Calvin Wong

Department of Mathematics
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EDUCATION

Ph.D. Mathematics, University of Tennessee Knoxville, Expected 2027

M.S. Mathematics, University of Tennessee Knoxville, 2024

B.S. Mathematics (Computational and Applied Mathematics, Enrichment Mathematics), First Class Honour, The Chinese University of Hong Kong, 2022

APPOINTMENTS

2025 Oak Ridge National Lab
Summer Internship Scientist

2024 Oak Ridge National Lab
Summer Internship Scientist

2022– University of Tennessee, Knoxville
Graduate Teaching Assistant, 2022 – 2023
Graduate Teaching Associate, 2023 –
Graduate Research Assistant, 2023 –

2021–2022 The Chinese University of Hong Kong
Undergraduate Researcher, Undergraduate Research Opportunity Program, 2021 – 2022

RESEARCH AREAS

Numerical Methods and Analysis, Numerical PDE and Modelling

Diffuse Domain Methods, Multigrid Methods

Graph Neural Network, Reinforcement Learning, Statistical Mechanics

Mathematical (Medical) Imaging, Computational Differential and Quasiconformal Geometry

RESEARCH EXPERIENCE

2024- Combinatorical Optimization with Graph Convolutional Network and Deep Reinforcement Learning

- Supervised by Prof. Cory Hauck,
  Oak Ridge National Lab (ORNL) and University of Tennessee, Knoxville
- Investigating on the design and optimization of synthesized crystal via graph convolutional network and deep reinforcement learning

- Reviewing related research on nuclear power plant assembly and coding out the simulations and networks

2022- Diffuse Domain Method on Solving Poisson PDE with Finite Difference and Finite Element Method

- Co-supervised by Prof. Steven Wise and Prof. Tadele Mengesha, University of Tennessee Knoxville
- Investigating on the behavior of the solution inside and outside a domain with complex geometry
- Studying the asymptotic behavior of the numerical solution and Gamma Convergence of the method

2022 High-dimensional Numerical Integration Problems using Multilevel Dimensional Iteration Methods

- NSF funded summer research supervised by Prof. Feng Xiaobing, University of Tennessee Knoxville
- Performed dimension reduction on high dimensional integration problem via co-area formula and Lebesgue measure
- Conducted numerical experiment on the proposed methods

2021 Detecting Defects of Pavement with Mathematical Imaging

- Supervised by Prof. Ronald Lui, The Chinese University of Hong Kong
- Detecting potholes by analysing the curvatures and Beltrami coefficient at each point of the pavement
- Detecting cracks by analysing the high frequency component of the Fourier coefficients
- Image denoising with Total Variational Method and Gaussian Smoothing
- Led and coordinated a team of 6 undergraduate and full time researchers

2021 Developing Classification Model on Childhood Obstructive Sleeping Apnea with Machine Learning, Differential Geometry and Quasiconformal Geometry

- Supervised by Prof. Ronald Lui, The Chinese University of Hong Kong
- Led and coordinated a team of 3 undergraduate researchers
- Developed a classification model for early-stage diagnosis of Childhood Obstructive Sleep Apnea by reconstructing 3D face models from 2D images taken by smartphone, achieving high diagnostic accuracy
- Presented research findings to an academic audience of 100, fostering interactive Q&A sessions

2019 Mathematical Proof Judge with Natural Language Processing

- Supervised by Dr. Cheung Leung Fu and Dr. Chan Ping Shun, The Chinese University of Hong Kong
- Carried research on implementations of AI-driven math proof judging systems
- Presented basic algorithms and prototype to judge some basic standardized problems

PUBLICATIONS

Books

2025 S. M. Wise, A. J. Salgado, and M. H. Wong. "*Multigrid Methods*: Axiomatic Convergence Theory for Linear and Weakly Nonlinear Problems." De Gruyter Textbook, De Gruyter Brill, Berlin, forthcoming 2025. ISBN 978-3-11-135488-0.
`https://www.degruyterbrill.com/document/isbn/9783111354880/html`

Journal Articles

2025 T. Luong, T. Mengesha, S. M. Wise, and M. H. Wong. "A Diffuse Domain Approximation with Transmission-Type Boundary Conditions II: Gamma–Convergence." *International Journal of Numerical Analysis and Modeling*, 22(5): 728–744, 2025.
`https://doi.org/10.4208/ijnam2025-1031`

2025 T. Luong, T. Mengesha, S. M. Wise, and M. H. Wong. "A Diffuse Domain Approximation with Transmission-Type Boundary Conditions I: Asymptotic Analysis and Numerics." *International Journal of Numerical Analysis and Modeling*, 22(5): 694–727, 2025.
`https://doi.org/10.4208/ijnam2025-1030`

2023 M.-H. Wong, M. Li, K.-M. Tam, H.-M. Yuen, C.-T. Au, K. C.-C. Chan, A. M. Li, and L.-M. Lui. "A Quasiconformal-Based Geometric Model for Craniofacial Analysis and Its Application." *Axioms*, 12(4): 393, 2023. `https://doi.org/10.3390/axioms12040393`

Campus Talks

2022 "Preliminary Diagnosis of Childhood Obstructive Sleep Apnea using 2D Images by Quasi-Conformal Geometry." Undergraduate Research Opportunity Program 2021 Workshop. The Chinese University of Hong Kong

CONFERENCE

2025 UARK–SIAM–CSS 2025 Conference, University of Arkansas, Fayetteville, AR
Invited Talk: "Gamma-Convergence and Asymptotic Analysis for a Diffuse Domain Problem with Transmission Boundary Conditions: Part 2, Numerical Confirmation"

2025 SIAM SEAS 2025, March 2025
Invited Talk: "Gamma-Convergence and Asymptotic Analysis for a Diffuse Domain Problem with Transmission Boundary Conditions: Part 2, Numerical Confirmation"

2024 Workshop on Theoretical and Numerical Challenges in Materials Science, The University of Alabama

COURSES TAUGHT

University of Tennessee, Knoxville

2026 Calculus II (as teaching assistant)

2025 Finite Mathematics (as teaching assistant)

2025 Mathematics for the life sciences (as instructor of record)

2024 ODE I (as teaching assistant)

2024 Multigrid Method (as teaching assistant)

2024 Calculus II (as teaching assistant)

2023 Basic Calculus (as instructor of record)

2023 Finite Mathematics (as teaching assistant)

2022 College Algebra (as teaching assistant)

The Chinese University of Hong Kong

2022 Science Academy for Young Talent: A Trilogy of Hands-on Machine Learning (as teaching assistant)

2021 Enrichment Programme for Young Mathematics Talent: Introduction to Discrete Mathematics (as teaching assistant)

2020 Enrichment Programme for Young Mathematics Talent: Towards Differential Geometry (as teaching assistant)

2019 Enrichment Programme for Young Mathematics Talent: Towards Modern Algebra (as teaching assistant)

GRANTS AND AWARDS

Awards, Scholarships and Fellowship

2025 Dawn and Lawrence Taylor Graduate Fellowship, University of Tennessee, Knoxville

2025 Dorothea & Edgar D. Eaves Graduate Student Teaching Award: Senior, University of Tennessee, Knoxville

2022 Department of Mathematics Fellowship, University of Tennessee, Knoxville

2022 Undergraduate Research Opportunity Program Gold Award, The Chinese University of Hong Kong

2022 Chung Chi College Departmental Prize - Enrichment Mathematics, The Chinese University of Hong Kong

2021 Chung Chi College Scholarship for Excellence, The Chinese University of Hong Kong

2019 Dr Chao Yung Chi-hsing Scholarship in Mathematics 2019/20

2017-2022 Faculty of Science Dean's List, The Chinese University of Hong Kong (5 time awardee)

2017-2022 Chung Chi College Kunkle and Pommerenke Full Tuition Scholarship, The Chinese University of Hong Kong (3 time awardee)

2017-2022 Undergraduate Mathematics Scholarship, Department of Mathematics, The Chinese University of Hong Kong (5 time awardee)

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