CURRICULUM VITAE

Jie Du

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Education

- **Ph.D. in Mathematics**, School of Mathematical Sciences,
  University of Science and Technology of China, 09/2010 – 06/2015.
  Advisor: Professor Chi-Wang Shu and Professor Mengping Zhang
- **Visiting Ph.D. student**, Division of Applied Mathematics,
  Brown University, 08/2014 – 05/2015.
  Advisor: Professor Chi-Wang Shu
- **B.S. in Mathematics**, School of Mathematics,
  HeFei University of Technology, 09/2006 – 07/2010.

Academic Experience

- **Assistant Professor**, Yau Mathematical Sciences Center,
  Tsinghua University, 09/2017– Present.
- **Adjunct Assistant Professor**, Yanqi Lake Beijing Institute of Mathematical Sciences and Applications, 07/2021– Present.
- **Postdoctoral Fellow**, Department of Mathematics,
  The Chinese University of Hong Kong, 08/2015 – 08/2017.
  Mentor: Professor Eric T. Chung
- **Research Assistant**, Department of Civil Engineering,
  The University of Hong Kong, 07/2014 – 08/2014.
- **Research Assistant**, Department of Civil Engineering,
  The University of Hong Kong, 07/2012 – 01/2013.
- **Research Assistant**, Department of Civil Engineering,
  The University of Hong Kong, 07/2011 – 01/2012.

Research Interests

- High order numerical solutions for PDEs.
- Computational fluid dynamics.
- Modeling and numerical simulations for traffic flow problems.

List of Publications

1. J. Du and Y. Yang, *High-order bound-preserving discontinuous Galerkin methods for multicomponent chemically reacting flows*, submitted to Journal of Computational Physics.

2. H. Liang, J. Du, S.C. Wong and L. Yang, *Efficient finite-volume method on triangular meshes for solving a higher-order continuum model of pedestrian flow with consideration of panic*, submitted to Computer-Aided Civil and Infrastructure Engineering.

3. J. Du, C.-W. Shu and X. Zhong, *An improved simple WENO limiter for discontinuous Galerkin methods solving hyperbolic systems on unstructured meshes*, Journal of Computational Physics, to appear.

4. J. Du and Y. Yang, *High-order bound-preserving finite difference methods for multispecies and multireaction detonations*, Communications on Applied Mathematics and Computation, 2021.

5. J. Du, E.T. Chung and Y. Yang, *Maximum-principle-preserving local discontinuous Galerkin methods for Allen-Cahn equations*, Communications on Applied Mathematics and Computation,2021.

6. H. Liang, J. Du and S.C. Wong, *A continuum model for pedestrian flow with explicit consideration of crowd force and panic effects*, Transportation Research Part B, v149 (2021), pp. 100-117.

7. J. Du and E.T. Chung, *Mortar DG method with staggered hybridization for Rayleigh waves simulation*, Communications in Computational Physics, v29 (2021), pp.111-127.

8. J. Du and Y. Yang, *Third-order conservative sign-preserving and steady-state-preserving time integrations and applications in stiff multispecies and multireaction detonations*, Journal of Computational Physics, v395 (2019), pp.489-510.

9. J. Du, C. Wang, C. Qian and Y. Yang, *High-order bound-preserving discontinuous Galerkin methods for stiff multispecies detonation*, SIAM Journal on Scientific Computing, v41 (2019), pp.B250-B273.

10. J. Du and Y. Yang, *Maximum-principle-preserving third-order local discontinuous Galerkin method for convection-diffusion equations on overlapping meshes*, Journal of Computational Physics, v377 (2019), pp.117-141.

11. J. Du, Y. Yang and E.T. Chung, *Stability analysis and error estimates of local discontinuous Galerkin methods for convection-diffusion equations on overlapping meshes*, BIT Numerical Mathematics, v59 (2019), pp.853-876.

12. J. Du, E.T. Chung, Ming Fai Lam and Xiao-Ping Wang, *Discontinuous Galerkin method with staggered hybridization for a class of nonlinear Stokes equations*, Journal of Scientific Computing, v76 (2018), pp. 1547-1577.

13. J. Du, E.T. Chung, *An adaptive staggered discontinuous Galerkin method for the steady state convection-diffusion equation*, Journal of Scientific Computing, (2018), pp. 1-29.

14. J. Du, C.-W. Shu, *Positivity-preserving high-order schemes for conservation laws on arbitrarily distributed point clouds with a simple WENO limiter*, International Journal of Numerical Analysis and Modeling, v15 (2018), pp. 1-25.

15. E.T. Chung, J. Du and C.Y. Lam, *Discontinuous Galerkin methods with staggered hybridization for linear elastodynamics*, Computers & Mathematics with Applications, v74 (2017), pp. 1198-1214.

16. J.C. Long, W.Y. Szeto, J. Du, and R.C.P. Wong, *A dynamic taxi traffic assignment model: a two-level continuum transportation system approach*, Transportation Research Part B, v100 (2017), pp. 222-254.

17. E.T. Chung, J. Du and M.C. Yuen, *An adaptive SDG method for the Stokes system*, Journal of Scientific Computing, v70 (2017), pp. 766-792.

18. J. Du and C.-W. Shu, *A high order stable conservative method for solving hyperbolic conservation laws on arbitrarily distributed point clouds*, SIAM Journal on Scientific Computing, v38 (2016), pp. A3094-A3128.

19. J. Du, C.-W. Shu and M. Zhang, *A simple weighted essentially non-oscillatory limiter for the correction procedure via reconstruction (CPR) framework on unstructured meshes*, Applied Numerical Mathematics, v90 (2015), pp.146-167.

20. J. Du, S.C. Wong, C.-W. Shu and M. Zhang, *Reformulating the Hoogendoorn-Bovy predictive dynamic user-optimal model in continuum space with anisotropic condition*, Transportation Research Part B, v79 (2015), pp. 189-217.

21. J. Du, C.-W. Shu and M. Zhang, *A simple weighted essentially non-oscillatory limiter for the correction procedure via reconstruction (CPR) framework*, Applied Numerical Mathematics, v95 (2015), pp.173-198.

22. Y.Z. Tao, Y.Q. Jiang, J. Du, S.C. Wong, P. Zhang, Y.H. Xia and K. Choi, *Dynamic system-optimal traffic assignment for a city using the continuum modeling approach*, Journal of Advanced Transportation, v48 (2014), pp.782-797.

23. J. Du, S.C. Wong, C.-W. Shu, T. Xiong, M. Zhang and K. Choi, *Revisiting Jiang's dynamic continuum model for urban cities*, Transportation Research Part B, v56 (2013), pp.96-119.

Teaching

At Tsinghua University

- *Linear Algebra.* Instructor. Fall 2017, Fall 2018, Fall 2019, Fall 2020, Fall 2021.
- *Discontinuous Galerkin Methods.* Instructor. Spring 2018. Spring 2020. Spring 2022.
- *Numerical Methods for Partial Differential Equations.* Instructor. Spring 2019.

At The Chinese University of Hong Kong

- *Linear Algebra*. Instructor. Summer 2016.

At University of Science and Technology of China

- *Numerical Methods for Partial Differential Equations*. Teaching Assistant. Fall 2013.
- *Calculus*. Teaching Assistant. Spring 2012.
- *Computational Methods*. Teaching Assistant. Spring 2011.

Awards

- Annual Excellence Award, 2021, YMSC, Tsinghua University.
- Research Excellence Award, 2020, YMSC, Tsinghua University.
- Paper Excellence Award, 2020, YMSC, Tsinghua University.
- The Dean's Excellence Award of Chinese Academy of Sciences, 2015, University of Science and Technology of China.
- Qiu Shi Graduate Student Scholarship, 2014, University of Science and Technology of China.

Referee for Journals

- Journal of Computational Physics
- Journal of Scientific Computing
- Journal of Computational and Applied Mathematics
- International Journal of Sustainable Transportation
- Transportmetrica B: Transport Dynamics

Academic Activities

- Talk
  - International Conference on Applied Mathematics 2016, Liu Bie Ju Centre for mathematical Sciences, City University of Hong Kong, Hong Kong, May 30-June 2, 2016.
    Presentation: *An adaptive SDG method for the Stokes system.*
  - Yau Mathematical Sciences Center, Tsinghua University, Beijing, China, Mar. 31, 2017.
    Presentation: *High-order schemes for conservation laws with a simple weighted essentially non-oscillatory (WENO) limiter.*

- The Hong Kong Mathematical Society Annual General Meeting 2017, Hong Kong University of Science and Technology, Hong Kong, May 20, 2017.
  Presentation: *A high order method for solving conservation laws on arbitrarily distributed point clouds (invited talk).*
- School of Mathematical Sciences, University of Science and Technology of China, Hefei, China, Jun. 8, 2017.
  Presentation: *A high order method for solving conservation laws on arbitrarily distributed point clouds.*
- Computational & Applied Mathematics Seminar, Tsinghua University, Beijing, Oct. 10, 2017.
  Presentation: *Staggered Discontinuous Galerkin Methods for Stokes problem and elastodynamics.*
- College of Transportation Engineering, Tongji University, Shanghai, China, Jan. 07, 2018.
  Presentation: *Predictive continuum dynamic user-optimal models for urban cities.*
- The Fourth International Workshop on the Development and Application of High-order Numerical Methods, Nanjing University, May 31-June 4, 2018.
  Presentation: *Local discontinuous Galerkin methods for convection-diffusion equations on overlapped meshes.*
- International Conference on Spectral and High Order Methods, London, United Kingdom, 9-13th July, 2018.
  Presentation: *Discontinuous Galerkin Methods with Staggered Hybridization for Linear Elastodynamics.*
- Workshop on Discontinuous Galerkin Methods, Hefei, China, 22-24th Nov., 2018.
  Presentation: *Maximum-principle-preserving third-order LDG method for convection-diffusion equations on overlapping meshes.*

- Poster

  - Advanced Numerical Methods in the Mathematical Sciences, Institute for Scientific Computation, Texas A&M University, College Station, TX, USA, May 4-8, 2015.
    Poster: *A simple weighted essentially non-oscillatory (WENO) limiter for the correction procedure via reconstruction (CPR) framework on unstructured meshes.*
  - The Third International Workshop on Development and Application of High-Order Numerical Methods: in honor of Professor Chi-Wang Shu on his 60th birthday, School of Mathematical Sciences, University of Science and Technology of China, Hefei, Anhui, China, Dec. 17-19, 2016.
    Poster: *A high order stable conservative method for solving hyperbolic conservation laws on arbitrarily distributed point clouds.*

- Participant

  - The Summer Workshop on Numerical Methods of Multi-Media Hydrodynamics, Beijing Institute of Applied Physics and Computational Mathematics, Beijing, China, June 6-12, 2011.

– Computational Seismology Workshop, Tsinghua Sanya International Mathematics Forum, Sanya, Hainan, China, January 4-8, 2016.

– The 5th CAM-ICCM Workshop: Multiscale and Large-scale Scientific Computing, Department of Mathematics, The Chinese University of Hong Kong, Hong Kong, June 18-20, 2016.

– The Second International Workshop on Multimodal Transportation, Nanjing, China, June 23-24, 2018.

– The 16th SCIAM annual meeting, Chengdu, China, Sep. 13-16, 2018.

Services

- The 6th ICCM CAM Conference on Geometry and Imaging, Organizing Committee, 2017.

Computer Skills

- Programming languages: Fortran, Matlab, C.
- Experience in high performance scientific computing and in parallel computing using MPI.
- Software: working knowledge of standard business and mathematical software, including Matlab, Mathematica, Tecplot, LaTeX, etc.