

# Gary Pui-Tung CHOI

John A. Paulson School of Engineering and Applied Sciences, Harvard University

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## Education

### Harvard University

*Ph.D. in Applied Mathematics*

- Advisors: Prof. L. Mahadevan, Prof. Chris Rycroft

**USA**  
2016–Present

### The Chinese University of Hong Kong

*M.Phil. in Mathematics*

- Advisor: Prof. Ronald Lok Ming Lui
- Thesis: Surface Conformal/Quasi-conformal Parameterization with Applications

**Hong Kong**  
2014–2016

### The Chinese University of Hong Kong

*B.Sc. in Mathematics, First Class Honors*

- Streams: Enrichment Stream in Mathematics, Computational and Applied Mathematics Stream
- Minors: Computer Science, Earth System Science

**Hong Kong**  
2010–2014

## Research Interest

Computational Differential Geometry, Geometric Morphometrics, Medical Imaging, Scientific Computing, Geometry Processing, with applications to Biology, Medicine, Physics and Engineering

## Publications and Preprints

### Submitted.....

- [2] GPT Choi, CH Rycroft, *Density-equalizing maps for simply-connected open surfaces*. Submitted. Preprint, arXiv:1704.02525.
- [1] CP Yung, GPT Choi, K Chen, LM Lui, *TRIM: Triangulating images for efficient registration*. Submitted. Preprint, arXiv:1605.06215.

### Published/Accepted.....

- [7] GPT Choi, Y Chen, LM Lui, B Chiu, *Conformal mapping of carotid vessel wall and plaque thickness measured from three-dimensional ultrasound images*. **Medical & Biological Engineering & Computing**, 2017. (Online First: doi:10.1007/s11517-017-1656-4)
- [6] GPT Choi, MHY Man, LM Lui, *Fast spherical quasiconformal parameterization of genus-0 closed surfaces with application to adaptive remeshing*. Accepted for publication in **Geometry, Imaging and Computing**.
- [5] GPT Choi, LM Lui, *A linear formulation for disk conformal parameterization of simply-connected open surfaces*. **Advances in Computational Mathematics**, 2017. (Online First: doi:10.1007/s10444-017-9536-x)
- [4] TW Meng, GPT Choi, LM Lui, *TEMPO: Feature-endowed Teichmüller extremal mappings of point clouds*. **SIAM Journal on Imaging Sciences**, vol. 9, no. 4, pp. 1922–1962, 2016.
- [3] GPT Choi, KT Ho, LM Lui, *Spherical conformal parameterization of genus-0 point clouds for meshing*. **SIAM Journal on Imaging Sciences**, vol. 9, no. 4, pp. 1582–1618, 2016.
- [2] PT Choi, LM Lui, *Fast disk conformal parameterization of simply-connected open surfaces*. **Journal of Scientific Computing**, vol. 65, no. 3, pp. 1065–1090, 2015.
- [1] PT Choi, KC Lam, LM Lui, *FLASH: Fast landmark aligned spherical harmonic parameterization for genus-0 closed brain surfaces*. **SIAM Journal on Imaging Sciences**, vol. 8, no. 1, pp. 67–94, 2015.

## Selected Awards

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### Croucher Foundation.....

- Croucher Foundation Scholarship 2016–2019  
Awarded to the best Hong Kong students for doctoral study in science, medicine or technology, with full tuition, stipend and travel support.

### Hong Kong Special Administrative Region Government.....

- Hong Kong Scholarship for Excellence 2016  
Awarded to the best Hong Kong students for overseas study, with the prestigious title of Hong Kong Scholar.
- Talent Development Scholarship 2013  
Awarded to outstanding students in Hong Kong who have demonstrated talent or potential in innovation, science and technology.

### The Chinese University of Hong Kong.....

- Mr. Ch'ien Mu Postgraduate Scholarship 2016
- Best Teaching Assistant Award 2014–2015
- Undergraduate Mathematics Scholarship 2014
- Student Development Scholarship for Mathematics Undergraduates 2014
- Undergraduate Research Award 2014
- Undergraduate Research Award 2013
- Dr. Chao Yong Chi-hsing Mathematics Scholarship 2012
- Dr. Daisy Li Mathematics Award 2011

## Talks

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11. The Third International Conference on Engineering and Computational Mathematics (ECM2017), May 31 – June 2, 2017, Hong Kong.  
Title: *Planar morphometrics via Teichmüller mappings.*
10. Numerics Journal Club, April 27, 2017, Harvard University, USA.  
Title: *Surface parameterization and density-equalizing maps.*
9. Numerics Journal Club, February 16, 2017, Harvard University, USA.  
Title: *Geometric problems in physics and biology.*
8. The Applied Math Lab Seminar, February 15, 2017, Harvard University, USA.  
Title: *Planar morphometrics via Teichmüller mappings.*
7. (Invited talk) Croucher Symposium 2016, December 8, 2016, Hong Kong.  
Title: *Geometric problems in biology.*
6. International Conference on Applied Mathematics (ICAM) 2016, May 30 – June 2, 2016, Hong Kong.  
Title: *Spherical conformal parameterization of genus-0 point clouds for meshing.*
5. (Invited talk) The Hong Kong Mathematical Society Annual General Meeting 2016, May 21, 2016, Hong Kong.  
Title: *Spherical conformal parameterization of genus-0 point clouds for meshing.*
4. (Invited talk) The Hong Kong Mathematical Society Annual General Meeting 2015, May 23, 2015, Hong Kong.  
Title: *Fast Disk conformal parameterization of simply-connected open surfaces.*
3. International Conference on Applied Mathematics (ICAM) 2014, December 1–5, 2014, Hong Kong.  
Title: *FLASH: Fast landmark aligned spherical harmonic parameterization for genus-0 closed brain surfaces.*
2. 2014 Imaging Science Camp, October 31 – November 2, 2014, Guangzhou, China.  
Title: *FLASH: Fast landmark aligned spherical harmonic parameterization for genus-0 closed brain surfaces.*
1. SIAM Conference on Imaging Science (SIAM-IS14), May 12–14, 2014, Hong Kong.  
Title: *Fast optimized harmonic registration of genus-0 closed surfaces with landmark constraints.*

## Professional Service

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*Journal Reviewer*

2015–Present

- Mathematical Reviews
- Geometry, Imaging and Computing
- Current Medical Imaging Reviews

## Teaching Experience

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John A. Paulson School of Engineering and Applied Sciences, Harvard University.....

*Teaching Fellow*

2017–Present

- AM205 Advanced Scientific Computing: Numerical Methods. Fall 2017.

Department of Mathematics, The Chinese University of Hong Kong.....

*Teaching Assistant*

2014–2016

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

*EPYMT\* Teaching Assistant Leader*

2012–2015

\*The EPYMT is an enrichment programme for high school mathematics talents.

- SAYT1134 Towards Differential Geometry (Tutorial). Summer 2015.
- SAYT1134 Towards Differential Geometry (Tutorial). Summer 2014.
- SAYT1114 Number Theory and Cryptography (Tutorial). Summer 2012.

*EPYMT Assistant Mentor*

2011–2013

- CUSA0114 Enrichment Mentoring Mathematics II (Discussion Group). Nov 2012 – Jul 2013.
- CUSA0104 Enrichment Mentoring Mathematics I (Discussion Group). Oct 2012 – Jul 2013.
- CUSA0114 Enrichment Mentoring Mathematics II (Discussion Group). Oct 2011 – Jun 2012.

*EPYMT Teaching Assistant*

2011–2012

- SAYT1134 Towards Differential Geometry (Tutorial). Summer 2012.
- SAYT1154 Mathematical Analysis: An Overture I (Tutorial). Spring 2012.
- SAYT1114 Number Theory and Cryptography (Tutorial). Summer 2011.
- CUSA1014 Geometric Perspectives of Complex Numbers (Tutorial). Summer 2011.

## Community Outreach

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Hang Lung As One.....

- Hang Lung Fun Math Tutorial Class Volunteer 2016  
Offered one-to-one free mathematics tutorial services to underprivileged primary students and organized mathematics-related games to arouse students' interest in mathematics.

- Mathematics Teacher Volunteer 2015  
Provided weekly mathematics tutoring service to primary students from low-income families.

## Computer Skills

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MATLAB, C/C++, Mathematica, Python, Java, L<sup>A</sup>T<sub>E</sub>X, Linux, MS Office

## Personal Information

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- Address: 29 Oxford Street, Pierce Hall 405, Cambridge, MA 02138, USA
- Languages: English (Fluent), Cantonese Chinese (Native), Mandarin Chinese (Fluent), Japanese (Basic)

Last updated: July 17, 2017