

# ZIYI (FRANCIS) YIN

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## EDUCATION

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### Georgia Institute of Technology

*Ph.D. in Computational Science and Engineering*

Advisor: Prof. Felix J. Herrmann, GPA: 4.00/4.00

Atlanta, GA

*Aug 2019 - Present*

### Emory University

*B.S. in Mathematics and Computer Science (summa cum laude)*

Advisor: Prof. James G. Nagy, GPA: 3.98/4.00

Member of Phi Beta Kappa Honor Society

Atlanta, GA

*Aug 2017 - May 2019*

### Beihang University

*Major: Mathematics*

Beijing, China

*Sep 2015 - Jul 2017*

## RESEARCH INTEREST

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Machine Learning, Scientific Computing, PDE-constrained Optimization, Inverse Problems

## PUBLICATIONS

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[1] Ziyi Yin, Rafael Orozco, Philipp Witte, et al. "Extended source imaging, a unifying framework for seismic & medical imaging". Apr. 2020. url: <https://arxiv.org/abs/2004.07389>.

## RESEARCH EXPERIENCE

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### Georgia Institute of Technology

*Graduate Research Assistant*

Atlanta, GA

*Aug 2019 - Present*

- Advisor: Prof. Felix J. Herrmann
- Conduct research in SLIM (Seismic Laboratory for Imaging and Modeling) group on deep learning applications of wave-equation based imaging, such as seismic and photoacoustic imaging
- Focus research on loop-unrolled imaging on solving Helmholtz equations, combine traditional Krylov-based GMRES solver with convolutional neural network by parameterizing iteration histories
- Work on extended source imaging in wavefield reconstruction inversion problems with variable projection methods; currently work on loop-unrolling CG algorithm for source estimation and generate short-wavelength images by automatic differentiation through iteration histories

### Pactera Technology International Ltd.

*Machine Learning Intern*

Dalian, China

*May 2019 - Aug 2019*

- Engaged in research in Natural Language Processing in the field of machine learning and deep learning models (neural network/ensemble learning)
- Developed highly scalable classifiers according to TensorFlow and BERT to improve the performance of chat bots in a daily communication setting
- Improved the classifiers gradually to extract more ambiguous intents from users' texts in various cases

### Emory University

*Honors Research*

Atlanta, GA

*Jul 2018 - Apr 2019*

- Advisor: Prof. James G. Nagy
- Awarded Highest Honors (Summa Cum Laude) in Applied Mathematics and Statistics
- Conducted individual research on numerical solutions to large-scale ill-posed inverse problems, and applications in X-ray tomography imaging
- Derived Regularized Conjugate Gradient Method in MATLAB, which integrates the image segmentation result as a prior and solve the penalized least squares problem to reconstruct the whole image
- Wrote honor thesis - Edge Detection and Enriched Subspaces, defended thesis against thesis examination committee and published thesis in Emory Electronic Theses and Dissertations (ETD) Repository

## LEADERSHIP EXPERIENCE

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### **Society of Exploration Geophysicists**

Atlanta, GA

#### ***Secretary, Georgia Tech Student Chapter***

*Nov 2019 - Present*

- Hold bi-weekly seminars within Schools of Computational Science and Engineering, Earth and Atmospheric Sciences, Electrical and Computer Engineering; invite senior students and outstanding professors to share research projects and intern experiences
- Organize workshops to invite senior students and career advisors to introduce industry relationship, help students revise resume and help practice interview skills
- Make future plans about field trip of seismic experiment, SEG event participation and fundings

### **EPASS Peer Tutoring Program, Emory University**

Atlanta, GA

#### ***Teaching Assistant***

*May 2018 - May 2019*

- Conducted face-to-face sessions for math students up to 6 hours each week
- Review and summarize key points of the course contents
- Explain practice problems and project questions to students

### **Office of Undergraduate Studies, Emory University**

Atlanta, GA

#### ***Academic Fellow***

*Aug 2018 - May 2019*

- Co-Conducted orientations for Emory Class of 2022 freshmen, and co-hosted info sessions
- Mentored eight international students throughout freshman year regarding both academics and lives
- Organized two meetings with these eight international students each month regarding starting a new academic life at Emory and blending into the local culture

## SKILLS

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- Programming: Python, MATLAB, Julia, Java, C/C++, PyTorch, SQL, PHP, R, Assembly, L<sup>A</sup>T<sub>E</sub>X
- Language: English (Proficient), Mandarin (Native), German (Elementary)