

Chenyu Gao

369 Jacobs Hall, 2301 Vanderbilt Pl, Nashville, TN 37235

+1 (667) 910-5300 | chenyu.gao@vanderbilt.edu | [chenyugoal.github.io](https://github.com/chenyugoal) | [Google Scholar](https://scholar.google.com/citations?user=...)

RESEARCH INTERESTS

Image processing, machine learning, and computer vision with application to medical imaging.

EDUCATION

Vanderbilt University <i>Doctor of Philosophy in Electrical & Computer Engineering</i>	July 2022 – Present Nashville, TN
Johns Hopkins University <i>Master of Science in Biomedical Engineering, GPA: 3.84/4.0</i>	Aug 2020 – May 2022 Baltimore, MD
Sun Yat-sen University <i>Bachelor of Science in Biomedical Engineering, GPA: 3.7/4.0</i>	Aug 2016 – June 2020 Guangzhou, China

EXPERIENCE

Graduate Research Assistant <i>Medical-image Analysis and Statistical Interpretation Lab, Prof. Bennett Landman</i> <ul style="list-style-type: none">Statistical interpretation of the variance in the measurements from brain diffusion MRIs during aging.	July 2022 – Present Nashville, TN
Teaching Assistant <i>EN.520.623 Medical Image Analysis, Electrical & Computer Engineering</i> <ul style="list-style-type: none">Design homework assignments and the final project, which is about registration-based brain segmentation.Hold weekly office hours to answer questions from students.	Jan 2022 – May 2022 Baltimore, MD
Graduate Research Assistant <i>Image Analysis and Communication Lab, Prof. Jerry L. Prince</i> <ul style="list-style-type: none">Examine the effects of defacing algorithms on the segmentation of brain MRI.Implement traditional and deep-learning-based computer vision algorithms for tasks such as registration, segmentation, harmonization, super resolution, and so on.	Dec 2020 – May 2022 Baltimore, MD
Machine Learning Research Assistant <i>NeuroData, Prof. Joshua Vogelstein</i> <ul style="list-style-type: none">Extend the application of a homemade lifelong learning algorithm, <i>Progressive Learning</i>, to audio processing.Validate the omnidirectional knowledge transfer of the algorithm and visualize the result for publication.	Aug 2020 – May 2021 Baltimore, MD
Undergraduate Research Assistant <i>Sensor Technology and Biomedical Instruments Lab, Prof. Jun Wu</i> <ul style="list-style-type: none">Design and synthesize bioactive materials for bone tissue engineering.Support research teams in bone tissue regeneration as the in-vivo technical specialist. Perform craniotomy on more than 50 rats with a survival rate above 92 percent.	Aug 2017 – June 2020 Guangzhou, China

PROJECTS

High Throughput QA and Tabulation of Measurements From Longitudinal Diffusion MRI <i>Advisor: Prof. Bennett Landman</i> <p>We performed a high-throughput QA on the microstructural and macrostructural features measured from scan and re-scan diffusion MRIs acquired during 2742 sessions of 1035 subjects of the Baltimore Longitudinal Study of Aging (BLSA), whose age ranges from 22.4 to 103 years old. In the end, we generated a spreadsheet with 2742 rows and 13900 columns to share with our collaborators for studying aging.</p>	Nov 2022
Effects of Defacing Whole Head MRI on Neuroanalysis <i>Advisor: Prof. Jerry L. Prince</i> <p>Recent advances in magnetic resonance (MR) scanner quality and the rapidly improving nature of facial recognition software have necessitated the introduction of MR defacing algorithms to protect patient privacy. In this project, we evaluated six popular defacing algorithms in terms of their effects on brain segmentation. (presentation)</p>	July 2022

Shiny APP for Bird Recognition Using Convolutional Neural Network

May 2021

Advisor: Prof. Brian S. Caffo

Build a [website](#) for bird image classification from scratch in 8 days independently. It is based on a residual convolutional neural network that was pretrained on ImageNet by Keras and transferred onto Caltech-UCSD Birds. ([Demo](#))

Multimodal Brain Tumor Segmentation and Survival Prediction

May 2021

Advisor: Prof. Jerry L. Prince

Implement a 3D U-net and a cascaded anisotropic convolutional neural network for brain tumor segmentation. Based on the segmentation result, extract radiomic features to train a regression tree ensemble model for survival prediction. The presentation was the 1st place winner in the final competition. ([presentation](#))

Neural Decoding with Traditional and Advanced NLP Algorithms

Apr 2021

Advisor: Prof. Gene Y. Fridman

Inspired by the experiment of Elon Musk's Neuralink, in which the monkey could play video games with its imagination, we implement two algorithms in natural language processing, Kalman Filter and LSTM, for decoding 164-channel neural signals from a monkey controlling a cursor. ([Demo](#))

Computational Medicine: i) Imaging & ii) Physiome

Aug 2020 – Dec 2020

Advisor: Prof. Michael I. Miller, Prof. Tilak Ratnanather, Prof. Raimond L. Winslow, and Dr. Joseph L. Greenstein

- i) Perform statistical analysis to demonstrate the association between Alzheimer's disease and frontal lobe volumes, which are quantified from T1-weighted MRI scans with multi-atlas segmentation method.
- ii) Implement classical models to estimate cardiac output from arterial blood pressure using ICU physiologic data.

JOURNALS

Wang, Lili, Long Chen, Jiping Wang, Liying Wang, **Chenyu Gao**, Bo Li, Yuanzheng Wang, Jun Wu, and Changyun Quan. "Bioactive gelatin cryogels with BMP-2 biomimetic peptide and VEGF: A potential scaffold for synergistically induced osteogenesis." *Chinese Chemical Letters* 33, no. 4 (2022): 1956-1962.

CONFERENCES

Gao, Chenyu, Linghao Jin, Jerry L. Prince, and Aaron Carass. "Effects of defacing whole head MRI on neuroanalysis." In *Medical Imaging 2022: Image Processing*, vol. 12032, pp. 1010-1017. SPIE, 2022.

PREPRINTS

Joshua T. Vogelstein, Jayanta Dey, Hayden S. Helm, Will LeVine, Ronak D. Mehta, Tyler M. Tomita, Haoyin Xu, Ali Geisa, Qingyang Wang, Gido M. van de Ven, **Chenyu Gao**, Weiwei Yang, Bryan Tower, Jonathan Larson, Christopher M. White, Carey E. Priebe. "Representation ensembling for synergistic lifelong learning with quasilinear complexity." *arXiv preprint arXiv:2004.12908* (2020).

PRESENTATIONS

- 2nd Annual ECE Day, Department of Electrical and Computer Engineering, Vanderbilt University, April 17th, 2023
- 4th Annual Vanderbilt Alzheimer's Disease Research Day, Vanderbilt University Medical Center, March 24th 2023
- 11th Annual Surgery, Intervention, and Engineering Symposium, Vanderbilt Institute for Surgery and Engineering (VISE), December 7th, 2022

REVIEWERS

45th Annual International Conference of the IEEE Engineering in Medicine & Biology Conference (EMBC)

AWARDS & HONORS

- Scholarship of Sun Yat-sen University for Outstanding Students Sept 2019
- Scholarship of Sun Yat-sen University for Academic Progress Jan 2019
- 2nd Prize: Guangdong Undergraduate BME Innovation Design Competition Aug 2018