

Ka Wai Wong

About me

I am a passionate believer in computer algorithms and an active learner of machine learning and data science. My PhD research lies in computational geometry with focus on shape analysis. My project is to apply the mean curvature flow to map a 2D surface onto a unit sphere conformally and I have developed a fast and robust algorithm to obtain such a conformal map. The code is in C++ with mesh data structure OpenMesh. Currently, I am working on image analysis of ICF implosions at LLNL and 3D hotspot reconstruction via computer tomography.

Education

- 2016–2020 **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 2+ years; object-oriented programming & pytest in software testing
- C/C++ 2+ years; Parallel computing: OpenMP; Libraries in linear algebra: Eigen, CHOLMOD
- MATLAB 4+ 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

Languages

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

Professional Experience

- Dec. 2019 - **Research Intern**, *National Ignition Facility, Lawrence Livermore National Laboratory.*
- Mar. 2021 I am thrilled to work in high-energy-density physics and the diagnostics of nuclear fusion research. My research project is to develop algorithms for image analysis using MATLAB that
 - performs 3D reconstructions of X-ray emission distributions from very limited 2D projections and uses reconstructions to measure thermonuclear plasma properties e.g. temperature
 - conducts errors and uncertainties quantification in 3D reconstructions and data analysis of pinhole and penumbral images
- Jul. - Sept. **Intern on WiFi in 5G**, *Rohde & Schwarz USA, Beaverton, Oregon.*
- 2019 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.

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- Summers **Graduate Student Researcher**, *Center for Educational Effectiveness*, UC Davis.
2017/18/19 My aspiration and impact were to help minority group 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. **Software Testing Engineer**, *Rohde & Schwarz GmbH & Co. KG.*, Munich, Germany.
2016 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. **Intern**, *Siemens AG Corporate Technology*, Munich, Germany.
2014 ○ Developed a multigrid solver using finite element discretizations to solve differential equations;
Coded in MATLAB, Simulink and C++ (Visual Studio Microsoft).

Publications

- [1] 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.

Certificates & Awards

- 2020 **SPOT award**, *Physical and Life Science Directorate*, LLNL.
This award is testament to the outstanding 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.

Personal Information

- Date of Birth September 25th, 1990; British Hong Kong
Citizenships Portuguese and British (Oversea) *F-1 visa expired on June 2021, OPT not yet used*

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, Lawrence Livermore National Laboratory)
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4. Mr. David Connolly (Team lead of Stack Development, Rohde & Schwarz USA)
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