

Sing Chun LEE

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Research Interests

Computer Science Education I am interested in developing web-based engaging computer science education tools using augmented reality and quest-based learning methodology.

Augmented Reality I am interested in developing perceptually intuitive visualization algorithms for immersive entertainment and medical data using non-photorealistic renderings.

Geometry Processing I am interested in developing new computational techniques and algorithms using the finite element framework and geometric calculus.

Education

Johns Hopkins University – Computer Science Department Baltimore, MD, US
Ph.D. in Computer Science Jul 2023
M.Sci.Eng. in Computer Science May 2017

- ▶ Advisor (2019-2023): Prof. Michael (Misha) Kazhdan
- ▶ Co-Advisor (2016-2019): Prof. Dr. Nassir Navab
- ▶ Dissertation: [Hierarchical Gradient Domain Vector Field Processing](#)

TUM Technische Universität München – Informatik Munich, BY, DE
M.Sci. in Biomedical Computing Dec 2015

- ▶ Thesis Advisor: Prof. Dr. Nassir Navab
- ▶ Thesis: Integration of RGBD Camera and mobile C-arms-Calibration, Accuracy and Application

The Chinese University of Hong Kong – Department of Mathematics and Department of Information Engineering Sha Tin, NT, HK
B.Eng. in Information Engineering May 2010
M.Sci. in Mathematics May 2009

- ▶ Final Year Project (FYP) Advisor: Prof. Hon Fu (Raymond) Chan
- ▶ FYP: Image Upsampling via Tight Frame Transform

Academic Appointments

Bucknell University – Computer Science Department Lewisburg, PA, US
Assistant Professor Aug 2023 – Present

Johns Hopkins University – Computer Science Department Baltimore, MD, US
Research Intern Apr 2015 – Dec 2015
Graduate Research Assistant (Part-time) Jan 2016 – Dec 2016
Graduate Teaching Assistant (Part-time) Jan 2017 – May 2017
Graduate Teaching Assistant (Part-time) Jan 2018 – Dec 2020
(Co-)Instructor (Part-time) Sep 2019 – Dec 2021
Graduate Teaching Assistant (Part-time) Sep 2021 – May 2023

Universitätsklinik Balgrist – Orthopädie Zurich, ZH, CH
Visiting Scholar Jun 2019 – Aug 2019

TUM Technische Universität München – Informatik Munich, BY, DE
Course Assistant (Part-time) Nov 2013 – Feb 2014
Student Helper – HiWi (Part-time) May 2014 – Mar 2015

Helmholtz Zentrum München – Computational Health Center

Student Helper – HiWi (Part-time)

Neuherberg, BY, DE

Aug 2014 – Mar 2015

The Hong Kong University of Science and Technology – Department of Electronic & Computer Engineering

Research Assistant

Clear Water Bay, NT, HK

Jul 2013 – Aug 2013

Industrial Experiences

Intuitive Surgical Inc. – Research & Development Department

Computer Graphics and Visualization Software Engineering (Intern)

Sunnyvale, CA, US

Jun 2017 – Jan 2018

Medability GmbH – Research & Development Department

Software Engineer (Part-time)

Munich, BY, DE

Feb 2015 – Apr 2015

Azeus Systems Ltd. – Application Team

Junior Associate

Quarry Bay, HK, HK

Feb 2011 – Feb 2013

Associate

Feb 2013 – Jul 2013

Mobigator Technology Group Ltd. – Software Team

Software Engineer

Kwun Tong, KLN, HK

Dec 2010 – Jan 2011

ASM Pacific Technology Ltd. – Application Team

Computer Vision Engineer

Tsing Yi, NT, HK

May 2010 – Dec 2010

Selected Publications

Journal Articles

- [J1] Maximilian Kohlbrenner, **Sing Chun Lee**, Marc Alexa, and Misha Kazhdan. “Poisson Manifold Reconstruction - Beyond Co-dimension One”. In: *Comput. Graph. Forum* 42.5 (2023), pp. i–viii. DOI: [10.1111/CGF.14907](https://doi.org/10.1111/CGF.14907).
- [J2] **Sing Chun Lee** and Misha Kazhdan. “Dense Point-to-Point Correspondences Between Genus-Zero Shapes”. In: *Comput. Graph. Forum* 38.5 (2019), pp. 27–37. DOI: [10.1111/CGF.13787](https://doi.org/10.1111/CGF.13787).
- [J3] **Sing Chun Lee**, Bernhard Fuerst, Javad Fotouhi, Marius Fischer, Greg Osgood, and Nassir Navab. “Calibration of RGBD camera and cone-beam CT for 3D intra-operative mixed reality visualization”. In: *Int. J. Comput. Assist. Radiol. Surg.* 11.6 (2016), pp. 967–975. DOI: [10.1007/S11548-016-1396-1](https://doi.org/10.1007/S11548-016-1396-1).

Peer-Reviewed Conference and Workshop Papers

- [C1] **Sing Chun Lee**, Matthias Seibold, Philipp Fünstahl, Mazda Farshad, and Nassir Navab. “Pivot calibration concept for sensor attached mobile c-arms”. In: *Medical Imaging 2020: Image-Guided Procedures, Robotic Interventions, and Modeling, Houston, TX, USA, February 15-20, 2020*. Ed. by Baowei Fei and Cristian A. Linte. Vol. 11315. SPIE Proceedings. SPIE, 2020, p. 1131503. DOI: [10.1117/12.2547581](https://doi.org/10.1117/12.2547581).
- [C2] Laura Fink, **Sing Chun Lee**, Jie Ying Wu, Xingtong Liu, Tianyu Song, Yordanka Velikova, Marc Stamminger, Nassir Navab, and Mathias Unberath. “LumiPath - Towards Real-Time Physically-Based Rendering on Embedded Devices”. In: *Medical Image Computing and Computer Assisted Intervention - MICCAI 2019 - 22nd International Conference, Shenzhen, China, October 13-17, 2019, Proceedings, Part V*. Ed. by Dinggang Shen, Tianming Liu, Terry M. Peters, Lawrence H. Staib, Caroline Essert, Sean Zhou, Pew-Thian Yap, and Ali R. Khan. Vol. 11768. Lecture Notes in Computer Science. Springer, 2019, pp. 673–681. DOI: [10.1007/978-3-030-32254-0_75](https://doi.org/10.1007/978-3-030-32254-0_75).

- [C3] **Sing Chun Lee**, Keisuke Tateno, Bernhard Fuerst, Federico Tombari, Javad Fotouhi, Greg Osgood, Alex Johnson, and Nassir Navab. “Mixed Reality Support for Orthopaedic Surgery”. In: *IEEE International Symposium on Mixed and Augmented Reality, ISMAR 2017 Adjunct, Nantes, France, October 9-13, 2017*. IEEE Computer Society, 2017, pp. 204–205. DOI: [10.1109/ISMAR-ADJUNCT.2017.67](https://doi.org/10.1109/ISMAR-ADJUNCT.2017.67).

Informal and Other Publications

- [I1] **Sing Chun Lee**. “Hierarchical Gradient Domain Vector Field Processing”. In: *Johns Hopkins University handle/10.2312/3543933* (2023). Graphics Dissertation Online: [10.2312/3543933](https://www.jhu.edu/handle/10.2312/3543933).

Software and Education Tools

Interactive Parse/Generic Tree (2024)

Link: <https://eg.bucknell.edu/~sc1019/tool/index.html>

Exterior Poisson Reconstruction (2023)

Link: <https://cs.jhu.edu/~misha/Code/ExteriorPoissonRecon>

Dense Point-to-Point Correspondences (2019)

Link: <https://cs.jhu.edu/~misha/Code/DenseP2PCorrespondences>

LumiPath (2019)

Link: <https://github.com/lorafib/LumiPath>

Mixed Reality Support for Orthopaedic Surgery (2017)

Link: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5683202/>

C-arm-RGBD-Camera Calibration (2016)

Link: <https://pure.johnshopkins.edu/en/publications/calibration-of-rgb-d-camera-and-cone-beam-ct-for-3d-intra-operativ>

Needle Tracking (2016)

Link: <https://pure.johnshopkins.edu/en/publications/dual-robot-ultrasound-guided-needle-placement-closing-the-plannin>

Image-Based Tool Tracking (2016)

Link: <https://pure.johnshopkins.edu/en/publications/image-based-trajectory-tracking-control-of-4-dof-laparoscopic-ins-2>

Awards and Prices

Academic Career

MIT Reality Hack 2024 RECOVER — 1st Vitality Unleashed, 1st Startup Hack, 3rd Overall

Link: <https://devpost.com/software/recovr-5ubk10>

Graduate

SGP 2023 Poisson Manifold Reconstruction - Beyond Co-dimension One — *Best Paper Award*

Link: <https://sgp2023.github.io/awards/>

Hopkins 2022 Convocation and Department Awards Professor Joel Dean Excellence in Teaching Award

Link: <https://www.cs.jhu.edu/news/2022-convocation-and-department-awardees/>

MICCAI-AE-CAI Workshop 2017 Multi-modal Imaging, Model-based Tracking and Mixed Reality Visualisation for Orthopaedic Surgery — *Outstanding Paper Award*

Link: <https://camp.lcsr.jhu.edu/outstanding-paper-award-at-miccai-workshop-ae-cai/>

NASA Space App 2016 Interact with Aurora — *Global Nominee*

Link: <https://2016.spaceappschallenge.org/challenges/space-station/virtual-auroras/projects/novel-augmented-superficial-aurora-nasa>