

Research Interests

My Ph.D. research bridged the gap between rough freehand line drawings and precise digital representations, as well as generating line drawings from 3D models. I am now expanding into generative image models and attribution, focusing on creative technologies that assist artists. My work spans 2D/3D geometry, vector graphics, non-photorealistic rendering, and analyzing LoRA models fine-tuned to mimic artistic styles. This aligns with my goal of integrating technical advances into artistic processes to foster a collaborative relationship between technology and creativity.

Education

Sep 2016 – Jun 2023	University of British Columbia Ph.D. in Computer Graphics. Advised by Prof. Alla Sheffer.
Aug 2013 – Dec 2014	Carnegie Mellon University M.S. in Computer Science.
Sep 2009 – Jun 2013	Beihang University B.Eng. in Computer Science and Technology. Ranking: 2/188.

Publications

Chenxi Liu, Towaki Takikawa, and Alec Jacobson (2024). *A LoRA is Worth a Thousand Pictures*. Under review. arXiv: 2412.12048 [cs.CV]

Chenxi Liu* and Mikhail Bessmeltsev* (2024). *State-of-the-art Report in Sketch Processing*. Eurographics'25 STAR (Conditional Acceptance)

Chenxi Liu, Siqi Wang, Matthew Fisher, Deepali Aneja, and Alec Jacobson (2024). *2D Neural Fields with Learned Discontinuities*. Eurographics'25 (Conditional Acceptance). arXiv: 2408.00771 [cs.CV]

Siqi Wang, **Chenxi Liu**, Daniele Panozzo, Denis Zorin, and Alec Jacobson (2023). “Bézier Spline Simplification Using Locally Integrated Error Metrics”. In: *SIGGRAPH Asia 2023 Conference Papers*. ACM

Chenxi Liu (2023). “Processing Freehand Vector Sketches”. PhD thesis. University of British Columbia

Chenxi Liu, Toshiki Aoki, Mikhail Bessmeltsev, and Alla Sheffer (July 2023). “StripMaker: Perception-Driven Learned Vector Sketch Consolidation”. In: *ACM Trans. Graph.* 42.4. SIGGRAPH'23

Chenxi Liu, Pierre Bénard, Aaron Hertzmann, and Shayan Hoshyari (Feb. 2023). “ConTesse: Accurate Occluding Contours for Subdivision Surfaces”. In: *ACM Trans. Graph.* 42.1. SIGGRAPH'23

Jerry Yin*, **Chenxi Liu***, Rebecca Lin, Nicholas Vining, Helge Rhodin, and Alla Sheffer (2022). “Detecting Viewer-Perceived Intended Vector Sketch Connectivity”. In: *ACM Trans. Graph.* 41.4. SIGGRAPH'22

Dave Pagurek van Mossel, **Chenxi Liu**, Nicholas Vining, Mikhail Bessmeltsev, and Alla Sheffer (2021). “StrokeStrip: Joint Parameterization and Fitting of Stroke Clusters”. In: *ACM Trans. Graph.* 40.4. SIGGRAPH’21

Yulia Gryaditskaya, Felix Hähnlein, **Chenxi Liu**, Alla Sheffer, and Adrien Bousseau (2020). “Lifting Freehand Concept Sketches into 3D”. in: *ACM Trans. Graph.* 39.6. SIGGRAPH Asia’20, pp. 1–16

Chenxi Liu, Enrique Rosales, and Alla Sheffer (2018). “StrokeAggregator: Consolidating Raw Sketches into Artist-Intended Curve Drawings”. In: *ACM Trans. Graph.* 37.4. SIGGRAPH’18

Chenxi Liu, Jessica Hodgins, and James McCann (July 2017). “Whole-cloth Quilting Patterns from Photographs”. In: *Proceedings of the Symposium on Non-Photorealistic Animation and Rendering.* NPAR’17

Lea Albaugh, April Grow, **Chenxi Liu**, James McCann, Gillian Smith, and Jennifer Mankoff (2016). “Threadsteading: Playful Interaction for Textile Fabrication Devices”. In: *Proceedings of the 2016 CHI Conference Extended Abstracts.* CHI’16. ACM

Research & Professional Experience

Jul 2023 – Present	DGP Lab, University of Toronto Postdoctoral Fellow. Supervised by Prof. Alec Jacobson.
Mar 2023 – Jun 2023	Adobe Research Research Intern. Supervised by Deepali Aneja and Prof. Alec Jacobson.
Sep 2016 – Feb 2023	Digital Geometry Processing Group, Imager Lab, UBC Research Assistant. Advised by Prof. Alla Sheffer. Conducting research on the artistic creation tools.
May 2020 – Nov 2020	Adobe Research Research Intern. Supervised by Aaron Hertzmann. Conducted research on non-photorealistic line drawing generation.
Mar 2015 – Jul 2016	Textile Lab, Disney Research Pittsburgh Research Associate. Supervised by Prof. James McCann & Prof. Jessica Hodgins. Conducted research on automatic quilting pattern generation using CNC quilting machine and graph theory.
Jul 2014 – Aug 2014	CMU Graphics Lab Research Assistant. Advised by Prof. Kayvon Fatahalian. Built a visualization module for a lighting control framework using Arnold.
Jul 2012 – Sep 2012	Microsoft Search Technology Center Asia Intern, Software Development Engineer in Test. Wrote scripts to gather statistical data and create analyses from search engine logs.
Aug 2011 – Dec 2011	Laboratory for Information Security and Intelligent Information Processing, Beihang University Research Assistant. Advised by Prof. Zhoujun Li. Built a tool to capture software exception messages.

Honors

Apr 2024	Eurographics 2024 PhD Thesis Award, Honorable Mention Eurographics and the Computer Graphics Forum Journal.
Feb 2024	Faculty of Arts & Science Postdoctoral Fellowship Faculty of Arts & Science, University of Toronto.
May 2022	WiGRAPH Rising Stars The ACM Community Group for Women in Computer Graphics Research.
Oct 2016	Technology Award Winner: Threadsteading IndieCade'16.
Nov 2011	National Scholarship (Top 1% in Academic Performance) Ministry of Education of the People's Republic of China.
Dec 2012, 2011, 2010	The First Prize Scholarship of Academic Performance Beihang University.

Talks & Exhibition

Jun 2024	SGP'24 Graduate School Course: Fundamentals and Applications of Sketch Processing.
Aug 2023	SIGGRAPH'23 Conference Presenter: ConTesse: Accurate Occluding Contours for Subdivision Surfaces. StripMaker: Perception-driven Learned Vector Sketch Consolidation.
Fall 2022	University of Toronto, Université de Montréal, University of Surrey Invited Talk: Cleaning Up Vector Sketches Made by Humans and Computers.
Aug 2022	SIGGRAPH'22 Conference Presenter: Detecting Viewer-Perceived Intended Vector Sketch Connectivity.
Aug 2018	SIGGRAPH'18 Conference Presenter: Strokeaggregator: Consolidating raw sketches into artist-intended curve drawings.
Jul 2017	NPAR'17 Conference Presenter: Whole-cloth quilting patterns from photographs.
Mar 2016	Alt.Ctrl.GDC, Game Developers Conference Exhibitor: Threadsteading. (Game also attended CHI Interactivity, 2016. IndieCade, 2016)

Teaching Experience

Fall, 2023	CSC317@UofT: Computer Graphics Guest Lecturer and Co-Developer of LEAF+ Project (Understanding the Limits of AI-Based Image Generators with DALL·E 2 and Midjourney). Project Lead: Prof. Alec Jacobson.
Winter 1, 2022	CPSC424@UBC: Geometric Modeling Graduate Teaching Assistant, Instructor: Prof. Alla Sheffer.
Winter, 2019	Instructional Skills Workshops for Grad Students@UBC
Winter 2, 2018	CPSC436D@UBC: Video Game Programming Graduate Teaching Assistant, Instructor: Prof. Alla Sheffer.
Winter 2, 2016	CPSC418@UBC: Parallel Computation Graduate Teaching Assistant, Instructor: Prof. Mark Greenstreet.

Undergraduate Advising

2023 – 2024	Sepehr Ghasemipour University of Toronto.
2023 – 2024	Silvia Lopez University of Toronto.
2022 – 2023	Toshiki Aoki University of Tokyo.

Services

2024	DGP Academy Project Lead: Low-Poly Fabrication. Media.
2019 – Present	Conference and Journal Paper Review SIGGRAPH'22,23,24. SIGGRAPH Asia'22,24. Eurographics'20,22,23,24. Pacific Graphics'20,24. TVCG'23. CGF'22,24. IEEE CG&A'20. TPAMI'19. SCF'19. UIST'24.
2018	Graduate Student Recruiting Committee Student Representative of Computer Graphics.
2016 – 2017	AMORE Seminar Imager Lab seminar organizer.

Skills

Programming: C/C++, Python, MATLAB, Java, SQL.

Libraries and Tools: libigl, CGAL, scikit-learn, CUDA, OpenCL, OpenGL, CMake, Git.

Visual Editing: Illustrator, Photoshop, Premiere.

References

Alec Jacobson (Postdoc supervisor, jacobson@cs.toronto.edu), University of Toronto.
Alla Sheffer (Ph.D. supervisor, sheffa@cs.ubc.ca), University of British Columbia.
Aaron Hertzmann (internship mentor, hertzman@dgp.toronto.edu), Adobe Research.