

Gary Pui Tung CHOI

Department of Mathematics, The Chinese University of Hong Kong

PERSONAL INFORMATION

Address: Room 204, Lady Shaw Building, The Chinese University of Hong Kong, Shatin, N.T.,
Hong Kong
Tel: (+852) 3943-5481
Email: ptchoi@cuhk.edu.hk / ptchoi@math.cuhk.edu.hk
Website: <https://www.math.cuhk.edu.hk/~ptchoi>
ORCID: 0000-0001-5407-9111

EMPLOYMENT

- The Chinese University of Hong Kong**, Hong Kong
▪ Vice-Chancellor Assistant Professor, Department of Mathematics 2023–Present
- Massachusetts Institute of Technology**, Cambridge, MA, USA
▪ NSF Postdoctoral Fellow and Instructor in Applied Mathematics 2020–2023
• Sponsoring Scientist: Jörn Dunkel

EDUCATION

- Harvard University**, Cambridge, MA, USA
▪ Ph.D. in Applied Mathematics 2016–2020
• Advisors: L. Mahadevan FRS and Chris Rycroft
• Dissertation: “Metamaterials, Morphometrics, Morphogenesis, and Mappings”
- S.M. in Applied Mathematics 2019
- The Chinese University of Hong Kong**, Hong Kong
▪ M.Phil. in Mathematics 2014–2016
• Advisor: Ronald Lok Ming Lui
• Thesis: “Surface Conformal/Quasi-conformal Parameterization with Applications”
(with 2017 New World Mathematics Award, Silver Medal for Master Thesis)
- B.Sc. in Mathematics (First Class Honors) 2010–2014
• Streams: Enrichment Stream in Mathematics, Computational and Applied Mathematics Stream
• Minors: Computer Science, Earth System Science

RESEARCH INTERESTS

Applied and Computational Geometry, Interdisciplinary Mathematical Modeling, Mechanical Metamaterials, Quantitative Biology, Medical Imaging, Geometry Processing, Scientific Computing

PUBLICATIONS

(*:equal contribution; †:corresponding author)

PREPRINT/SUBMITTED

- [49] Z. Lyu, L. M. Lui, [G. P. T. Choi](#)[†], “[Spherical density-equalizing map for genus-0 closed surfaces](#),” submitted, arXiv:2401.11795.
- [48] G. Notomista, [G. P. T. Choi](#), M. Saveriano, “Reactive robot navigation using quasi-conformal mappings and control barrier functions,” submitted.
- [47] M. Shaqfa, [G. P. T. Choi](#), G. Anciaux, K. Beyer, “[Disk harmonics for analysing curved and flat self-affine rough surfaces and the topological reconstruction of open surfaces](#),” submitted, arXiv:2403.07001.

ACCEPTED/PUBLISHED

- [46] T. Ohmura, D. J. Skinner, K. Neuhaus, [G. P. T. Choi](#), J. Dunkel, K. Drescher, “[In vivo microrheology reveals local elastic and plastic responses inside three-dimensional bacterial biofilms](#),” *Advanced Materials*, 2314059 (2024).
- [45] [G. P. T. Choi](#)[†], “[Fast ellipsoidal conformal and quasi-conformal parameterization of genus-0 closed surfaces](#),” *Journal of Computational and Applied Mathematics*, 447, 115888 (2024).
- [44] Z. Lyu, [G. P. T. Choi](#), L. M. Lui, “[Bijective density-equalizing quasiconformal map for multiply connected open surfaces](#),” *SIAM Journal on Imaging Sciences*, 17(1), 706–755 (2024).

- [43] S. Mosleh*, G. P. T. Choi*, G. M. Musser, H. F. James, A. Abzhanov, L. Mahadevan, “**Beak morphometry and morphogenesis across avian radiations**,” *Proceedings of the Royal Society B*, 290(2007), 20230420 (2023).
- [42] Y. Guo, Q. Chen, G. P. T. Choi, L. M. Lui, “**Automatic landmark detection and registration of brain cortical surfaces via quasi-conformal geometry and convolutional neural networks**,” *Computers in Biology and Medicine*, 163, 107185 (2023).
- [41] L. H. Dudte*, G. P. T. Choi*, K. P. Becker, L. Mahadevan, “**An additive framework for kirigami design**,” *Nature Computational Science*, 3(5), 443–454 (2023).
 - Featured in media outlets including [Nature Computational Science News & Views](#), [MIT News](#), [News 8 Plus](#), [Mirage News](#), and [Tech Xplore](#).
- [40] G. P. T. Choi, L. Liu, L. Mahadevan, “**Explosive rigidity percolation in kirigami**,” *Proceedings of the Royal Society A*, 479(2271), 20220798 (2023).
- [39] G. P. T. Choi, L. M. Lui, “**Recent developments of surface parameterization methods using quasi-conformal geometry**,” *Handbook of Mathematical Models and Algorithms in Computer Vision and Imaging*, Springer, Cham, 1483–1523 (2023).
- [38] T. Dixit, G. P. T. Choi*, S. Al-Mosleh*, J. Lund, J. Troscianko, C. Moya, L. Mahadevan, C. N. Spottiswoode, “**Combined measures of mimetic fidelity explain imperfect mimicry in a brood parasite-host system**,” *Biology Letters*, 19(2), 20220538 (2023).
- [37] R. Supekar, B. Song, A. Hastewell, G. P. T. Choi, A. Mietke, J. Dunkel, “**Learning hydrodynamic equations for active matter from particle simulations and experiments**,” *Proceedings of the National Academy of Sciences*, 120, e2206994120 (2023).
- [36] Z. Zhu, G. P. T. Choi, L. M. Lui, “**Parallelizable global quasi-conformal parameterization of multiply connected surfaces via partial welding**,” *SIAM Journal on Imaging Sciences*, 15(4), 1765–1807 (2022).
- [35] L. Liu*, G. P. T. Choi*, L. Mahadevan, “**Quasicrystal kirigami**,” *Physical Review Research*, 4(3), 033114 (2022).
 - Selected as Editors’ Suggestion.
- [34] S. Chen, F. Giardina, G. P. T. Choi, L. Mahadevan, “**Modular representation and control of floppy networks**,” *Proceedings of the Royal Society A*, 478(2264), 20220082 (2022).
- [33] G. P. T. Choi[†], A. Giri, L. Kumar, “**Adaptive area-preserving parameterization of open and closed anatomical surfaces**,” *Computers in Biology and Medicine*, 148, 105715 (2022).
- [32] D. Zhang, G. P. T. Choi, J. Zhang, L. M. Lui, “**A unifying framework for n -dimensional quasi-conformal mappings**,” *SIAM Journal on Imaging Sciences*, 15(2), 960–988 (2022).
- [31] H. Law, G. P. T. Choi, K. C. Lam, L. M. Lui, “**Quasiconformal model with CNN features for large deformation image registration**,” *Inverse Problems and Imaging*, 16(4), 1019–1046 (2022).
- [30] G. P. T. Choi, Y. Liu, L. M. Lui, “**Free-boundary conformal parameterization of point clouds**,” *Journal of Scientific Computing*, 90(1), 14 (2022).
- [29] S. Al-Mosleh, G. P. T. Choi, A. Abzhanov, L. Mahadevan, “**Geometry and dynamics link form, function and evolution of finch beaks**,” *Proceedings of the National Academy of Sciences*, 118(46), e2105957118 (2021).
 - Featured in [Harvard SEAS News](#).
- [28] G. P. T. Choi, L. H. Dudte, L. Mahadevan, “**Compact reconfigurable kirigami**,” *Physical Review Research*, 3(4), 043030 (2021).
- [27] M. Shaqfa, G. P. T. Choi, K. Beyer, “**Spherical cap harmonic analysis (SCHA) for characterising the morphology of rough surface patches**,” *Powder Technology*, 393, 837–856 (2021).
- [26] L. Liu*, G. P. T. Choi*, L. Mahadevan, “**Wallpaper group kirigami**,” *Proceedings of the Royal Society A*, 477(2252), 20210161 (2021).
- [25] B. Jarvis, G. P. T. Choi, B. Hockman, B. Morrell, S. Bandopadhyay, D. Lubey, J. Villa, S. Bhaskaran, D. Bayard, I. A. Nesnas, “**3D shape reconstruction of small bodies from sparse features**,” *IEEE Robotics and Automation Letters*, 6(4), 7089–7096 (2021).

- [24] M. B. Edwards, G. P. T. Choi, N. J. Derieg, Y. Min, A. C. Diana, S. A. Hodges, L. Mahadevan, E. M. Kramer, E. S. Ballerini, “Genetic architecture of floral traits in bee- and hummingbird-pollinated sister species of *Aquilegia* (columbine),” *Evolution*, 75(9), 2197–2216 (2021).
- [23] L. H. Dudte, G. P. T. Choi, L. Mahadevan, “An additive algorithm for origami design,” *Proceedings of the National Academy of Sciences*, 118(21), e2019241118 (2021).
- [22] G. P. T. Choi[†], “Efficient conformal parameterization of multiply-connected surfaces using quasi-conformal theory,” *Journal of Scientific Computing*, 87(3), 70 (2021).
- [21] G. P. T. Choi[†], C. H. Rycroft, “Volumetric density-equalizing reference map with applications,” *Journal of Scientific Computing*, 86(3), 41 (2021).
- [20] A. Giri*, G. P. T. Choi*[†], L. Kumar, “Open and closed anatomical surface description via hemispherical area-preserving map,” *Signal Processing*, 180, 107867 (2021).
- [19] G. P. T. Choi, S. Chen, L. Mahadevan, “Control of connectivity and rigidity in prismatic assemblies,” *Proceedings of the Royal Society A*, 476(2244), 20200485 (2020).
- [18] G. P. T. Choi, D. Qiu, L. M. Lui, “Shape analysis via inconsistent surface registration,” *Proceedings of the Royal Society A*, 476(2242), 20200147 (2020).
- [17] A. Chakrabarti, G. P. T. Choi, L. Mahadevan, “Self-excited motions of volatile drops on swellable sheets,” *Physical Review Letters*, 124(25), 258002 (2020).
 - Featured in media outlets including Harvard SEAS News, Phys.org, Tech Explorist, and N+1 (in Russian).
- [16] G. P. T. Choi, Y. Leung-Liu, X. Gu, L. M. Lui, “Parallelizable global conformal parameterization of simply-connected surfaces via partial welding,” *SIAM Journal on Imaging Sciences*, 13(3), 1049–1083 (2020).
- [15] S. Chen*, G. P. T. Choi*, L. Mahadevan, “Deterministic and stochastic control of kirigami topology,” *Proceedings of the National Academy of Sciences*, 117(9), 4511–4517 (2020).
- [14] G. P. T. Choi[†], B. Chiu, C. H. Rycroft, “Area-preserving mapping of 3D carotid ultrasound images using density-equalizing reference map,” *IEEE Transactions on Biomedical Engineering*, 67(9), 1507–1517 (2020).
- [13] G. P. T. Choi, H. L. Chan, R. Yong, S. Ranjitkar, A. Brook, G. Townsend, K. Chen, L. M. Lui, “Tooth morphometry using quasi-conformal theory,” *Pattern Recognition*, 99, 107064 (2020).
- [12] A. Pumarola, J. Sanchez-Riera, G. P. T. Choi, A. Sanfeliu, F. Moreno-Noguer, “3DPeople: Modeling the geometry of dressed humans,” *Proceedings of the IEEE International Conference on Computer Vision (ICCV)*, 2242–2251 (2019).
 - Featured in media outlets including AI³ | Theory, Practice, Business and Synced.
- [11] G. P. T. Choi, L. H. Dudte, L. Mahadevan, “Programming shape using kirigami tessellations,” *Nature Materials*, 18, 999–1004 (2019).
 - Featured on the cover and in media outlets including Harvard SEAS News, Science Daily, Interesting Engineering, Phys.org, Index Hungary (in Hungarian), fabcross (in Japanese), Asahi Shimbun (in Japanese), and Popular Mechanics.
- [10] G. P. T. Choi, L. Mahadevan, “Planar morphometrics using Teichmüller maps,” *Proceedings of the Royal Society A*, 474(2217), 20170905 (2018).
- [9] C. P. Yung, G. P. T. Choi, K. Chen, L. M. Lui, “Efficient feature-based image registration by mapping sparsified surfaces,” *Journal of Visual Communication and Image Representation*, 55, 561–571 (2018).
- [8] G. P. T. Choi[†], C. H. Rycroft, “Density-equalizing maps for simply connected open surfaces,” *SIAM Journal on Imaging Sciences*, 11(2), 1134–1178 (2018).
- [7] G. P. T. Choi, L. M. Lui, “A linear formulation for disk conformal parameterization of simply-connected open surfaces,” *Advances in Computational Mathematics*, 44(1), 87–114 (2018).
- [6] G. P. T. Choi, Y. Chen, L. M. Lui, B. Chiu, “Conformal mapping of carotid vessel wall and plaque thickness measured from 3D ultrasound images,” *Medical & Biological Engineering & Computing*, 55(12), 2183–2195 (2017).
- [5] G. P. T. Choi, M. H. Y. Man, L. M. Lui, “Fast spherical quasiconformal parameterization of genus-0 closed surfaces with application to adaptive remeshing,” *Geometry, Imaging and Computing*, 3(1–2), 1–29 (2016).

- [4] T. W. Meng, G. P. T. Choi, L. M. Lui, “**TEMPO: Feature-endowed Teichmüller extremal mappings of point clouds**,” *SIAM Journal on Imaging Sciences*, 9(4), 1922–1962 (2016).
- [3] G. P. T. Choi, K. T. Ho, L. M. Lui, “**Spherical conformal parameterization of genus-0 point clouds for meshing**,” *SIAM Journal on Imaging Sciences*, 9(4), 1582–1618 (2016).
- [2] P. T. Choi, L. M. Lui, “**Fast disk conformal parameterization of simply-connected open surfaces**,” *Journal of Scientific Computing*, 65(3), 1065–1090 (2015).
- [1] P. T. Choi, K. C. Lam, L. M. Lui, “**FLASH: Fast landmark aligned spherical harmonic parameterization for genus-0 closed brain surfaces**,” *SIAM Journal on Imaging Sciences*, 8(1), 67–94 (2015).

RESEARCH FUNDING	<ul style="list-style-type: none"> ▪ (PI) CUHK Faculty of Science Direct Grant for Research (HK\$150,000) ▪ (PI) CUHK Research Data Management Development Fund (HK\$100,000) ▪ (PI) Croucher Foundation Start-up Allowance (HK\$500,000) ▪ (PI) CUHK VC Early Career Professorship Startup Fund (HK\$2,000,000) ▪ (Co-I) HKRGC General Research Fund #14306723 (HK\$877,079) ▪ (Co-I) HKRGC General Research Fund #14307622 (HK\$783,000) ▪ (PI) US National Science Foundation MSPRF DMS-2002103 (US\$150,000) 	2024/01–2024/12 2024/01–2025/12 2023/08–2028/07 2023/08–2026/07 2024/01–2026/12 2023/01–2025/12 2020/07–2023/06
AWARDS AND HONORS	<ul style="list-style-type: none"> ▪ SIAM Early Career Travel Award ▪ NSF Mathematical Sciences Postdoctoral Research Fellowship ▪ SIAM Student Travel Award ▪ NSF-Simons QuantBio Student Fellowship, Harvard University ▪ Silver Medal for Master Thesis, New World Mathematics Award ▪ Best Poster Award, Workshop on Applications-Driven Geometric Functional Data Analysis ▪ Certificate of Distinction in Teaching, Harvard University ▪ Croucher Foundation Scholarship, Croucher Foundation ▪ Hong Kong Scholarship for Excellence, HKSAR Government ▪ Mr. Ch'ien Mu Postgraduate Scholarship, New Asia College, CUHK ▪ Best Teaching Assistant Award, Department of Mathematics, CUHK 	2022 2020–2023 2020 2019–2020 2017 2017 2017 2016–2019 2016 2016 2014–2015
PRESENTATIONS	<ul style="list-style-type: none"> ▪ SIAM Conference on Imaging Science (SIAM-IS24), Atlanta, GA, USA <i>Geometric design of kirigami metamaterials</i> ▪ SIAM Conference on Applied Linear Algebra (SIAM-LA24), Paris, France <i>Kirigami metamaterial design using linear algebra</i> ▪ CUHK SIAM Student Annual Workshop, Hong Kong <i>Density-equalizing map with applications</i> ▪ 2024 Joint Mathematics Meetings (JMM 2024), San Francisco, CA, USA <i>Quantifying shape variation using quasi-conformal geometry</i> ▪ BIRS Workshop on Mathematical Methods for Exploring and Analyzing Morphological Shapes across Biological Scales, Banff, Canada (Virtual) <i>Quantifying shape variation using quasi-conformal geometry</i> ▪ The 10th International Congress on Industrial and Applied Mathematics (ICIAM 2023), Tokyo, Japan <i>Density-equalizing map with applications</i> ▪ Geometry and Packing in Materials Science and Biology (GeomPack) (Virtual) <i>Geometric design of kirigami metamaterials</i> ▪ New England Workshop on the Mechanics of Materials and Structures (NEW.Mech 2022), Cambridge, MA, USA <i>Additive kirigami</i> ▪ SIAM Conference on Imaging Science (SIAM-IS22) (Virtual) <i>Geometric design of kirigami metamaterials</i> ▪ APS March Meeting 2022, Chicago, IL, USA <i>Additive design of origami and kirigami</i> ▪ APS March Meeting 2021 (Virtual) <i>Reconfigurable kirigami</i> ▪ SIAM Conference on Imaging Science (SIAM-IS20) (Virtual) <i>Quantifying shape variation using quasi-conformal geometry</i> 	May 2024 May 2024 Mar 2024 Jan 2024 Sep 2023 Aug 2023 Dec 2022 May 2022 Mar 2022 Mar 2022 Mar 2021 Jul 2020

- The 8th Annual Winter Q-Bio Conference (2020 Winter Q-Bio),
Waikoloa Village, HI, USA
Planar morphometrics via Teichmüller mappings Feb 2020
- MIT Physical Mathematics Seminar, Cambridge, MA, USA
Geometric and topological control of kirigami Dec 2019
- New England Workshop on the Mechanics of Materials and Structures (NEW.Mech 2019), Amherst, MA, USA
Geometric and topological control of kirigami Oct 2019
- APS March Meeting 2019, Boston, MA, USA
Inverse kirigami design Mar 2019
- SIAM Conference on Computational Science and Engineering (SIAM-CSE19), Spokane, WA, USA
Density-equalizing reference map with applications Feb 2019
- International Conference on Applied Mathematics (ICAM) 2018, Hong Kong
Density-equalizing maps for simply-connected open surfaces Jun 2018
- New England Workshop on the Mechanics of Materials and Structures (NEW.Mech 2017), Cambridge, MA, USA
Programming shape using kirigami tessellations Oct 2017
- Workshop on Applications-Driven Geometric Functional Data Analysis, Tallahassee, FL, USA
Planar morphometrics via Teichmüller mappings (with the Best Poster Paper Award) Oct 2017
- The Third International Conference on Engineering and Computational Mathematics (ECM2017), Hong Kong
Planar morphometrics via Teichmüller mappings Jun 2017
- Croucher Symposium 2016, Hong Kong
Geometric problems in biology Dec 2016
- International Conference on Applied Mathematics (ICAM) 2016, Hong Kong
Spherical conformal parameterization of genus-0 point clouds for meshing Jun 2016
- The Hong Kong Mathematical Society Annual General Meeting 2016, Hong Kong
Spherical conformal parameterization of genus-0 point clouds for meshing May 2016
- The Hong Kong Mathematical Society Annual General Meeting 2015, Hong Kong
Fast Disk conformal parameterization of simply-connected open surfaces May 2015
- International Conference on Applied Mathematics (ICAM) 2014, Hong Kong
FLASH: Fast landmark aligned spherical harmonic parameterization for genus-0 closed brain surfaces Dec 2014
- 2014 Imaging Science Camp, Guangzhou, China
FLASH: Fast landmark aligned spherical harmonic parameterization for genus-0 closed brain surfaces Nov 2014
- SIAM Conference on Imaging Science (SIAM-IS14), Hong Kong
Fast optimized harmonic registration of genus-0 closed surfaces with landmark constraints May 2014

TEACHING

The Chinese University of Hong Kong

- **Lecturer**, Department of Mathematics 2023–Present
 - MATH1010 University Mathematics, Fall 2023.

Massachusetts Institute of Technology

- **Instructor in Applied Mathematics**, Department of Mathematics 2021–2023
 - (Course Administrator) 18.03 Differential Equations, Spring 2023.
 - (Lecturer) 18.085/18.0851 Computational Science and Engineering, Fall 2022. (Student evaluation = 6.2/7.0)
 - (Guest Lecturer) 18.04 Complex Variables with Applications, Spring 2022.
 - (Recitation Instructor) 18.06 Linear Algebra, Spring 2022. (Student evaluation = 6.6/7.0)
 - (Recitation Instructor) 18.03 Differential Equations, Fall 2021. (Student evaluation = 6.2/7.0)

Harvard University

- **Teaching Fellow**, John A. Paulson School of Engineering and Applied Sciences (SEAS) 2017
 - AM205 Advanced Scientific Computing: Numerical Methods, Fall 2017.
(with *Certificate of Distinction in Teaching*; Student evaluation = 4.71/5.00, SEAS average = 4.29/5.00)

The Chinese University of Hong Kong

- **Teaching Assistant**, Department of Mathematics 2014–2016
 - MATH3220 Operations Research and Logistics, Spring 2016.
 - MATH3080 Number Theory, Fall 2015.
 - MATH3220 Operations Research and Logistics, Spring 2015. (with *2014–15 Best Teaching Assistant Award*)
 - MATH3080 Number Theory, Fall 2014. (with *2014–15 Best Teaching Assistant Award*)

	■ Teaching Assistant Leader, EPYMT The Enrichment Programme for Young Mathematics Talents (EPYMT) is an enrichment programme offered by the Department of Mathematics for mathematically gifted secondary school students.	2012–2015
	<ul style="list-style-type: none"> • SAYT1134 Towards Differential Geometry, Summer 2015. • SAYT1134 Towards Differential Geometry, Summer 2014. • SAYT1114 Number Theory and Cryptography, Summer 2012. 	
	■ Assistant Mentor, EPYMT	2011–2013
	<ul style="list-style-type: none"> • CUSA0114 Enrichment Mentoring Mathematics II, November 2012 – July 2013. • CUSA0104 Enrichment Mentoring Mathematics I, October 2012 – July 2013. • CUSA0114 Enrichment Mentoring Mathematics II, October 2011 – June 2012. 	
	■ Teaching Assistant, EPYMT	2011–2012
	<ul style="list-style-type: none"> • SAYT1134 Towards Differential Geometry, Summer 2012. • SAYT1154 Mathematical Analysis: An Overture I, Spring 2012. • SAYT1114 Number Theory and Cryptography, Summer 2011. • CUSA1014 Geometric Perspectives of Complex Numbers, Summer 2011. 	
MENTORING	UNDERGRADUATE STUDENTS	
	■ Jerry Jijun Cui (CUHK) <ul style="list-style-type: none"> • Topic: Functional and shape data analysis 	2023–Present
	■ Yanwen Huang (CUHK) <ul style="list-style-type: none"> • Topic: Density-equalizing maps 	2023–Present
	■ Lucy Liu (Harvard University) <ul style="list-style-type: none"> • Senior thesis: “Beyond Grid Kirigami” • Publications: Proc. R. Soc. A (2020); Phys. Rev. Research (2022) • Next position: Ph.D. Student in Applied Mathematics, Harvard University 	2019–2022
	HIGH SCHOOL STUDENTS	
	■ Hiu-Long Chan (Baptist Lui Ming Choi Secondary School, Hong Kong) <ul style="list-style-type: none"> • Research project: “On the Coprime Product Series and Its Divergence and Bounds” (with Bock-Man Cheung) • Award: Gold Award in Mathematics, 2022 S.T. Yau High School Science Award (Asia) • Next position: Undergraduate Student in Mathematics, University of Southampton 	2022
	■ Bock-Man Cheung (Baptist Lui Ming Choi Secondary School, Hong Kong) <ul style="list-style-type: none"> • Research project: “On the Coprime Product Series and Its Divergence and Bounds” (with Hiu-Long Chan) • Award: Gold Award in Mathematics, 2022 S.T. Yau High School Science Award (Asia) • Next position: Undergraduate Student in Mathematics, UCLA 	2022
PROFESSIONAL ACTIVITIES		
	■ Internal Service, MIT Mathematics <ul style="list-style-type: none"> • Undergraduate Academic Advisor • Graduate Student Teaching Mentor 	2022–2023
	■ Conference Organization <ul style="list-style-type: none"> • Co-organizer, Minisymposium on “Geometry, Computing and Learning for Science and Engineering”, SIAM Conference on Imaging Science (SIAM-IS) 2022 	
	■ Editorial Boards <ul style="list-style-type: none"> • Frontiers in Materials, 2023–Present 	
	■ Referee Service <ul style="list-style-type: none"> • Journal reviewer Nature Materials; Nature Communications; Advanced Materials; Communications Physics; Communications Materials; Physical Review Applied; Extreme Mechanics Letters; Meccanica; PLOS Computational Biology; IEEE Transactions on Medical Imaging; IEEE Transactions on Visualization and Computer Graphics; SIAM Journal on Imaging Sciences; Journal of Scientific Computing; Computer Aided Geometric Design; Journal of Mathematical Imaging and Vision; Computational Geometry: Theory and Applications; Geometry, Imaging and Computing; Mathematics, Computation and Geometry of Data; Current Medical Imaging Reviews; Mathematical Reviews • Proposal reviewer Dutch Research Council 	2015–Present
OUTREACH ACTIVITIES		
	■ Invited Speaker, Baptist Lui Ming Choi Secondary School, Hong Kong (Virtual) <ul style="list-style-type: none"> • Topic: Origami and kirigami: art, mathematics, science and technology 	2021
	■ Invited Speaker, Baptist Lui Ming Choi Secondary School, Hong Kong (Virtual) <ul style="list-style-type: none"> • Topic: On mathematics study and research 	2020
	■ ICED Epic Innovation Session Presenter, Innovative Conceptual Engineering Design Program, Nipmuc Regional High School, USA	2019

- Gave a talk about designing shape-shifting structures using kirigami to high school students, teachers, and community members in Massachusetts for promoting science, technology and innovation.
- **Hang Lung Fun Math Tutorial Class Volunteer**, Hang Lung As One Volunteer Team and Department of Mathematics, CUHK, Hong Kong 2016
- Provided free mathematics tutoring service to underprivileged primary school students and organized mathematics-related games to arouse their interest in mathematics.
- **Mathematics Teacher Volunteer**, Hang Lung As One Volunteer Team and Department of Mathematics, CUHK, Hong Kong 2015
- Provided free mathematics tutoring service to underprivileged primary school students.

SOFTWARE

SURFACE PARAMETERIZATION AND HARMONICS

- Spherical Density-Equalizing Map 2024
<https://github.com/garyptchoi/spherical-density-equalizing-map>
- Ellipsoidal Conformal and Quasi-Conformal Map 2023
<https://github.com/garyptchoi/ellipsoidal-map>
- Multiply-Connected Quasiconformal Map 2023
<https://github.com/garyptchoi/multiply-connected-quasiconformal-map>
- Spherical Cap Harmonics 2021
<https://github.com/easd-epfl/spherical-cap-harmonics>
- Poly-Annulus Conformal Map 2021
<https://github.com/garyptchoi/poly-annulus-conformal-map>
- Rectangular Conformal Map 2016
<https://www.mathworks.com/matlabcentral/fileexchange/67117-rectangular-conformal-map>
- Disk Conformal Map 2015
<https://www.mathworks.com/matlabcentral/fileexchange/65571-disk-conformal-map>
- Spherical Conformal Map 2015
<https://www.mathworks.com/matlabcentral/fileexchange/65551-spherical-conformal-map>

IMAGE PROCESSING

- TRIM: Triangulating Image 2018
<https://www.mathworks.com/matlabcentral/fileexchange/68629-trim-triangulating-image>

METAMATERIALS

- Additive Kirigami 2022
<https://github.com/garyptchoi/additive-kirigami>
- 2D Kirigami Deployment Simulator 2021
https://github.com/lliu12/kirigami_sim
- Inverse Kirigami Design 2019
<https://github.com/garyptchoi/inverse-kirigami-design>

Last updated on 2024-04-07