

Ka Wai (Karry) Wong

About me

I am an applied mathematician with passion in software engineering & data science. I am currently a postdoctoral researcher at a US national laboratory. My [work](#) is on 3D geometry modelling for nuclear fusion experiment. My PhD in computational geometry was to develop fast algorithms for conformal maps, see [GitHub](#). I also have intern experience in developing commercial CAD software. I've excellent communication skills with extensive intercultural experience from Germany, Israel, and Hong Kong.

Programming Languages

- Python 1+ years; I used [pytest](#) and the class-based object-oriented programming approach to write automated unit tests for WiFi in different IP scenarios.
- C/C++ 3+ years; I used the mesh data structure library [OpenMesh](#), linear algebra libraries [Eigen](#) and [CHOLMOD](#), and parallel computing [OpenMP](#) in developing fast algorithms in computational geometry.
- MATLAB 5+ years; I generalized the use of [Algebraic Iterative Reconstruction Toolbox](#) to reconstruct 3D nuclear fusion hotspot. I also developed multigrid solver and iterative solver (GMRES) in numerical algebra.
- R 6 months; used VGAM and `ivreg` for linear and instrumental variable regressions
- Fortran 3 months; constructed a [2D Laplace solver](#) using algebra libraries BLAS and LAPACK

Professional Experience

- Since Oct. 2021 **Postdoctoral researcher**, *Lawrence Livermore Natl Laboratory*, Livermore, California.
I am a recipient of the [postdoctoral fellowship in high energy density science](#) in the year 2021,
◦ Working on x-ray diagnostics (penumbral imaging) development and computed tomography of x-ray images at the National Ignition Facility; also exploring data-driven approaches such as Bayesian inference in experimental data analysis
- Jun. - Sept. 2021 **Software Engineer Intern**, *Autodesk*, San Francisco, California.
◦ Worked on new [additive manufacturing features](#) for CAD tool [Fusion360](#); solved 3D geometry problems of shapes defined by implicit modeling and B-rep
- Dec. 2019 - Jun. 2021 **Graduate Student Researcher**, *Lawrence Livermore Natl Lab*.
◦ Developed algorithms in MATLAB that performs 3D reconstructions of x-ray emission distributions from very limited 2D projections; 3-minute SLAM talk on [Youtube](#)
◦ conducted errors quantification and data analysis of x-ray pinhole and penumbral images
- Jul. - Sept. 2019 **Software Engineer Intern**, *Rohde & Schwarz USA*, Beaverton, Oregon.
◦ Wrote automated test cases for different IP configurations and WLAN 802.11 standards
- Summers 2017/18/19 **Graduate Student Researcher**, *Center for Educational Effectiveness*, UC Davis.
My aspiration and impact were to help minority groups to achieve academic success.
◦ Analyzed 5,000+ data of students with social disadvantages and assessed the impact of remedial learning using online learning software ALEKS on student performance.

Livermore, California

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- Apr. - Sept. **Software Testing Engineer**, *Rohde & Schwarz GmbH & Co. KG.*, Munich, Germany.
2016 ○ Defined and implemented automated unit test cases for R&S®CMW500 Callbox;
- Mar. - May. **Intern**, *Siemens AG Corporate Technology*, Munich, Germany.
2014 ○ Developed a multigrid solver using finite element discretization to solve differential equations;

Languages

Fluent – English, German, Mandarin; Native – Cantonese; Conversational – Hebrew

Education

- 2016–2021 **Ph.D. Applied Mathematics (GPA: 3.9)**, *University of California, Davis*.
2011–2015 **M.Sc. Mathematics**, *The Technical University of Munich*, Germany.
2014–2015 **Visiting Scholar**, *The Hebrew University of Jerusalem*, Israel.
2012–2013 **Academic Exchange**, *Technion – Israel Institute of Technology*, Israel.
2008–2011 **B.Sc. Mathematics (1st Hons.)**, *Hong Kong University of Science & Technology*.

Publications & Presentations

- [1] KW Wong; B Bachmann. *3D x-ray emission tomography and electron temperature measurement of inertial confinement fusion hotspots*. ongoing revision, 2021.
- [2] KW Wong. *Conformal parametrization of surfaces of genus zero and 3d reconstruction of nuclear fusion hotspots*, Dissertation at UC Davis and LLNL, Dec 2020.
- [3] KW Wong. *3-D electron temperature and x-ray emission tomography of the icf hotspot at the national ignition facility*, Poster at APS DPP meeting, Nov 2020.
- [4] KW Wong. *Application of mean curvature flow for surface parametrizations*. Proceedings of the John H. Barrett Memorial Lectures held at the University of Tennessee, Knoxville, May 29-June 1, 2018.
- [5] KW Wong. *Optimal isometric embeddings of surfaces in 3-dimensional spaces*, Master's thesis at TU Munich and Hebrew University, 2015.

Projects in Progress

- From Nov 20* Machine Learning (TensorFlow & PyTorch) learnt on Coursera and practiced on Kaggle
- From Oct 21* [My Leetcode account](#) - 85 easy, 115 medium, and 8 hard problems solved; badge "Data Structure I" earned on Nov 16th, 2021; my own solutions maintained and updated in [GitHub repository](#)

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