YUHUA CHEN

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Visionary AI Leader Specializing in DL/GenAI Since 2015 for Computer Vision and Medical Imaging Applications

EDUCATION

University of California, Los Angeles — *Los Angeles, CA*
- Ph.D. in Bioengineering. GPA 3.9/4.0 — *Sep. 2016 – June 2021*

University of Pennsylvania — *Philadelphia, PA*
- M.S. in Computer & Information Technology, GPA 3.7/4.0 — *Jan. 2015 – May. 2016*
- M.S. in Bioengineering, GPA 3.8/4.0 — *Sep. 2011 – Dec. 2014*

Northeastern University — *Shenyang, CN*
- B.S. in Biomedical Engineering, GPA 3.8/4.0 — *Sep. 2007 – Jul. 2011*

INDUSTRY EXPERIENCE

Q Bio. — *San Carlos, CA*

Staff Machine Learning Engineer / AI Research Lead — *May 2024 – Present*
- Defined and executed the company's long-term AI and data strategy with executive and VP level, significantly influencing cross-departmental technological frontier advancements.
- Strategized and led the development of advanced multi-modal large language models integrating medical knowledge with visual foundation models, spearheading innovative AI applications throughout the company.
- Directed the development and deployment of a Generative Diffusion Model-based Visual Foundation Model, significantly enhancing vision-related AI tasks and broadening application scopes.
- Founded the AI Research Team, fostering cross-functional and cross-department collaboration to successfully initiate and advance the company's strategic goal of developing a digital twin technology.

Senior Machine Learning Engineer — *Mar. 2023 – May 2024*
- Focus on the engineering and deployment of 3D AI models seamlessly into the Mark-0 scanner, achieving sub-second inference times to make the company's MRI product fully autonomous.
- Led project initiatives, development, and deployment of multiple AI models (GAN/Transformers) for imaging acceleration, up to 9x scan time reduction, and image quality enhancement, boosting resolution up to 27x.
- Explored and rapidly prototyped innovative AI concepts, significantly enhancing the company's fundraising process and attracting new investors' interest.

Machine Learning Engineer — *Sep. 2021 – Mar. 2023*
- Developed and implemented a robust end-to-end deep learning framework from scratch, enhancing model training efficiency and scalability to multi-gpu and multi-nodes training, now a cornerstone of the company's AI training infrastructure.
- Designed and launched several 3D MRI segmentation and fast image reconstruction AI models, improving data processing times by 3000x, now critical in daily operations.

Nvidia Corp. — *Bethesda, MD*

Applied Research Intern, Medical Imaging — *Jun. 2020 – Sep. 2020*
- Pioneered a Network Architecture Search (NAS) method, cutting search times from weeks to minutes.
- Set up a large-scale NAS benchmarking on 3D medical image segmentation (>28 K GPU hrs training).

VoxelCloud Inc. — *Los Angeles, CA*

Leading Research Scientist Intern — *Jun. 2017 – Oct. 2017*
- Innovated a multi-modal 3D model for simultaneous nodule detection, segmentation, and characterization.
- Achieved leading performance on the LIDC-IDRI dataset and led a team reporting to CEO Dr. Ding.

Philips Research North America *Cambridge, MA*

Research Scientist Intern *Jul. 2016 – Sep. 2016*

- Proposed and independently developed neural networks (LSTM) to identify congestive heart failure patients using vast time-series data (CHR), achieving an AUROC of 88.55.

Massachusetts General Hospital (MGH) / Harvard-MIT (HST) *Cambridge, MA*

Research Student Intern *Jul. 2016 – Sep. 2016*

- Advanced the fast Hough transformation algorithm for brain MR tractography.

Samsung Advanced Institute of Technology *Beijing, CN*

Research Intern *Jul. 2012 – Dec. 2012*

- Implemented the multi-atlas label fusion (MALF) segmentation algorithm, achieving high-accuracy results.

ACADEMIA EXPERIENCE

UCLA / Cedars-Sinai Medical Center *Los Angeles, CA*

Ph.D. Researcher

Single Image Super-Resolution in MRI Using Generative Adversarial Network (GAN) *Nov. 2016 – June 2021*

- Developed cutting-edge MRI enhancement techniques, significantly improving image resolution (4-20x).

MALIBU: Multitasking-MRI Accelerated Nonlinear Image-Based Reconstruction *Sep. 2018 – Dec. 2019*

- Designed a deep learning framework for 5-D quantitative MRI, enhancing reconstruction runtime by 3000x.

ALAMO: Automated Deep Learning-Based Abdominal Multi-Organ Segmentation *Feb. 2019 – June 2020*

- Developed a multi-view fusion 2D NN for abdominal MRI segmentation, achieving top-tier performance.

University of Pennsylvania *Philadelphia, PA*

Master's Researcher

Mini-Google Search Engine Using MapReduce *Apr.2016 – May. 2016*

- Large-scale distributed parallel programming for web crawling, page rank algorithm, and result aggregation.

Twitter User Gender Prediction Using Machine Learning *Nov. 2015- Dec. 2015*

- Predicted user genders based on tweets and profile images; reached 90% accuracy on the test dataset.

Penn Working Dog Center Volunteer Tracker (Android App) *Sep. 2015 – Dec. 2015*

- Redesigned a personnel management Android app with multiple features.

SKILLS AND INTERESTS

Technical Skills:

Programming Languages: Python, Java, C/C++, MATLAB, HTML, SQL, CUDA
Frameworks: PyTorch, PyTorch Lightning, TensorFlow, Keras, Hugging Face
Tools and Environments: PyCharm, Linux, macOS, AWS

Professional Interests:

Development and Deployment: Scaling machine learning models, particularly in high-compute environments
Research Areas: Pioneering in generative AI, including GAN, diffusion models and foundation models
Industry Apps: Building reliable, scalable AI solutions for critical real-world applications (healthcare, i.e.).

SELECTED PUBLICATIONS

1. ***Yuhua Chen****, Dan Ruan, Jiayu Xiao, Lixia Wang, Bin Sun, Rola Saouaf, Wensha Yang, Debiao Li, and Zhaoyang Fan.* "Fully Automated Multi-Organ Segmentation in Abdominal Magnetic Resonance Imaging with Deep Neural Networks." Journal *Med. Phys., 47: 4971-4982. doi:10.1002/mp.14429*
2. *Jiancong Wang*, **Yuhua Chen***, Yifan Wu, Jianbo Shi, and James Gee.* **"**Enhanced generative adversarial network for 3D brain MRI super-resolution**."** 2020 IEEE Winter Conference on Applications of Computer Vision (**WACV**). IEEE, 2020. *(* equal contributor)*
3. ***Yuhua Chen****, Jaime L. Shaw, Yibin Xie, Debiao Li, and Anthony G. Christodoulou.* "Deep learning within a priori temporal feature spaces for large-scale dynamic MR image reconstruction: Application to 5-D cardiac MR

Multitasking." International Conference on Medical Image Computing and Computer-Assisted Intervention (**MICCAI**), pp. 495-504. Springer, Cham, 2019.

4. ***Yuhua Chen****, Feng Shi, Anthony G. Christodoulou, Yibin Xie, Zhengwei Zhou, and Debiao Li. "*Efficient and accurate MRI super-resolution using a generative adversarial network and 3D multi-level densely connected network." International Conference on Medical Image Computing and Computer-Assisted Intervention (**MICCAI**), pp. 91-99. Springer, Cham, 2018.
5. ***Yuhua Chen,*** *Yibin Xie, Zhengwei Zhou, Feng Shi, Anthony G. Christodoulou, and Debiao Li.* "Brain MRI super resolution using 3D deep densely connected neural networks." In 2018 IEEE 15th International Symposium on Biomedical Imaging (**ISBI** 2018), pp. 739-742. IEEE, 2018.

PATENTS

- *Anthony Christodoulou, Debiao Li, and* ***Yuhua Chen***. "SYSTEMS AND METHODS OF DEEP LEARNING FOR LARGE-SCALE DYNAMIC MAGNETIC RESONANCE IMAGE RECONSTRUCTION." U.S. Patent Application No. 62/900,279, filed Sep. 13, 2019
- *Yibin Xie, Debiao Li, Damini Dey, and* ***Yuhua Chen***. "SYSTEMS AND METHODS FOR CALCIUM-FREE COMPUTED TOMOGRAPHY ANGIOGRAPHY.", WO Patent WO2020172188A1, Application No. PCT /US2020/018678, published 8/27/2020

AWARDS

- MICCAI — Young Scientist Publication Impact Award Finalist
- Society of MRA — 2020 Potchen-Passariello Award, 2nd Runner-up
- ISMRM — Magna Cum Laude Abstract, 2018
- UCLA — Ph.D. Fellowship, 2016 - 2017
- Northeastern University — College Scholarship, 2009-2011

REVIEWER

International Conference on Medical Image Computing and Computer-Assisted Intervention (MICCAI)
Journal of IEEE Transactions on Medical Imaging (IEEE-TMI)
Medical Image Analysis
Neurocomputing Journal
Journal of Medical Physics
European Journal of Radiology
Journal of IEEE Access
Journal of Biomedical and Health Informatics (IEEE-BHI)