

Zikang Qin

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Education

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|---|-----------------------|
| Nanjing Normal University, B.S. in Computational Mathematics | Sept 2012 – July 2017 |
| • GPA: 3.04/4.0 | |
| China Academy of Engineering Physics, M.S. in Computer Science | Sept 2018 – July 2021 |
| • Dissertation title: <i>Study on efficient methods for solving time harmonic Maxwell equation in waveguide</i> | |
| • GPA: 2.77/4.0 | |
| China Academy of Engineering Physics, Ph.D. in Computational Mathematics | Sept 2023 – July 2026 |
| • Dissertation title: <i>Study on efficient methods for discrete linear systems of structural elements in static analysis</i> | |
| • GPA: 3.40/4.0 | |

Experience

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| Software Engineer, CETC 38th Research Institute – Hefei, Anhui Province | Aug 2021 – Aug 2022 |
| • Integrated Kalman filter modules into the ReWorks embedded system platform for real-time radar track data processing | |
| Software Engineer, Universaland – Hefei, Anhui Province | Oct 2022 – Aug 2023 |
| • Developed an adaptive network adjustment module for a GNSS high-precision positioning software | |
| • Improved positioning precision by 10%–15% | |

Research Projects

Efficient Methods for Solving Time-Harmonic Maxwell Equations in SiP Applications

- Designed a **multigrid** preconditioner based on shifted relative permittivity
- Developed an **MPI-based distributed parallel solver**, achieving favorable numerical performance
- Tools Used: C, MPICH, PETSc

Efficient Methods for Solving Structural Element Discrete Linear Systems in Static Analysis

- Developed a **parallel graph-partitioning multigrid coarsening module** using ParMETIS
- Constructed **multigrid interpolation operators** based on rigid body modes and Kirchhoff theory
- Designed an **MPI-based distributed parallel aggregation-based multigrid preconditioner**, significantly improving static structural simulation efficiency
- Tools Used: C, MPICH, ParMETIS, PETSc

Publications

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| CSCMO: Relative Permittivity-Based Complex Shifted Operator Preconditioning Method for Solving Time-Harmonic Maxwell Equations | Aug 2025 |
| Zikang Qin, Xiaoyu Duan, Hengbin An, etc | |
| Applied Numerical Mathematics, 10.1016/j.apnum.2025.08.009 | |
| Comparison of Two Methods for Accelerating Convergence of Vector Sequences | Dec 2021 |
| Zikang Qin, Hengbin An, Xinyu Wang | |
| Journal on Numerical Methods and Computer Applications, 10.12288/szjs.s2020-0704 | |

Professional Skills

Programming: C, Python, MATLAB
Parallel Computing: MPI, PETSc, AMGX, Hypre, MUMPS
Languages: English (proficient), Chinese (native)

Honors & Awards

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| Chinese College Students Math Competition, Second Prize | Nov 2014 |
| Chinese College Students Math Competition, Third Prize | Nov 2015 |
| NNU Mathematical Contest in Modeling, First Prize | May 2015 |