Ka Wai (Karry) Wong

About me

Currently I'm an active learner of machine learning and data science. My PhD research is computational geometry with focus on algorithm design. I developed a fast and robust algorithm which uses the mean curvature flow to map a surface conformally onto a unit sphere, see my C++ code at GitHub. I've been working on x-ray image analysis and computed tomography of nuclear fusion hotspot. In my free time, I am an avid world traveler and passionate about learning different languages.

Education

2016–2021 **Ph.D. Applied Mathematics (GPA: 3.9)**, *UC Davis, expected graduation Mar 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.*

Programming Languages

Python 3+ years; object-oriented programming & pytest in software testing

C/C++ 3+ years; Parallel computing: OpenMP; Libraries in linear algebra: Eigen, CHOLMOD

MATLAB 5+ years; Geometric flows, mesh generation, multigrid, iterative solvers (e.g.GMRES)

R 1 year; used `VGAM` in simple linear regression, `ivreg` in instrumental variable regression

Pytorch 3 months (ongoing); Basics in machine learning, courses on Deep Learning at Coursera

Professional Experience

Dec. 2019 - Mar. 2021 **Research Intern**, *National Ignition Facility, Lawrence Livermore National Laboratory.*

- I developed algorithms in MATLAB that performs 3D reconstructions of x-ray emission distributions from very limited 2D projections and uses reconstructions to measure nulcear fusion plasma temperature, and
- conducted errors quantification and data analysis of x-ray pinhole and penumbral images

A 3-minute overview in Summer SLAM on Youtube

Jul. - Sept. 2019 **Intern on WiFi in 5G**, *Rohde & Schwarz USA*, Beaverton, Oregon.

I was enthusiastic to get to know the 5G development, mainly Wi-Fi 6 and WLAN technologies

- Wrote automated test cases for IP configurations with different 802.11 standards.
- Coded in Python, practised with IBM Rational Team Concert, and worked within 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.

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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 test cases for new features of R&S®CMW500 Callbox;
Coded in Python and practised with bugtracker Bugzilla and IBM ClearCase.

Mar.–May. 2014 **Intern**, *Siemens AG Corporate Technology*, Munich, Germany.
- Developed a multigrid solver using finite element discretizations to solve differential equations;
Coded in MATLAB, Simulink and C++ (Visual Studio Microsoft).

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.

Languages

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

Certificates & Awards

2020 **SPOT award**, *Physical and Life Science Directorate*, LLNL.
This award is testament to the oustanding contributions, exceptional creativity, and extraordinary productivity I demonstrated in my internship project.

2020 **Outstanding Graduate Student Teaching Award**, UC Davis.
This award recognizes excellence in teaching by graduate students. The selection process is highly competitive and I was chosen out of 2,000 teaching assistants across campus.

2018 **William Karl Schwarze Mathematics Scholarship ($4,500)**, UC Davis.
For outstanding mathematical scholarship and exceptional promise of making a strong professional contribution as a mathematics educator at the pre-college or college level.

References

1. Prof. Joel Hass (Thesis advisor, Mathematics, UC Davis), hass@math.ucdavis.edu
2. Prof. Patrice Koehl (Thesis co-advisor, Computer Science, UC Davis), koehl@cs.ucdavis.edu
3. Dr. Benjamin Bachmann (Mentor, LLNL), bachmann2@llnl.gov
4. Dr. Alex Zylstra (Experimental physicist, LLNL), zylstra1@llnl.gov
5. Mr. David Connolly (Team lead, Rohde & Schwarz), david.connolly@rsa.rohde-schwarz.com

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