Chenxi Liu

Updated: September, 2024
Email: liuchenxi0921@gmail.com
Web: https://chenxil21.github.io/

Research Interests

My Ph.D. research focused on bridging the gap between rough freehand line drawings and precise digital representations, as well as generating robust line drawings from 3D models. I am now expanding into generative image models and attribution, focusing on creative technologies that assist artists. My interests span 2D/3D geometry, vector graphics, non-photorealistic rendering, and generative image attribution.

Currently, I am working on analyzing LoRA models that are fine-tuned to mimic distinct artistic styles, focusing on the attribution of LoRAs. This project fits into a larger theme of integrating technical advances into artistic processes, fostering a more 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, Siqi Wang, Matthew Fisher, Deepali Aneja, and Alec Jacobson. 2d neural fields with learned discontinuities. *arXiv preprint arXiv:2408.00771*, 2024

Siqi Wang, **Chenxi Liu**, Daniele Panozzo, Denis Zorin, and Alec Jacobson. Bézier spline simplification using locally integrated error metrics. In *SIGGRAPH Asia 2023 Conference Papers*, SA '23. ACM, 2023

Chenxi Liu. *Processing freehand vector sketches*. PhD thesis, University of British Columbia, 2023

Chenxi Liu, Toshiki Aoki, Mikhail Bessmeltsev, and Alla Sheffer. Stripmaker: Perception-driven learned vector sketch consolidation. *ACM Trans. Graph.*, 42(4), Jul 2023

Chenxi Liu, Pierre Bénard, Aaron Hertzmann, and Shayan Hoshyari. Contesse: Accurate occluding contours for subdivision surfaces. *ACM Trans. Graph.*, 42(1), February 2023

Jerry Yin*, **Chenxi Liu***, Rebecca Lin, Nicholas Vining, Helge Rhodin, and Alla Sheffer. Detecting viewer-perceived intended vector sketch connectivity. *ACM Trans. Graph.*, 41, 2022. *Joint first authors

Dave Pagurek van Mossel, **Chenxi Liu**, Nicholas Vining, Mikhail Bessmeltsev, and Alla Sheffer. Strokestrip: Joint parameterization and fitting of stroke clusters. *ACM Trans. Graph.*, 40(4), 2021

Yulia Gryaditskaya, Felix Hähnlein, **Chenxi Liu**, Alla Sheffer, and Adrien Bousseau. Lifting freehand

concept sketches into 3d. *ACM Trans. Graph.*, 39(6):1–16, 2020

Chenxi Liu, Enrique Rosales, and Alla Sheffer. Strokeaggregator: Consolidating raw sketches into artist-intended curve drawings. *ACM Trans. Graph.*, 37(4), 2018

Chenxi Liu, Jessica Hodgins, and James McCann. Whole-cloth quilting patterns from photographs. In *Proceedings of the Symposium on Non-Photorealistic Animation and Rendering*, NPAR'17, July 2017

Lea Albaugh, April Grow, **Chenxi Liu**, James McCann, Gillian Smith, and Jennifer Mankoff. Threadsteading: Playful interaction for textile fabrication devices. In *Proceedings of the 2016 CHI Conference Extended Abstracts*. ACM, 2016

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.