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, working work on 3D geometry modelling and data-driven analysis for nuclear fusion experiments. 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 united 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
- 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

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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.

Apr. - Sept. 2016 **Software Testing Engineer**, *Rohde & Schwarz GmbH & Co. KG.*, Munich, Germany.
- Defined and implemented automated unit test cases for R&S®CMW500 Callbox;

Mar. - May. 2014 **Intern**, *Siemens AG Corporate Technology*, Munich, Germany.
- 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 Math (GPA: 3.9)**, *University of California, Davis*, graduated in Sept.

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 - 243 problems solved (89 easy, 143 medium, and 11 hard); badges "Algorithm II" and "Data Structure I" earned; my own solutions maintained and updated in GitHub repository

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