 - current**
- Use meta reinforcement learning to simulate mice behavior in foraging tasks and lever experiments. Analyze activation of neural networks to infer encoded information. Main goal is to provide theoretical guidance for experimenters.

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 2020 - Aug 2020**
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