# CURRICULUM VITAE


## Yimin Zhong

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## Research Interests

Scientific computing: PDE based fast algorithm; numerical optimization; low rank approximation

Inverse problems and imaging: Hybrid multiphysics inverse problems; Inverse transport problems; Control theory for hybrid multiphysics system.

## Education

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| 2018.01 – | Postdoc, University of California, Irvine |
| 2017.09 – 2017.12 | Postdoc, ICERM, Brown University |
| 2011.09 – 2017.08 | Ph.D., Department of Mathematics, University of Texas at Austin<br>Advisor: Kui Ren |
| 2007.09 – 2011.07 | B.S. University of Science and Technology of China, P.R.China |

## Teaching Experiences

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|---|---|
| 2019 Spring | *MATH110B: Optimization II* |
| 2019 Winter | *MATH110A: Optimization I* |
| 2018 Fall | *MATH9: Introduction to Programming in numerical analysis* |
| 2018 Spring | *MATH2B: Calculus II* |
| 2018 Winter | *MATH2B: Calculus II* |

Teaching assistant

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| 2016 Fall | *M427L: Advanced Calculus for Application II* |
| 2015 Fall | *M408C: Differential and Integral Calculus* |
| 2015 Spring | *M387D: Numerical Analysis: Differential Equations* |
| 2014 Fall | *M387C: Numerical Analysis: Algebra & Approximation* |
| 2014 Spring | *M427L: Advanced Calculus for Application II* |
| 2013 Fall | *M387C: Numerical Analysis: Algebra & Approximation* |
| 2013 Summer | *M F316: Elementary Statistical Methods* |
| 2013 Summer | *M F325K: Discrete Mathematics* |
| 2013 Spring | *M408L: Integral Calculus* |
| 2012 Fall | *M408C: Differential and Integral Calculus* |

## Publications and Preprints

1. K. Ren, R. Zhang and Y. Zhong, *Inverse transport problems in quantitative PAT for molecular imaging*, Inverse Problems, 31, 125012, 2015
2. K. Ren, R. Zhang and Y. Zhong, *A FMM-based algorithm for radiative transport in isotropic media*, submitted, 2016
3. K. Ren and Y. Zhong, *Reconstruction of acoustic and optical properties in PAT/TAT with data from multiple illuminations*, Preprint, 2017
4. K. Ren, H. Tsai, Y. Zhong, *An implicit boundary integral method for computing electric potential of macromolecules in solvent*, Journal of Computational Physics, 2018
5. H. Zhao, Y. Zhong, *A hybrid method for reflection traveltime tomography*, SIAM J. Imaging Sci., 12(1), 28-53, 2019
6. W. Li, Y. Yang, Y. Zhong, *A hybrid inverse problem in the fluorescence ultrasound modulated optical tomography in diffusive regime* , SIAM J. Appl. Math., 79(1), 356-376, 2019
7. J. Bryson, H. Zhao, Y. Zhong, *Intrinsic complexity and scaling laws: from random fields to random vectors*, Multiscale Model. Simul., 17(1), 460-481, 2019
8. H. Zhao, Y. Zhong, *Instability of the inverse problem for the stationary radiative transport equation*, under revision, 2018
9. W. Li, Y. Yang, Y. Zhong, *An inverse transport problem in the fluorescence ultrasound modulated optical tomography*, submitted, 2018
10. K. Ren and Y. Zhong, *Imaging point sources in heterogeneous media*, submitted, 2019

## Invited Presentations

Jan 2019, JMM 2019, *One step reconstruction in QPAT*

Nov 2018, Applied Math Seminar at UW Madison, *instability of inverse radiative transfer*

Oct 2018, AMS section meeting, *A hybrid method for reflection traveltime tomography*

Oct 2018, 4th Annual Meeting SIAM central states section, *A fast preconditioner for radiative transfer*

April 2018, SOCAMS, *Inverse problem in fluorescent ultrasound modulated optical tomography*

Oct 2017, Houston Imaging Sciences Symposium, *One-step reconstruction in photoacoustic tomography*

September 2017, Texas Applied Mathematics and Engineering Symposium, *A fast preconditioner for radiative transfer*

April 2017, Applied Math Seminar at UCI, *A fast preconditioner for Radiative Transfer Equation*

March 2017, SIAM Conference on Computational Science & Imaging, *An FMM preconditioner for radiative transport equation*

March 2017, SIAM Conference on Computational Science & Imaging, *Inverse transport problems in quantitative PAT for molecular imaging*

January 2017, Joint Mathematics Meeting: *A fast algorithm for isotropic radiative transport equation*

May 2016, SIAM Conference on Imaging Science, *Inverse transport problems in quantitative PAT for molecular imaging*, Albuquerque. NM.

February 2016, Numerical Analysis Seminar, *Existence and stability estimate of $H_p^1$ solution of radiative transport system*, University of Texas, Austin, TX.

December 2015, Numerical Analysis Seminar, *Inverse transport problems in quantitative PAT for molecular imaging*, University of Science and Technology of China, Hefei, China.

February 2013, Schlumberger Applied Mathematics Webinar, *Recovering Point Sources in Unknown Environment with Differential Data*, Houston, TX.

Oct 2012, Workshop on Inverse Problems, *Inverse Problems for Maxwell's Equation in isotropic media*, Texas A & M University, College Station, TX.

## Awards and Honors

2018 *Frank Gerth III Dissertation Award*

2016 *SIAM Student Travel Award*

2013 *Frank Gerth III Graduate Excellence Award*

2011 *First Prize of Computational Mathematics Summer Camp at Chinese Academy of Science*

2011 *First Prize of Contest of Mathematics of Undergraduate of China*

## Professional Services

Referee for Journals: *Inverse Problem, SIAM Journal on Applied Mathematics, Journal of Computational and Applied Mathematics, SIAM Journal on Imaging Science, Journal of Selected Topics in Quantum Electronics, SIAM Journal on Scientific Computing, etc.*

Co-organizer of minisymposium for *SIAM CSE 2017*.

## Miscellaneous Academic Activities

April 2019, IMA workshop on Mathematics in Optical Imaging

June 2018, participate MPI 2018 at Harvey Mudd College

October 2017, Talk in ICERM seminar: *numerical algorithms for radiative transfer*

September 2017, Participate workshop *Mathematical and Computational Challenges in Radar and Seismic Reconstruction* at ICERM, Brown University

June 2017, Participate conference *Modern Advances in Computational and Applied Mathematics* at Yale.

February 2017, Participate in conference *Big Data Meets Computation* at IPAM, UCLA.

April 2016, Talk in Junior Numerical Analysis Seminar at UT Austin: *One step reconstruction of acoustic and optical properties in PAT*.

February 2016, Participate in KI-Net conference on *Advances in kinetic and fluid dynamics transport: Analysis and approximations*

October 2015, Participate in conference on *Numerical and Multiscale Issues for Partial and Integral Differential Equations* (in honor of Björn Engquist's 70th birthday).

May 2015, Talk in Junior Numerical Analysis Seminar at UT Austin: *Uniqueness and Stability in BLT*

March 2014, Participate in Texas Consortium for Computational Seismology Tenth Bi-Annual Research Meeting at Houston

July 2013, Participate in the MSRI Graduate Summer School on: *Introduction to the Mathematics of Seismic Imaging*.

April 2013, Talk in Junior Numerical Analysis Seminar at UT Austin: *Solvability of degenerate elliptic problem in 2D*.

March 2013, Talk in Junior Numerical Analysis Seminar at UT Austin: *Stability of inverse source problem*.

## Programming Skills

C++/C, Python, Java, Julia, MATLAB, Fortran