Zheng **Ma**

Golomb Visiting Assistant Professor of Mathematics

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"Be the change that you want to see in the world."

Experience

Purdue University   *West Lafayette, USA*
Golomb Visiting Assistant Professor of Mathematics   *Aug. 2017 - Now*
- Mentor: Jingwei Hu

University of Wisconsin Madison   *Madison, USA*
Visiting Scholar of Mathematics Department   *Feb. 2015 - Dec. 2015*
- Collaborator: Shi Jin

Duke University   *Durham, USA*
Visiting   *Feb. 2015 - Dec. 2015*
- Collaborator: Jian-Guo Liu

Education

Shanghai Jiao Tong Univeristy   *Shanghai, China*
Ph.D. in Computational Mathematics   *Sep. 2012 - July. 2017*
- Dissertation: Numerical Methods for Transport Equations and Wave Propagations with Multiple Scales and Uncertainty
- Advisor: Prof. Shi Jin

Zhiyuan College, Shanghai Jiao Tong Univeristy   *Shanghai, China*
B.S. in Mathematics and Applied Mathematics   *Sep. 2008 - July. 2012*
- Minor: Applied Physics
- Thesis: The WENO Scheme for Liouville Equation of Geometrical Optics with Discontinuous Local Wave Speeds
- Advisor: Prof. Shi Jin

Presentation

XVI International Conference on Hyperbolic Problems: Theory Numerics, Applications   *Aachen, Germanny*
Presenter for Session on UQ/Stochastic   *Aug. 2016*
- Introduced the history of web technology and the JAM stack which is for the modern web application development.
- Introduced how to freely host the web application with high performance utilizing global CDN services.

The 10th International Conference on Computational Physics   *Macao, China*
Presenter for Mini-Symposium on Numerical Simulation and Mathematical Modeling of Kinetic Equations   *Jan. 2017*
- Introduced CTF(Capture the Flag) hacking competition and advanced techniques and strategy for CTF

Innovative Trends in the Numerical Analysis & Simulation of Kinetic Equations   *Oberwolfach, Germanny*
Presenter for Oberwolfach Mini-Workshop   *Dec. 2018*
- Introduced basic procedure for penetration testing and how to use Metasploit

Honors & Awards

International

2019   **Best Article Awards**, Celebrating the 5th anniversary of Research in the Mathematical Sciences

Domestic

2015   **3rd Place**, WITHCON Hacking Competition Final   *Seoul, S.Korea*

Publications

Journal Articles

[1] **A Fast Spectral Method for the Inelastic Boltzmann Collision Operator and Application to Heated Granular Gases**
J. Hu, Z. Ma
Journal of Computational Physics 385 (2019) pp. 119–134. 2019.

[2] **The Discrete Stochastic Galerkin Method for Hyperbolic Equations with Non-smooth and Random Coeffi cients**
S. Jin, Z. Ma
Journal of Scientific Computing 74.1 (Jan. 2018) pp. 97–121. 2018.

[3] **Uniform Spectral Convergence of the Stochastic Galerkin Method for the Linear Transport Equations with Random Inputs in Diffusive Regime and a Micro-Macro Decomposition-Based Asymptotic-Preserving Method**
S. Jin, J.-G. Liu, Z. Ma
Research in the Mathematical Sciences 4.1 (Aug. 2017) p. 15. 2017.

[4] **Explicit and Implicit TVD Schemes for Conservation Laws with Caputo Derivatives**
J.-G. Liu, Z. Ma, Z. Zhou
Journal of Scientific Computing 72.1 (July 2017) pp. 291–313. 2017.

[5] **An Improved Semi-Lagrangian Time Splitting Spectral Method for the Semi-classical Schrödinger Equation with Vector Potentials Using NUFFT**
Z. Ma, Y. Zhang, Z. Zhou
Applied Numerical Mathematics 111 (2017) pp. 144–159. 2017.

Conference Proceedings

[1] **A type of generalization error induced by initialization in deep neural networks**
Z.-Q. J. Xu, Y. Zhang, T. Luo, Z. Ma
Submitted to NeurIPS, 2019.

[2] **Explicitizing an Implicit Bias of the Frequency Principle in Two-layer Neural Networks**
Z.-Q. J. Xu, Y. Zhang, T. Luo, Z. Ma
Submitted to NeurIPS, 2019.

[3] **Frequency Principle: Fourier Analysis Sheds Light on Deep Neural Networks**
Z.-Q. J. Xu, Y. Zhang, T. Luo, Y. Xiao, Z. Ma
Submitted to NeurIPS, 2019.

Skills

DevOps	AWS, Docker, Kubernetes, Rancher, Vagrant, Packer, Terraform, Jenkins, CircleCI
Back-end	Koa, Express, Django, REST API
Front-end	Hugo, Redux, React, HTML5, LESS, SASS
Programming	Node.js, Python, JAVA, OCaml, LaTeX
Languages	Korean, English, Japanese