# YIYANG NAN

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## EDUCATION

**Brown University** — *Providence, RI*
M.S. in Computer Science — *May 2024 (Expected)*

**University of Michigan - Ann Arbor** — *Ann Arbor, MI*
B.S. in Data Science, Statistics, Mathematics of Finance — *Dec 2021*

## PUBLICATIONS AND MANUSCRIPTS

### Preprints

Nihal Nayak, **Yiyang Nan**, Avi Trost, Stephen Bach. "Learning to Generate Instruction Tuning Datasets for Zero-Shot Task Adaptation".

Weiguo Pian, **Yiyang Nan**, Shijian Deng, Shentong Mo, Yunhui Guo, Yapeng Tian. "Continual Audio-Visual Sound Separation"

Tianyu Yang, **Yiyang Nan**, Lisen Dai, Zhenwen Liang, Yapeng Tian, Xiangliang Zhang. "Audio-Visual Question Answering with Semantic Guidance".

Shijian Deng, Erin E. Kosloski, Siddhi Patel, Zeke Aharon Barnett, **Yiyang Nan**, Alexander Kaplan, Sisira Aarukapalli, William T. Doan, Matthew Wang, Harsh Singh, Pamela R Rollins, Yapeng Tian. "Hear Me, See Me, Understand Me: Audio-Visual Autism Behavior Recognition".

### Journal Papers

Hanrui Zhang, Ziyan Wang, **Yiyang Nan**, Bulat Zagidullin, Daiyao Yi, Jing Tang, Yuanfang Guan. "Harmonizing across Datasets to Improve the Transferability of Drug Combination Prediction". *Communications Biology*, 2023.

### Workshop Papers

Nihal Nayak, **Yiyang Nan**, Avi Trost, Stephen Bach. "Learning to Generate Instructions to Adapt Language Models to New Tasks". *Instruction Tuning and Instruction Following Workshop at Neural Information Processing Systems (NeurIPS), 2023.*

Weiguo Pian, **Yiyang Nan**, Shijian Deng, Shentong Mo, Yunhui Guo, Yapeng Tian. "Learning Continual Audio-Visual Sound Separation Models" *Sight and Sound Workshop at IEEE / CVF Computer Vision and Pattern Recognition Conference (CVPR)*, 2024.

Shijian Deng, Erin E. Kosloski, Siddhi Patel, Zeke Aharon Barnett, **Yiyang Nan**, Alexander Kaplan, Sisira Aarukapalli, William T. Doan, Matthew Wang, Harsh Singh, Pamela R Rollins, Yapeng Tian. "Audio-Visual Autism Behavior Recognition with Multimodal Large Language Models". *Sight and Sound Workshop at IEEE / CVF Computer Vision and Pattern Recognition Conference (CVPR)*, 2024.

## RESEARCH EXPERIENCE

**BATS Lab, Brown University** — Providence, RI
Advisor: Prof. Stephen Bach — *Sep. 2022 – Present*

Researched algorithms for language model decoding time tuning, examining how small proxy models can impact the logits output of larger models.

Researched the generation of synthetic instruction-tuning data conditioned on specialized domain context and task type attributes.

Participated in 2022 DARPA AI for Critical Mineral Assessment Competition and developed an adapted CLIP model with visual prompts to extract map features based on USGS map legend symbols.

**CVMC Lab, University of Texas - Dallas** Dallas, TX
Advisor: Prof. Yapeng Tian *Mar. 2023 – Present*

Collaborated on introducing continual learning problem in the context of audio-visual sound separation and investigated its issue of catastrophic forgetting.

Designed a network with source-wise learnable tokens to disentangle sound sources, extract semantically representations from inputs, and enhance performance in the Audio-Visual Question Answering

Introduced the most extensive dataset currently available for recognizing autism-related behaviors in children; Conducted benchmarking across various foundation models.

**Guan Lab, University of Michigan** Ann Arbor, MI
Advisor: Prof. Yuanfang Guan *Aug. 2021 – May 2023*

Rnked in 3rd place in 2022 Heart Failure: Microbiome FINRISK DREAM Challenge; Utilized a non-parametric ranking to transform the host phenotype data and modeled the survival risk for heart failure with ensembles of kernel-based and tree-based models.

Ranked in 4th place in 2022 Cough Diagnostic Algorithm for Tuberculosis (CODA TB) DREAM Challenge; Designed an LightGBM based approach with engineered cough sounds audio features and clinical information to predict the presence of Tuberculosis.

Participated in 2022 NeurIPS Weakly Supervised Cell Segmentation data challenge; Implemented the pipeline of Mask-RCNN with customized non-maximum suppression for whole-slide cell segmentation.

Proposed the standardization for the different concentration settings in different studies enables pharmacodynamics of monotherapies in machine learning models.

## SKILLS

**Programming:** Python (Proficient), R (Proficient), C++ (Intermediate), Java (Basic), SQL (Basic)

**Languages:** English (Fluent), Mandarin (Native)