Man-Kwun Chiu

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Employment History

2022–Present **Assistant Professor**, *Department of Computer Science*, Wenzhou-Kean University, China.

2018–2022 **Researcher**, *Institut für Informatik*, Freie Universität Berlin, Germany.
- Researching for the complexity class problems inside Total Function Nondeterministic Polynomial (TFNP) such as Polynomial Parity Argument (PPA) and Continuous Local Search (CLS).

2015–2018 **Project Researcher**, *JST ERATO Kawarabayashi Large Graph Project*, National Institute of Informatics, Japan.
- Researched for the problems about consistent digital segments, geodesic paths in polygonal domain and memory constrained algorithms.

2014–2015 **Post-doctoral Fellow**, *Hong Kong University of Science and Technology*, Hong Kong.
- Researched for the problem of finding the shortest path in weighted regions.

2006–2014 **Teaching/Research Assistant**, *Hong Kong University of Science and Technology*, Hong Kong.
- Prepared tutorial materials and gave tutorials to students;
- Prepared and graded written and programming assignments,
- for the following courses:
  - Discrete Math. for Computer Science
  - Object-Oriented Programming
  - Data Structures and Algorithms
  - Design and Analysis of Algorithms
  - Theory of Computation
- Researched for the problem of reconstructing manifold.

2004–2005 **Undergraduate Internship**, *Hong Kong and Shanghai Banking Corporation Limited (HSBC)*, IT department, Hong Kong.
- Implemented an activity log query system.

Teaching Experience

2024 Spring **CPS 1032**, *Microcomputer applications*, Instructor.

2024 Spring **CPS 4980**, *Special Topics in CS: Computational Geometry*, Instructor.

2023 Fall **CPS 3440**, *Analysis of algorithms*, Instructor.
Student evaluation: 4.09/5

2023 Spring **CPS 1032**, *Microcomputer applications*, Instructor.
Student evaluation: 4.23/5

2023 Spring **CPS 4980**, *Special Topics in CS: Computational Geometry*, Instructor.
Student evaluation: 4.6/5

2022 Fall **CPS 1032**, *Microcomputer applications*, Instructor.
Student evaluation: 4.06/5

2022 Fall **CPS 3440**, *Analysis of algorithms*, Instructor.
Student evaluation: 3.33/5

Service

2023–present **Curriculum Committee**, *Wenzhou-Kean University*.

2023–present **Hiring Committee**, *Wenzhou-Kean University*.

Education

2008–2014 **Doctor of Philosophy in Computer Science and Engineering**, *Hong Kong University of Science and Technology*, Hong Kong.
Thesis title: Manifold Reconstruction from Discrete Point Sets
Advisor : Prof. Siu-Wing Cheng

2006–2008 **Master of Philosophy in Computer Science and Engineering**, *Hong Kong University of Science and Technology*, Hong Kong.
Thesis title : Dimension Detection via Slivers
Advisor : Prof. Siu-Wing Cheng

2002–2006 **Bachelor of Engineering in Computer Science with minor in Mathematics**, *Hong Kong University of Science and Technology*, Hong Kong.
First Class Honors (Grade : 11.39 out of 12)

Scholarships and Awards

2006 HKUST Academic Achievement Medal
Awarded annually to the top 1% HKUST graduates

2002–2006 Dean's List: six semesters
Obtained a term grade average of at least 10pt(A-) (12 pt scale)

2006 Hong Kong Telecom Institute of Information Technology Scholarship (≈ US$4000)

2006 Wu Ti Hsien Science & Education Foundation Fund Scholarship (≈ US$1200)

2005 The Hong Kong Jockey Club Mini Game Design Award

2004 Wu Ti Hsien Science & Education Foundation Fund Scholarship (≈ US$1200)

2004 The Chinese General Chamber of Commerce Scholarship (≈ US$4000)

Publications

Publications in international journals

[1] Man-Kwun Chiu, Stefan Felsner, Manfred Scheucher, Felix Schröder, Raphael Steiner, and Birgit Vogtenhuber. "Coloring circle arrangements: New 4-chromatic planar graphs". In: *European Journal of Combinatorics* (2023), p. 103839.

[2] Man-Kwun Chiu, Matias Korman, Martin Suderland, and Takeshi Tokuyama. "Distance bounds for high dimensional consistent digital rays and 2-D partially-consistent digital rays". In: *Discrete & Computational Geometry* (2022).

[3] Kai Jin, Siu-Wing Cheng, Man-Kwun Chiu, and Man Ting Wong. "A Generalization of Self-Improving Algorithms". In: *ACM Trans. Algorithms* 18.3 (Oct. 2022).

[4] Zachary Abel, Hugo A. Akitaya, Man-Kwun Chiu, Erik D. Demaine, Martin L. Demaine, Adam Hesterberg, Matias Korman, Jayson Lynch, André van Renssen, and Marcel Roeloffzen. "Snipperclips: Cutting tools into desired polygons using themselves". In: *Computational Geometry* 98 (2021), p. 101784.

[5] Elena Arseneva, Man-Kwun Chiu, Matias Korman, Aleksandar Markovic, Yoshio Okamoto, Aurélien Ooms, André van Renssen, and Marcel Roeloffzen. "Rectilinear link diameter and radius in a rectilinear polygonal domain". In: *Computational Geometry* 92 (2021), p. 101685.

[6] Bahareh Banyassady, Man-Kwun Chiu, Matias Korman, Wolfgang Mulzer, André van Renssen, Marcel Roeloffzen, Paul Seiferth, Yannik Stein, Birgit Vogtenhuber, and Max Willert. "Routing in polygonal domains". In: *Computational Geometry* 87 (2020), p. 101593.

[7] Paz Carmi, Man-Kwun Chiu, Matthew J. Katz, Matias Korman, Yoshio Okamoto, André van Renssen, Marcel Roeloffzen, Taichi Shiitada, and Shakhar Smorodinsky. "Balanced line separators of unit disk graphs". In: *Computational Geometry* 86 (2020).

[8] Man-Kwun Chiu, Stefan Felsner, Manfred Scheucher, Patrick Schnider, Raphael Steiner, and Pavel Valtr. "On the Average Complexity of the k-Level". In: *Journal of Computational Geometry* 11.1 (2020), pp. 493–506.

[9] Siu-Wing Cheng and Man-Kwun Chiu. "Implicit Manifold Reconstruction". In: *Discrete & Computational Geometry* 62.3 (Oct. 2019), pp. 700–742.

[10] Man-Kwun Chiu and Matias Korman. "High Dimensional Consistent Digital Segments". In: *SIAM Journal on Discrete Mathematics* 32.4 (2018), pp. 2566–2590.

[11] Jean-François Baffier, Man-Kwun Chiu, Yago Diez, Matias Korman, Valia Mitsou, André van Renssen, Marcel Roeloffzen, and Yushi Uno. "Hanabi is NP-hard, Even for Cheaters who Look at Their Cards". In: *Theoretical Computer Science* 675 (2017), pp. 43–55.

[12] Siu-Wing Cheng, Man-Kwun Chiu, Jiongxin Jin, and Antoine Vigneron. "Navigating Weighted Regions with Scattered Skinny Tetrahedra". In: *International Journal of Computational Geometry & Applications* 27.01n02 (2017), pp. 13–32.

[13] Siu-Wing Cheng and Man-Kwun Chiu. "Tangent Estimation from Point Samples". In: *Discrete & Computational Geometry* 56.3 (2016), pp. 505–557.

Publications in peer reviewed conferences

[14] Oswin Aichholzer, Man-Kwun Chiu, Hung P. Hoang, Michael Hoffmann, Jan Kyncl, Yannic Maus, Birgit Vogtenhuber, and Alexandra Weinberger. "Drawings of Complete Multipartite Graphs Up to Triangle Flips". In: *39th International Symposium on Computational Geometry, SoCG 2023,* 2023.

[15] Man-Kwun Chiu, Stefan Felsner, Manfred Scheucher, Felix Schröder, Raphael Steiner, and Birgit Vogtenhuber. "Coloring Circle Arrangements: New 4-Chromatic Planar Graphs". In: *Extended Abstracts EuroComb 2021*. Springer, 2021, pp. 84–91.

[16] Siu-Wing Cheng, Man-Kwun Chiu, Kai Jin, and Man Ting Wong. "A Generalization of Self-Improving Algorithms". In: *36th International Symposium on Computational Geometry, SoCG 2020, June 23-26, 2020, Zürich, Switzerland*. Ed. by Sergio Cabello and Danny Z. Chen. Vol. 164. LIPIcs. Schloss Dagstuhl - Leibniz-Zentrum für Informatik, 2020, 29:1–29:13.

[17] Man-Kwun Chiu, Aruni Choudhary, and Wolfgang Mulzer. "Computational Complexity of the α-Ham-Sandwich Problem". In: *47th International Colloquium on Automata, Languages, and Programming (ICALP 2020)*. Ed. by Artur Czumaj, Anuj Dawar, and Emanuela Merelli. Vol. 168. Leibniz International Proceedings in Informatics (LIPIcs). Dagstuhl, Germany: Schloss Dagstuhl–Leibniz-Zentrum für Informatik, 2020, 31:1–31:18.

[18] Man-Kwun Chiu, Jonas Cleve, Katharina Klost, Matias Korman, Wolfgang Mulzer, André van Renssen, Marcel Roeloffzen, and Max Willert. "Routing in Histograms". In: *Algorithms and Computation - 14th International Conference, WALCOM 2020, Singapore, March 31 - April 2, 2020, Proceedings*. Ed. by M. Sohel Rahman, Kunihiko Sadakane, and Wing-Kin Sung. Vol. 12049. Lecture Notes in Computer Science. Springer, 2020, pp. 43–54.

[19] Man-Kwun Chiu, Erik D. Demaine, Yevhenii Diomidov, David Eppstein, Robert A. Hearn, Adam Hesterberg, Matias Korman, Irene Parada, and Mikhail Rudoy. "New Results in Sona Drawing: Hardness and TSP Separation". In: *Proceedings of the 32nd Canadian Conference on Computational Geometry, (CCCG 2020)*. 2020, pp. 63–72.

[20] Man-Kwun Chiu, Matias Korman, Martin Suderland, and Takeshi Tokuyama. "Distance bounds for high dimensional consistent digital rays and 2-D partially-consistent digital rays". In: *28th Annual European Symposium on Algorithms (ESA 2020)*. Vol. 173. 2020, 34:1–34:22.

[21] Elena Arseneva, Man-Kwun Chiu, Matias Korman, Aleksandar Markovic, Yoshio Okamoto, Aurélien Ooms, André van Renssen, and Marcel Roeloffzen. "Rectilinear Link Diameter and Radius in a Rectilinear Polygonal Domain". In: *29th International Symposium on Algorithms and Computation, ISAAC 2018, December 16-19, 2018, Jiaoxi, Yilan, Taiwan*. 2018, 58:1–58:13.

[22] Bahareh Banyassady, Man-Kwun Chiu, Matias Korman, Wolfgang Mulzer, André van Renssen, Marcel Roeloffzen, Paul Seiferth, Yannik Stein, Birgit Vogtenhuber, and Max Willert. "Routing in Polygonal Domains". In: *Proceedings of the 28th International Symposium on Algorithms and Computation (ISAAC 2017)*. 2017, 10:1–10:13.

[23] Paz Carmi, Man-Kwun Chiu, Matthew J. Katz, Matias Korman, Yoshio Okamoto, André van Renssen, Marcel Roeloffzen, Taichi Shiitada, and Shakhar Smorodinsky. "Balanced Line Separators of Unit Disk Graphs". In: *Proceedings of the 15th Algorithms and Data Structures Symposium (WADS 2017)*. Vol. 10389. Lecture Notes in Computer Science. 2017, pp. 241–252.

[24] Man-Kwun Chiu and Matias Korman. "High Dimensional Consistent Digital Segments". In: *33rd International Symposium on Computational Geometry (SoCG 2017)*. 2017, 31:1–31:15.

[25] Jean-François Baffier, Man-Kwun Chiu, Yago Diez, Matias Korman, Valia Mitsou, André van Renssen, Marcel Roeloffzen, and Yushi Uno. "Hanabi is NP-complete, Even for Cheaters who Look at Their Cards". In: *Proceedings of the 8th International Conference on Fun with Algorithms (FUN 2016)*. 2016, 4:1–4:17.

[26] Siu-Wing Cheng, Man-Kwun Chiu, Jiongxin Jin, and Antoine Vigneron. "Navigating Weighted Regions with Scattered Skinny Tetrahedra". In: *Proceedings of the 26th International Symposium on Algorithms and Computation (ISAAC 2015)*. 2015, pp. 35–45.

[27] Siu-Wing Cheng and Man-Kwun Chiu. "Implicit Manifold Reconstruction". In: *Proceedings of the 25th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA 2014)*. 2014, pp. 161–173.

[28] Siu-Wing Cheng and Man-Kwun Chiu. "Dimension detection via slivers". In: *Proceedings of the 20th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA 2009)*. 2009, pp. 1001–1010.

Conference Presentations

Mar. 2018 **Rectilinear Link Diameter and Radius in a Rectilinear Polygonal Domain**, *the 34th European Workshop on Computational Geometry (EuroCG 2018)*, Berlin, Germany.

July 2017 **High Dimensional Consistent Digital Segments**, *the 33rd International Symposium on Computational Geometry (SoCG 2017)*, Brisbane, Australia.

May 2017 **High Dimensional Consistent Digital Segments**, *the 10th Annual Meeting of the Asian Association for Algorithms and Computation (AAAC 2017)*, HKUST, Hong Kong.

Dec. 2015 **Navigating Weighted Regions with Scattered Skinny Tetrahedra**, *the 26th International Symposium on Algorithms and Computation (ISAAC 2015)*, Nagoya, Japan.

May 2014 **Implicit Manifold Reconstruction**, *the 7th Annual Meeting of the Asian Association for Algorithms and Computation (AAAC 2014)*, Hangzhou, China.

Jan. 2014 **Implicit Manifold Reconstruction**, *the 25th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA 2014)*, Portland, USA.

Nov. 2013 **Tangent Estimation from Point Samples**, *the ACM-HK Student Research and Career Day 2013*, HKUST, Hong Kong.

Apr. 2012 **Tangent Estimation from Point Samples**, *the 5th Annual Meeting of the Asian Association for Algorithms and Computation (AAAC 2012)*, Shanghai, China.

Apr. 2009 **Dimension detection via slivers**, *the 2nd Annual Meeting of the Asian Association for Algorithms and Computation (AAAC 2009)*, Hangzhou, China.

Mar. 2009 **Dimension detection via slivers**, *the ACM-HK Student Research and Career Day 2009*, Hong Kong Baptist University, Hong Kong.

Jan. 2009 **Dimension detection via slivers**, *the 20th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA 2009)*, New York, USA.

Other Presentations

Apr. 2019 **The Number of Convex Polyominoes with Given Height and Width**, *Discrete Geometry Seminar*, Discrete Geometry Group, Mathematical Institute, Freie Universität Berlin, Germany.

Organizing Committees

I have been part of organizing the following conferences.

Jun. 2022 **Computational Geometry Week 2022**, Berlin.
`https://www.inf.fu-berlin.de/inst/ag-ti/socg22/index.html`

Reviews

I have reviewed papers for the following journals and conferences.

Journals

Algorithmica, CGTA, Graphs and Combinatorics, DCG, IJCGA, JoCG, JIP, JISE, TCS, Transactions on Algorithms

Conferences

WADS, CCCG, EuroCG, ESA, FOCS, ICALP, COCOON, WALCOM, COCOA, ISAAC, SoCG, JCDCG^2, LATIN, SWAT, SODA

Programming Languages

LaTeX, MATLAB, C++, Java, COBOL, ASP.NET

Languages

Mothertongue	**Chinese (Cantonese)**
Fluent	**English, Chinese (Putonghua)**
Basic	**Japanese**