

Peng Zan

7562 Elioak Ter, Gaithersburg, MD, 20879
zanpeng.pz@gmail.com (240)755-2606

EDUCATION

Ph.D. , Electrical and Computer Engineering University of Maryland, College Park, MD	12/2019 GPA 3.6
M.Sc. , Electrical and Computer Engineering University of Maryland, College Park, MD	08/2019 GPA 3.8
B.Sc. , Electrical Engineering Xi'an Jiaotong University, Xi'an, China	07/2014 GPA 90/100
Exchange , Electronic Engineering Chinese University of Hong Kong, Hong Kong, China	05/2013 GPA 3.7

WORK EXPERIENCE

Principal Scientist Origin Wireless AI, Greenbelt	02/2021-06/2021 MD
Principal Data Scientist Origin Wireless AI, Greenbelt	02/2020-02/2021 MD
DSP Research Intern Starkey Hearing Technologies, Eden Prairie	05/2019-08/2019 MN
Graduate Research Assistant University of Maryland, College Park	08/2015-05/2019 MD
Graduate Teaching Assistant University of Maryland, College Park	08/2014-05/2015 MD

INTEREST

Signal Processing, Machine Learning, Statistical Modeling.

PROJECTS

WiFi Sensing and Internet of Things (IoT) WiFi-Sensing for Home Security and Indoor Activity Monitoring	02/2020 - 06/2021 Algorithm Team, Origin Wireless AI
<ul style="list-style-type: none">• Researched and developed real-time algorithm for indoor motion and breathing localization using WiFi sensing based on <i>statistical electromagnetic field models</i>.• Designed and optimized indoor activity monitoring algorithms for HEX Home, our home security and activity monitoring system (CES 2021 Innovation Award), based on a <i>sequential decision model</i>.• Collaborated with companies such as Verizon, Alarm.com and Belkin to turn research into commercialized products.	
WiFi-Sensing Production Automation Designed and automated manufacture workflow for WiFi-sensing products by Python.	Hardware Team, Origin Wireless AI
<ul style="list-style-type: none">• Boosted production rate from one per hour to 10-12 per hour.• Supported Verizon Communications Inc. with quality products and visualization tools built by Python.	
Real-Time Tracking with IMU Sensors on Mobile Devices Developed a real-time tracking system with sub-meter accuracy based on a <i>Bayesian dynamic model on graph</i> .	Algorithm Team, Origin Wireless AI
<ul style="list-style-type: none">• Developed Android and iOS App for Origin Tracking product - work without WiFi.	
DNN-based Speech Enhancement Signal Processing Research, Starkey	06/2019 - 08/2019 Internship research
<ul style="list-style-type: none">• Designed and conducted subjective listening experiment to test DNN-based speech enhancement algorithms.• Analyzed experimental data and compared DNN algorithms.	
Joint Approach of Auditory Attention Decoding and Speech Enhancement [C1] Signal Processing Research, Starkey	05/2019 - 08/2019 Internship research
<ul style="list-style-type: none">• Designed and conducted electroencephalography (EEG) experiment to simulate a cocktail party scenario.• Collected auditory responses while subjects switch attention from one speaker to another.• Developed an <i>EEG guided Beamforming model</i> for joint approach of attention decoding and speech enhancement.	
Mutual Information Analysis of Auditory Brain Responses and Effects of Aging [J1][J2] Computational Sensorimotor Systems Lab, UMD	01/2018 - 05/2019 Thesis research
<ul style="list-style-type: none">• Developed a novel approach based on information theory to decode phase-locked response from M/EEG recording.• Revealed speech over-representation in the aging midbrain [J2] and cortical [J1] marker of behaviors.• Algorithm programmed in Matlab, source-space analysis done in Python and statistics conducted in R.	
Machine Learning Applications in Auditory Research [J3][J4] Computational Sensorimotor Systems Lab, UMD	06/2017 - 12/2017 Independent research
<ul style="list-style-type: none">• Implemented KNN and CNN for schizophrenia detection based on auditory steady-state response features (code).	

- Designed and compared neural decoders based on maximum likelihood estimation, linear regression and neural network to study adaptive efficient coding of correlated acoustic properties in auditory cortex of ferret [J3].
- Developed object and edge detection approach to extract pupillometry information from video recordings to study implicit memory for complex sounds in auditory cortex of ferret [J4].

SKILLS

Programming: Python (expert), C/C++, R

Software Tools: Matlab (expert), SPSS, MNE-Python, Eelbrain, Tensorflow, Pytorch, L^AT_EX, Git (Github), Linux/Unix

Software Engineering: Algorithms and Data Structure (Certificate), App Development, System Automation

Data Science: Statistics, Machine Learning (Certificate), Deep Learning (Certificate)

Data Engineering: Database, SQL

Research: Auditory Neuroscience Experiment Design, Electroencephalography (EEG), Magnetoencephalography (MEG)

JOURNAL PUBLICATIONS

- [J1] **Peng Zan**, Alessandro Presacco, Samira Anderson, and Jonathan Z. Simon. Exaggerated cortical representation of speech in older listeners: mutual information analysis. *Journal of Neurophysiology*, 124(4):1152-1164, Oct. 7, 2020.
- [J2] **Peng Zan**, Alessandro Presacco, Samira Anderson, and Jonathan Z. Simon. Mutual information analysis of neural representations of speech in noise in the aging midbrain. *Journal of Neurophysiology Innovative Methodology*, 122(6): 2372-2387, Dec. 4, 2019.
- [J3] Kai Lu, Wanyi Liu, Kelsey Dutta, **Peng Zan**, Jonathan B Fritz, and Shihab A. Shamma. Adaptive efficient coding of correlated acoustic properties. *The Journal of Neuroscience*, 39(44):8664-8678, Oct. 30, 2019.
- [J4] Kai Lu, Wanyi Liu, **Peng Zan**, Stephen V. David, Jonathan B Fritz, and Shihab A. Shamma. Implicit memory for complex sounds in higher auditory cortex of the ferret. *The Journal of Neuroscience*, 38(46):9955-9966, Nov. 14, 2018.
- [J5] Junmin Liu, Yongchang Hui, and **Peng Zan**. Locally linear detail injection for pansharpening. *IEEE Access*, 5:9728-9738, June 7, 2017.
- [J6] Dai Wang, Xiaohong Guan, Jiang Wu, Pan Li, **Peng Zan**, and Hui Xu. Integrated energy exchange scheduling for microgrids with electric vehicles. *IEEE Transaction on Smart Grid*, 7(4):17621774, July 10, 2016.

CONFERENCE PAPERS & POSTERS

- [C1] Wenqiang Pu, **Peng Zan**, Jinjun Xiao, Tao Zhang, Zhi-Quan Luo. Evaluation of joint auditory attention decoding and adaptive binaural beamforming approach for hearing devices with attention switching. *2020 IEEE International Conference on Acoustics, Speech, and Signal Processing*. 05/08/2020
- [C2] Mutual information analysis of neural representations of speech in noise in the aging midbrain
ARO 2019 02/09-13/2019
- [C3] Cortical over-representation of speech in older listeners correlates with a reduction in both behavioral inhibition and speech intelligibility
ARO 2019 02/09-13/2019
- [C4] Mutual information analysis of neural representations of speech in noise in the aging midbrain.
Auditory SPLASH 09/08/2018
- [C5] Mutual information analysis of neural representations of speech in noise in the aging midbrain.
EAR 2018 06/15/2018

PEER REVIEWS

- [R1] IEEE Access 07/2019
- [R2] IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing 01/2020
- [R3] IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing 03/2020
- [R4] Neuroscience Letters 04/2021
- [R5] IEEE Signal Processing Letters 05/2021
- [R6] IEEE Signal Processing Letters 06/2021
- [R7] Neuroscience Letters 07/2021

SELECTED AWARDS & HONORS

Starkey Recognition Award	Starkey, 08/2019
COMBINE Traveling Award	UMD, 12/2018
NSF-Funded COMBINE Fellowship (Computational Biological Network Program)	UMD, 09/2017
Jimmy H. C. Lin Graduate Scholarship for Entrepreneurship	UMD, 09/2014
ECE Ph.D. Fellowship Award	UMD, 09/2014