Ka Wai (Karry) Wong

About me

My PhD is in applied mathematics and my passion lies in software engineering & data science. I can graduate any time in 2021. My doctoral research on computational differential geometry is to develop fast algorithms for conformal maps, see my C++ code at GitHub. I've been doing research in x-ray imaging and computed tomography problems related to nuclear fusion at the Lawrence Livermore National Laboratory.

Programming Languages

Python	3+ 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 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	1 year; used `VGAM` in simple linear regression, `ivreg` in instrumental variable regression
TensorFlow	3 months (ongoing); Basics in machine learning, courses on Deep Learning at Coursera
From Dec 20	I've been practicing Leetcode intensively, progress documented at my GitHub repository

Professional Experience

Dec. 2019 - Mar. 2021 — **Graduate Researcher**, *National Ignition Facility, Lawrence Livermore Natl Lab*.
- I developed algorithms in MATLAB that performs 3D reconstructions of x-ray emission distributions from very limited 2D projections and uses reconstructions to measure nuclear fusion plasma temperature; 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.
I was enthusiastic to get to know the 5G development mainly in Wi-Fi and WLAN technologies
- Wrote automated test cases for IP configurations with different 802.11 standards.
- Coded in Python (pytest), practiced with IBM Rational Team Concert and SCRUM.

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.
Specialized in automated testing for wireless communications with 4G technologies (LTE)
- Defined and implemented automated unit test cases for R&S®CMW500 Callbox;

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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 Mathematics (GPA: 3.9)**, *UC Davis, expected graduation 2021.*

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 and Presentations

[1] Ka Wai Wong. *conformal parametrization of surfaces of genus zero and 3d reconstruction of nuclear fusion hotspots*, Dissertation at UC Davis, submitted.

[2] Ka Wai 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.

[3] Ka Wai 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.

[4] Ka Wai Wong and Benjamin Bachmann. *3D x-ray emission tomography and electron temperature measurement of inertial confinement fusion hotspots*. in preparation.

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