Zheng (Peter) Ding

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EDUCATION

Case Western Reserve University — Cleveland, OH
PhD in Biomedical Engineering — Sep 2019 – Dec 2024
Advisor: Dr. Zhong Irene Wang
Dissertation: Voxel-based Post-processing with Magnetic Resonance Fingerprinting for Focal Cortical Dysplasia

Johns Hopkins University — Maryland, MD
Master of Science in Biomedical Engineering — Sep 2016 – May 2017
Bachelor of Science in Biomedical Engineering — Sep 2012 – Dec 2015

Skills:
High-performance computing; Data processing, analysis and visualization; Deep learning; Medical image reconstruction and processing.
Coding and scripting languages: Python, MATLAB, C++, R, SQL.
Familiar software packages: PyTorch, TensorFlow, sklearn, Pandas, OpenCV, Nibabel, FSL, FreeSurfer, Docker, Git.

Relevant Courseworks: Deep Learning, Machine Learning, Learning Theory, Computer Vision, Software Development Process, High-Dimensional Analytics, Physics of Imaging, Signals and Systems, Models and Simulations, Probability and Statistics, Biomedical Instrumentation and Design, Molecular Biology, Pharmacokinetics and Pharmacodynamics, Systems Bioengineering, Statistical Thermodynamics.

Professional Experience

Cleveland Clinic — Cleveland, OH
Graduate Research Assistant — Sep 2019 – Dec 2024

- Built and trained machine learning and deep learning pipelines on HPC for focal epilepsy lesion detection with experimentation of various network architectures such as U-Net, Efficient Net, and vision transformers.
- Developed Python and MATLAB code for multimodal MRI and quantitative MRI image processing and analysis.
- Conference posters at International Society of Magnetic Resonance in Medicine (ISMRM) and American Epilepsy Society (AES) Annual Meeting resulting in publications and pending publications (see second page).
- Summa Cum Laude merit award at ISMRM 2023. Mary B Stark Travel Award at Cleveland Clinic in 2023.
- Performed statistical parametric mapping on MRI, PET, and fMRI to help clinicians locate subtle lesions and enhance image quality (denoising, bias field correction, motion reduction etc.) for novel qMRI technique.
- Supervised the acquisitions of multimodal MRI data including T1w, T2w, MRF, FLAIR, fMRI, and DTI on Siemens Prisma Scanner. Regularly attend patient management conferences with clinicians.
- Teaching assistant for Physics of MRI and Biomedical Senior Design classes.

Johns Hopkins University Institute of Cell Engineering — Baltimore, MD
Research Technologist — Jan 2018 – Jun 2019

- Lead investigation of methods to load biological cargo (DNA and proteins) into extracellular vesicles (EVs) by liposome fusion and electroporation. Successfully loaded superparamagnetic iron oxide nanoparticles into EVs and enhanced EV uptake by iPSCs.
- Conducted gene ontology and pathway enrichment analysis to identify candidate genes and proteins.
- Wrote MATLAB and R scripts for compiling and analyzed large scale proteomics and RNA-seq data.
- Performed target sequence cloning and CRISPR/CAS9 gene-editing on iPSC and 293T cells.
- Contributed to writing and editing of manuscripts for publications

Intern - Regeneron Pharmaceuticals — Tarrytown, NY
Pre-clinical pharmacokinetics intern — May 2016 – Aug 2016

- Analyzed pharmacokinetics data from monoclonal antibody animal studies with Phoenix WinNonLin.
- Wrote MATLAB scripts to simulate model, estimated parameters, and scanned for parameter sensitivities.
- Contributed to the database using SQL after analyzing results in past studies for future reference.

Johns Hopkins University Center for Nanomedicine — Baltimore, MD
Part-time Research Assistant — May 2014 – Aug 2017

- Produced sterile polymer micro- and nanoparticles for delivery of a variety of drugs to treat ocular diseases.
- Optimized loading efficiency of drugs by adjusting the compositions of emulsion and encapsulating polymers.
- Tracked *in vitro* release data of drug particles using HPLC on a regular basis and sometimes with UV-vis.
- Conducted pharmacokinetic studies in rats by analyzing the concentration and distribution of particles based on fluorescence.

Publications and Manuscripts

Zheng Ding, Spencer W Morris, Siyuan Hu, Ting-Yu Su, Joon Yul Choi, Ingmar Blümcke, Xiaofeng Wang, Ken Sakaie, Hiroatsu Murakami, Andreas V Alexopoulos, Stephen E Jones, Imad Najm, Dan Ma, Zhong Irene Wang. Automated Whole-brain Focal Cortical Dysplasia Detection using MR Fingerprinting with Deep Learning. Accepted by *Neurology* (Oral presentation at *ISMRM 2025*)

Zheng Ding, Zhong Irene Wang. Chapter 11: Image Post-processing and Analysis Techniques. *MR Fingerprinting for Quantitative MR*. Academic Press, to be published with book in Sep 2025.

Ting-Yu Su, Siyuan Hu, Xiaofeng Wang, Sophie Adler, Konrad Wagstyl, **Zheng Ding**, Joon Yul Choi, Ken Sakaie, Ingmar Blumcke, Hiroatsu Murakami, Stephen E Jones, Imad Najm, Dan Ma, Zhong Irene Wang. Automated Whole-brain Focal Cortical Dysplasia Detection using MR Fingerprinting with Deep Learning. In preparation for submission to Epilepsia.

Zheng Ding, Ting-Yu Su, Siyuan Hu, Joon Yul Choi, Ken Sakaie, Hiroatsu Murakami, Ingmar Blümcke, Stephen E Jones, Imad Najm, Dan Ma, Zhong Irene Wang. Multiparametric Quantitative Measurement of Lesion Gradient in Focal Cortical Dysplasia. In preparation for submission. (Presented at *AES 2023 annual meeting*)

Ting-Yu Su, Joon Yul Choi, Siyuan Hu, Xiaofeng Wang, Ingmar Blümcke, Katherine Chiprean, Balu Krishnan, **Zheng Ding**, Ken Sakaie, Hiroatsu Murakami, Andreas V Alexopoulos, Imad Najm, Stephen E Jones, Dan Ma, Zhong Irene Wang. Multiparametric Characterization of Focal Cortical Dysplasia Using 3D MR Fingerprinting. *Annals of Neurology*. August 2024.

Zheng Ding, Siyuan Hu, Ting-Yu Su, Joon Yul Choi, Spencer Morris, Xiaofeng Wang, Ken Sakaie, Hiroatsu Murakami, Hans-Jürgen Huppertz, Ingmar Blümcke, Stephen Jones, Imad Najm, Dan Ma, Zhong Irene Wang. Combining magnetic resonance fingerprinting with voxel-based morphometric analysis to reduce false positives for focal cortical dysplasia detection. *Epilepsia*. Mar 2024. (Presented at *ISMRM 2023*)

----------Publications from before PhD----------

T. Meng, J. Zheng, M. Chen, Y. Zhao, H. Sudarjat, A. Alex, V. Kulkarni, Y. Oh, S. Xia, **Z. Ding**, H. Han, N. Anders, M. Rudek, W Chow, W. Stark, L. Ensign, J. Hanes, Q. Xu. Six-month effective treatment of corneal graft rejection. *Science Advances*, Mar 2023.

S. Xia, **Z. Ding**, L. Luo, B. Chen, J. Schneider, J. Yang, C. Eberhart, W. Stark, Q. Xu, J. Hanes. Shear-thinning viscous materials for subconjunctival injection of microparticles. *AAPS PharmSciTech*, Jan 2021.

Z. Han, S. Liu, Y. Pei, **Z. Ding**, Y. Li, X. Wang, D. Zhan, S. Xia, T. Driedonks, K.W. Witwer, R. Weiss, P. van Zijl, J. Bulte, L. Cheng, G. Liu. Highly efficient magnetic labelling allows MRI tracking of the homing of stem cell-derived extracellular vesicles following systemic delivery. *Journal of Extracellular Vesicles*, Jan 2021.

L. Luo, Q. Xu, J. Yang, Y. Oh, M. Hartsock, S. Xia, **Z. Ding**, D. Emert, Y. Kim, C. Eberhart, L. Ensign, J. Thorne, W. Stark, E. Duh, J. Hanes. Controlled release of corticosteroid with biodegradable nanoparticles for treating experimental autoimmune uveitis.
Journal of Controlled Release, Jan 2019.

S. Liu, V. Mahairaki, H. Bai, **Z. Ding**, K. Witwer, L. Cheng. Highly purified human extracellular vesicles produced by stem cells alleviate aging cellular phenotypes of senescent human cells. *Stem Cells,* Feb 2019.

B. Wang, Y. Tang, B. Chen, Y. Oh, N. Lamb, S. Xia, **Z. Ding**, D. Emmert, M. Suarez, C. Eberhart, L. Ensign, W. Stark, Q. Xu, J. Hanes. Dexamethasone sodium phosphate-loaded biodegreadable nanoparticles inhibited experimental neovascularization following subconjunctival injection. *Nanomedicine: Nanotechnology, Biology and Medicine,* Jan 2019.