Alexander Lex

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BIOGRAPHY

Dr. Alexander Lex is a **Professor of Human-Computer Interaction** at the Institute of Human-Centred Computing in the Faculty of Computer Science and Biomedical Engineering at **Graz University of Technology**. He leads the **Visualization Design Lab**, where his research focuses on data visualization and human-computer interaction. He also holds adjunct appointments at the Scientific Computing and Imaging Institute and the Kahlert School of Computing at the University of Utah. Alex is a **co-founder of datavisyn**, a company specializing in visual analytics solutions for the pharmaceutical industry.

His work has been recognized with an NSF CAREER award, a test of time award, and multiple best paper awards and honorable mentions at premier venues including IEEE VIS, ACM CHI, and EuroVis. He received a best dissertation award from his alma mater.

Alex currently serves as an Associate Editor for IEEE Transactions on Visualization and Computer Graphics (TVCG) and IEEE Computer Graphics and Applications (CG&A). He was an Area Papers Chair for IEEE VIS in 2021 and 2023.

Prior to joining Graz University of Technology, Alex was a Professor of Computer Science at the University of Utah, and earlier a Lecturer and Postdoctoral Fellow at Harvard University. He received his PhD, Master's, and undergraduate degrees from Graz University of Technology.

He and his lab have published many open source software packages, including UpSet (a set visualization technique), reVISit (a platform for running online user studies), LineUp (a ranking visualization technique), MultiNet Multinet (a multivariate network visualization platform) , Loon (a life-cell microscopy analysis platform), and trrack (a provenance tracking library).

Research Interest

Interactive data visualization, human computer interaction, accessibility, user study methodology, bioinformatics, visualization for biomedicine, visual analytics, data science.

Professional Appointments

Graz University of Technology
Professor at the Institute for Human-Centred Computing — *Since 08/2025*

University of Utah
Adjunct Professor at the Kahlert School of Computing	*Since 08/2025*
Professor at the Kahlert School of Computing	*07/2025-08/2025*
Director of Graduate Studies at the Kahlert School of Computing	*07/2022–06/2025*
Associate Professor at the Kahlert School of Computing	*07/2020–06/2025*
Assistant Professor at the Kahlert School of Computing	*07/2015–06/2020*
Faculty Member at the Scientific Computing and Imaging Institute	*Since 07/2015*
Member of the Huntsman Cancer Institute	*Since 07/2015*

datavisyn — *Since 12/2017*
Co-Founder and *Advisor*

On sabbatical at datavisyn for the academic year 21/22
`http://datavisyn.io`

Harvard University   *10/2012–05/2015*
Post-Doctoral Fellow at the Visual Computing Group at SEAS
Lecturer, teaching CS 171, Visualization, *01/2015–05/2015*

Graz University of Technology   *03/2012–09/2012*
Post-Doctoral Researcher

Department for Biomedical Informatics at **Harvard Medical School**   *08/2011–09/2011*
Visiting Researcher

Graz University of Technology   *08/2010–09/2012*
Lecturer ("Universitätsassistent")

Graz University of Technology   *08/2008–07/2012*
Research Assistant

Education

Post-Doctoral Training   *10/2012–05/2015*
Harvard University
Mentor: Prof. Hanspeter Pfister

Doctoral Program in Computer Science   *09/2008–03/2012*
Graz University of Technology
Thesis: Visualization of Multidimensional Data with Applications in Molecular Biology
Advisor: Prof. Dieter Schmalstieg
graduated with highest distinction

Visiting PhD Student   *08/2011–09/2011*
Harvard Medical School
Advisors: Prof. Peter Park, Dr. Nils Gehlenborg

Master's Program ("Dipl.-Ing.")   *09/2006–07/2008*
Software Development and Business Management
Graz University of Technology
graduated with highest distinction

Bachelor's Program ("Bakk.rer.soc.oec")   *09/2002–09/2006*
Software Engineering and Knowledge Management
Graz University of Technology

HONORS AND AWARDS

Best Paper Award, IEEE VIS, for the *reVISit 2* paper (top 5 paper out of 537 submissions), 2025.

Best Paper Honorable Mention Award, IEEE VIS, for the *Here's what you need to know about my data* paper (top 17 paper out of 537 submissions), 2025.

Best Paper Award, IEEE VIS, for the *Aardvark* paper (top 5 paper out of 557 submissions), 2024.

10-Year Test of Time Award, IEEE InfoVis, for the *UpSet* paper published in 2014, 2024.

Outstanding Associate Editor Award, IEEE Computer Graphics & Applications, 2023.

Best Paper Honorable Mention Award, IEEE VIS, for the *Loon* paper, 2021.

Best Abstract Honorable Mention Award, BioVis at ISMB/ECCV, for the *Loon* abstract, 2021.

Honorable Mention Award (Poster), IEEE VIS, for the *Arctic Explorer Poster*, 2019.

NSF CAREER Award, 2018.

Honorable Mention Award (top 3 paper out of 183 submissions), EuroGraphics/IEEE EuroVis, for the *Pathfinder* paper, 2016.

Human Technology Interface Award, awarded by the State of Styria, for the work on *cancer subtype visualization (StratomeX)*, 2015.

Honorable Mention Award (top 3 paper out of 196 submissions), IEEE InfoVis, for the *Domino* paper, 2014.

Honorable Mention Award (top 5% paper, 3200 submissions), ACM CHI, for the *Show me the Invisible* paper, 2014.

Best Paper Award (of 152 submissions), IEEE InfoVis, for the *LineUp* paper, 2013.

Honorable Mention Award, IEEE BioVis Contest, 2013.

Excellence in Teaching Scholarship, funding a guest lecture at JKU Linz, awarded by the state of Upper Austria, 2013.

Best Dissertation Award by the "Forum Technology and Society", Graz University of Technology, 2012.

Best Paper Award (of 32 submissions), IEEE BioVis, for the *enRoute* paper, 2012.

3rd Best Paper Award (of 202 submissions), EuroGraphics/IEEE EuroVis, 2012, for the *StratomeX* paper.

Best Paper Award (of 172 submissions), IEEE InfoVis, 2011, for the *Context-Preserving Visual Links* paper.

Best Student Paper Award (of 88 submissions), ACM Graphics Interface, 2010, for the *Visual Links across Applications* paper.

RESEARCH GRANTS AND CONTRACTS

In total, I have acquired more than $ 6.5m for my lab since joining the University of Utah in 2015 and have participated in project proposals that resulted in about $ 31.3m of funding.

Merit-Review Based Grants at the University of Utah
For multi-PI grants, my share and the share going to the University of Utah (if different) are given.

ForeSITE: Forecasting and Surveillance of Infectious Threats and Epidemics
PI: Matthew Samore, Co-I, CDC, 2024–2029. $ 17,500,000 (Lex: $ 1,200,000).

Development and pre-clinical validation of Quantitative Imaging of Cell state Kinetics (QuICK) to inform selection of melanoma therapy
PI: Thomas Zangle, Co-I, NIH R01, 1R01CA276653-01A1, 2023–2028. $ 2,296,007 (Lex: $ 574,839).

Enhancing Loon: Increasing Robustness and Generalizing Input Formats for a Visualization Tool for Large-Scale Microscopy Data
Project PI: Alexander Lex[1], NIH P30 Supplement, NIH NCI 3P30CA042014-34S6, 2023–2024. $ 231,000 (Lex: $ 212,298).

Collaborative Research: CCRI: New: reVISit: Scalable Empirical Evaluation of Interactive Visualizations
PI: Alexander Lex, NSF CNS 2213756, 2022–2026. $ 1,999,461 ($ 1,252,178).

Achieving Accessibility for UpSet Plots
PI: Alexander Lex, Chan Zuckerberg Initiative, EOSS5, 2022–2024. $ 350.000.

Visualization and Analysis of Melanoma Cell Quantitative Phase Imaging Data,
PI: Alexander Lex, Computational Oncology Research Initiative (CORI), Huntsman Cancer Foundation, 2020–2021. $ 45.000 (Lex: $ 36,000).

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[1]This is a supplemental grant to the Huntsman Cancer Institute's P30 cancer center grant. The PI of the parent grant and the PI of record for all supplements is Cornelia Ulrich.

Visualizing Genealogies and Geography in the Utah Population Database (UPDB),
PI: Alexander Lex, Computational Oncology Research Initiative (CORI), Huntsman Cancer Foundation, 2020–2021. $ 45.000 (Lex: $ 36,000).

EAGER: Understanding and Mitigating Misinformation in Visualizations On Social Media,
PI: Alexander Lex, NSF IIS 2041136, 2021–2022. $ 200,000 ($ 100,000).

Visualization and Integration of Cancer Cell Response Data by QPI,
PI: Thomas Zangle, Co-PI, 1U4U Seed Grants, University of Utah, 2019–2020. $ 30.000 (Lex: $ 15,000).

Collaborative Research: Framework: Software: HDR: Reproducible Visual Analysis of Multivariate Networks with MultiNet, PI: Miriah Meyer, Co-PI, NSF OAC 18350904, 01/2019–12/2022. $ 2,022,200 (Utah: $ 1,115,768, Lex: $ 529,929).

CAREER: Enabling Reproducibility of Interactive Visual Data Analysis, PI: Alexander Lex, NSF IIS 1751238, 2018–2023. $ 512,245.
Research Experiences for Undergraduates (REU) Supplement 2020. $ 16,000.

Lineage: Integrating Clinical and Genetic Data with Genealogical Records, PI: Alexander Lex, Utah Genome Project Seed Grant, 2018–2019. $ 46,454.

Increasing the State's Resiliency to Fluctuations in Defense Spending by Strengthening the Carbon Composite Sector Knowledge Base, PI: Greg Jones, Co-PI, Department of Defense, 2016–2018. $ 3,792,367 ($ 172,961).

Visual Analysis of Genomic and Clinical Data from Large Patient Cohorts, PI: Peter Park, NIH U01 CA198935, Co-Investigator, Subcontract, 2015–2018. $ 1,524,006, ($ 243,966).

Sponsored Research Agreements at the University of Utah

Sanguine: Visualizing Blood Transfusion Data. Funded by ARUP Laboratories, 2022–2024. $ 60,000.

Visualizing Genealogies and Geography in the Utah Population Database. Funded by the Utah Population Database, 2020–21. $ 40,000.

Visualizing Blood Transfusion Data Continued. Funded by ARUP Laboratories, 2021–2022. $ 112,257.

Visualizing Blood Transfusion Data. Funded by ARUP Laboratories, 2019–2020. $ 153,133.

Visualization and Interaction with a Workforce Needs Prediction Model. Funded by the State of Utah, 2019–2020. $ 156,133.

cTracks: Visualizing Copy Number Data. Funded by ARUP Laboratories, 2018–2019. $ 126,420.

Visualizing Copy Number Data. Funded by ARUP Laboratories, 2017. $ 47,218.

Visualizing Outcome Scores Associated with Orthopaedic Surgery. Funded by the Department of Orthopaedics, University of Utah, 2017. $ 24,800.

Visualizing Survey Data. Funded by the College of Nursing, University of Utah, 2016. $ 12,400.

Visualizing Patient Referral Flow. Funded by the University Hospital, University of Utah, 2016. $ 12,400.

Prior Funding
I contributed significantly to the writing and execution of these grants.

Integrative Pathway-Based Visualization of Heterogeneous Data, PI: Hanspeter Pfister, sponsored research agreement with Novartis Institutes for Biomedical Research, 2014–2016.

Diagnostics of Tumor Heterogeneity — a new Steering Factor for Colorectal Cancer? PI: Gerald Höfler, funded by the state of Styria, Austria, 2012–2014.

Caleydoplex — Information Exploration in Teams., PI: Dieter Schmalstieg, funded by the Austrian Science Fund (FWF), Grant no. P22902, 2011–2014.

InGeneious — Visualization of Biomolecular and Clinical Data. PI: Dieter Schmalstieg, funded by the Austrian Research Promotion Agency (FFG), BRIDGE program, Grant no. 385567, 2009–2011.

Scholarships and other Personal Grants

Erwin Schrödinger Scholarship awarded by the Austrian Science Fund: **Visual Analysis of Heterogeneous Data using Semantic Subsets.** Funding two years of post-doctoral research at Harvard University and a one-year return phase at Graz University of Technology. 2013–2016.

Scholarship for short time academic research and expert courses abroad (KUWI). Granted by the Graz University of Technology. 2011.

Research grant for students ("Förderstipendium") awarded by the Faculty of Computer Science, Graz University of Technology. 2007.

PUBLICATIONS

Students primarily supervised by me are underlined.

Papers

1. Zach Cutler, Jack Wilburn, Hilson Shrestha, Yiren Ding, Brian Bollen, Khandaker Abrar Nadib, Tingying He, Andrew McNutt, Lane Harrison, **Alexander Lex**. *ReVISit 2: A Full Experiment Life Cycle User Study Framework*. IEEE Transactions on Visualization and Computer Graphics (VIS), vol. 32, 2026. **IEEE VIS 2025 Best Paper Award**

2. Haihan Lin, Maxim Lisnic, Derya Akbaba, Miriah Meyer, **Alexander Lex**. *Here's what you need to know about my data: Exploring Expert Knowledge's Role in Data Analysis*. IEEE Transactions on Visualization and Computer Graphics (VIS), vol. 32, no. 1, doi:10.1109/TVCG.2025.3634821, 2026. **IEEE VIS 2025 Honorable Mention Award**

3. Tingying He, Maggie McCracken, Daniel Hajas, Sarah Creem-Regehr, **Alexander Lex**. *Using Tactile Charts to Support Comprehension and Learning of Complex Visualizations for Blind and Low-Vision Individuals*. IEEE Transactions on Visualization and Computer Graphics (VIS), vol. 32, 2026.

4. Sehi L'Yi, Harrison G. Zhang, Andrew P. Mar, Thomas C. Smits, Lawrence Weru, Sofía Rojas, **Alexander Lex**, Nils Gehlenborg. *A Comprehensive Evaluation of Life Sciences Data Resources Reveals Significant Accessibility Barriers*. Scientific Reports, vol. 15, no. 1, pp. 23676, doi:10.1038/s41598-025-08731-7, 2025.

5. Andrew McNutt, Maggie K McCracken, Ishrat Jahan Eliza, Daniel Hajas, Jake Wagoner, Nate Lanza, Jack Wilburn, Sarah Creem-Regehr, **Alexander Lex**. *Accessible Text Descriptions for UpSet Plots*. Computer Graphics Forum (EuroVis), vol. 44, no. 3, doi:10.1111/cgf.70102, 2025.

6. Maxim Lisnic, Zach Cutler, Marina Kogan, **Alexander Lex**. *Visualization Guardrails: Designing Interventions Against Cherry-Picking in Interactive Data Explorers*. ACM SIGCHI Conference on Human Factors in Computing Systems (CHI), pp. 1-19, doi:10.1145/3706598.3713385, 2025.

7. Zach Cutler, Lane Harrison, Carolina Nobre, **Alexander Lex**. *Crowdsourced Think-Aloud Studies*. ACM SIGCHI Conference on Human Factors in Computing Systems (CHI), pp. 1-23, doi:10.1145/3706598.3714305, 2025.

8. Devin Lange, Robert Judson-Torres, Thomas A. Zangle, **Alexander Lex**. *Aardvark: Composite Visualizations of Trees, Time-Series, and Images*. IEEE Transactions on Visualization and Computer Graphics (VIS), vol. 31, no. 1, pp. 1290–1300, doi:10.1109/TVCG.2024.3456193, 2024. **IEEE VIS 2024 Best Paper Award**

9. Klaus Eckelt, Kiran Gadhave, **Alexander Lex**, Marc Streit. *Loops: Leveraging Provenance and Visualization to Support Exploratory Data Analysis in Notebooks*. IEEE Transactions on Visualization and Computer Graphics (VIS), vol. 31, no. 1, pp. 1213–1223, doi:10.31219/osf.io/79eyn, 2024.

10. Maxim Lisnic, **Alexander Lex**, Marina Kogan. *'Yeah, this graph doesn't show that': Analysis of Online Engagement with Misleading Data Visualizations.* ACM SIGCHI Conference on Human Factors in Computing Systems (CHI), pp. 1-14, doi:10.1145/3613904.3642448, 2024.

11. Kiran Gadhave, Zach Cutler, **Alexander Lex**. *Persist: Persistent and Reusable Interactions in Computational Notebooks.* Computer Graphics Forum (EuroVis), vol. 43, no. 3, doi:10.1111/cgf.15092, 2024.

12. Devin Lange, Shaurya Sahai, Jeff M. Phillips, **Alexander Lex**. *Ferret: Reviewing Tabular Datasets for Manipulation.* Computer Graphics Forum (EuroVis), vol. 42, no. 3, pp. 187-198, doi:10.1111/cgf.14822, 2023.

13. Maxim Lisnic, Cole Polychronis, **Alexander Lex**, Marina Kogan. *Misleading Beyond Visual Tricks: How People Actually Lie with Charts.* ACM SIGCHI Conference on Human Factors in Computing Systems (CHI), pp. 1-21, doi:10.1145/3544548.3580910, 2023.

14. Derya Akbaba, Devin Lange, Michael Correll, **Alexander Lex**, Miriah Meyer. *Troubling Collaboration: Matters of Care for Visualization Design Study.* ACM SIGCHI Conference on Human Factors in Computing Systems (CHI), pp. 1-15, doi:10.1145/3544548.3581168, 2023.

15. Haihan Lin, Derya Akbaba, Miriah Meyer, **Alexander Lex**. *Data Hunches: Incorporating Personal Knowledge into Visualizations.* , vol. 29, no. 1, pp. 504-514, doi:10.1109/TVCG.2022.3209451, 2022.

16. Kiran Gadhave, Zach Cutler, **Alexander Lex**. *Reusing Interactive Analysis Workflows.* Computer Graphics Forum (EuroVis), vol. 41, no. 3, pp. 133–144, doi:10.1111/cgf.14528, 2022.

17. Devin Lange, Eddie Polanco, Robert Judson-Torres, Thomas A. Zangle, **Alexander Lex**. *Loon: Using Exemplars to Visualize Large-Scale Microscopy Data.* IEEE Transactions on Visualization and Computer Graphics (VIS), vol. 28, no. 1, pp. 248-258, doi:10.1109/TVCG.2021.3114766, 2021. **IEEE VIS 2021 Honorable Mention Award**

18. Kiran Gadhave, Jochen Görtler, Zach Cutler, Carolina Nobre, Oliver Deussen, Miriah Meyer, Jeff Phillips, **Alexander Lex**. *Predicting Intent Behind Selections in Scatterplot Visualizations.* Information Visualization, vol. 20, no. 4, pp. 207–228, doi:10.1177/14738716211038604, 2021.

19. Jen Rogers, Austin H Patton, Luke Harmon, **Alexander Lex**, Miriah Meyer. *Insights From Experiments With Rigor in an EvoBio Design Study.* IEEE Transactions on Visualization and Computer Graphics (InfoVis), vol. 27, no. 2, pp. 1106-1116, doi:10.1109/TVCG.2020.3030405, 2021.

20. Haihan Lin, Ryan A. Metcalf, Jack Wilburn, **Alexander Lex**. *Sanguine: Visual Analysis for Patient Blood Management.* Information Visualization, vol. 20, no. 2-3, pp. 123-137, doi:10.1177/14738716211028565, 2021.

21. Carolina Nobre, Dylan Wootton, Zach Cutler, Lane Harrison, Hanspeter Pfister, **Alexander Lex**. *reVISit: Looking Under the Hood of Interactive Visualization Studies.* ACM SIGCHI Conference on Human Factors in Computing Systems (CHI), pp. 1-13, doi:10.1145/3411764.3445382, 2021.

22. Carolina Nobre, Dylan Wootton, Lane Harrison, **Alexander Lex**. *Evaluating Multivariate Network Visualization Techniques Using a Validated Design and Crowdsourcing Approach.* ACM SIGCHI Conference on Human Factors in Computing Systems (CHI), pp. 1-12, doi:10.1145/3313831.3376381, 2020.

23. Katarina Furmanova, Samuel Gratzl, Holger Stitz, Thomas Zichner, Miroslava Jaresova, **Alexander Lex**, Marc Streit. *Taggle: Scalable Visualization of Tabular Data through Aggregation.* Information Visualization, vol. 19, no. 2, pp. 114-136, doi:10.1177/1473871619878085, 2019.

24. Alex Bigelow, Carolina Nobre, Miriah Meyer, **Alexander Lex**. *Origraph: Interactive Network Wrangling.* IEEE Conference on Visual Analytics Science and Technology (VAST), pp. 81-92, doi:10.1109/VAST47406.2019.8986909, 2019.

25. G. Elisabeta Marai, Bruno Pinaud, Katja Bühler, **Alexander Lex**, John H. Morris. *Ten Simple Rules to Create Biological Network Figures for Communication.* PLOS Computational Biology, vol. 15, no. 9, pp. e1007244, doi:10.1371/journal.pcbi.1007244, 2019.

26. Carolina Nobre, Marc Streit, Miriah Meyer, **Alexander Lex**. *The State of the Art in Visualizing Multivariate Networks.* Computer Graphics Forum (EuroVis), vol. 38, pp. 807-832, doi:10.1111/cgf.13728, 2019.

27. Jen Rogers, Nicholas Spina, Ashley Neese, Rachel Hess, Darrel Brodke, **Alexander Lex**. *Composer: Visual Cohort Analysis of Patient Outcomes.* Applied Clinical Informatics, vol. 10, no. 2, pp. 278-285, doi:10.1055/s-0039-1687862, 2019.

28. Carolina Nobre, Marc Streit, **Alexander Lex**. *Juniper: A Tree+Table Approach to Multivariate Graph Visualization.* IEEE Transactions on Visualization and Computer Graphics (InfoVis), vol. 25, no. 1, pp. 544-554, doi:10.1109/TVCG.2018.2865149, 2019.

29. Carolina Nobre, Nils Gehlenborg, Hilary Coon, **Alexander Lex**. *Lineage: Visualizing Multivariate Clinical Data in Genealogy Graphs.* IEEE Transactions on Visualization and Computer Graphics, vol. 25, no. 3, pp. 1543-1558, doi:10.1109/TVCG.2018.2811488, 2019.

30. Yan Zheng, Yi Ou, **Alexander Lex**, Jeff M. Phillips. *Visualization of Big Spatial Data using Coresets for Kernel Density Estimates.* IEEE Transactions on Big Data, vol. 7, no. 3, pp. 524-534, doi:10.1109/TBDATA.2019.2913655, 2019.

31. Yan Zheng, Yi Ou, **Alexander Lex**, Jeff M. Phillips. *Visualization of Big Spatial Data using Coresets for Kernel Density Estimates.* IEEE IEEE Symposium on Visualization in Data Science (VDS), doi:10.1109/VDS.2017.8573446, 2017.

32. Jake R. Conway, **Alexander Lex**, Nils Gehlenborg. *UpSetR: An R Package For The Visualization Of Intersecting Sets And Their Properties.* Bioinformatics, vol. 33, no. 18, pp. 2938-2940, doi:10.1093/bioinformatics/btx364, 2017.

33. Michael Kern, **Alexander Lex**, Nils Gehlenborg, Chris R. Johnson. *Interactive Visual Exploration And Refinement Of Cluster Assignments.* BMC Bioinformatics, vol. 18, no. 1, pp. 406, doi:10.1186/s12859-017-1813-7, 2017.

34. Ethan Kerzner, **Alexander Lex**, Crystal Lynn Sigulinsky, Timothy Urness, Bryan William Jones, Robert E. Marc, Miriah Meyer. *Graffinity: Visualizing Connectivity In Large Graphs.* Computer Graphics Forum (EuroVis), vol. 36, no. 3, pp. 251-260, doi:10.1111/cgf.13184, 2017.

35. Hendrik Strobelt, Bilal Alsallakh, Joseph Botors, Brant Peterson, Mark Borowsky, Hanspeter Pfister, **Alexander Lex**. *Vials: Visualizing Alternative Splicing of Genes.* IEEE Transactions on Visualization and Computer Graphics (InfoVis), vol. 22, no. 1, pp. 399–408, doi:10.1109/TVCG.2015.2467911, 2016.

36. Christian Partl, Samuel Gratzl, Marc Streit, Anne Mai Wassermann, Hanspeter Pfister, Dieter Schmalstieg, **Alexander Lex**. *Pathfinder: Visual Analysis of Paths in Graphs.* Computer Graphics Forum (EuroVis), vol. 35, no. 3, pp. 71–80, doi:10.1111/cgf.12883, 2016. **EuroVis 2016 Honorable Mention Award**

37. Samuel Gratzl, **Alexander Lex**, Nils Gehlenborg, Nicola Cosgrove, Marc Streit. *From Visual Exploration to Storytelling and Back Again.* Computer Graphics Forum (EuroVis), vol. 35, no. 3, pp. 491–500, doi:10.1111/cgf.12925, 2016.

38. Christian Partl, **Alexander Lex**, Hendrik Strobelt, Anne Mai Wassermann, Hanspeter Pfister, Dieter Schmalstieg. *ConTour: Data-Driven Exploration of Multi-Relational Datasets for Drug Discovery.* IEEE Transactions on Visualization and Computer Graphics (VAST), vol. 20, no. 12, pp. 1883–1892, doi:10.1109/TVCG.2014.2346752, 2014.

39. Marc Streit, **Alexander Lex**, Samuel Gratzl, Christian Partl, Dieter Schmalstieg, Hanspeter Pfister, Peter Park, Nils Gehlenborg. *Guided Visual Exploration of Genomic Stratifications in Cancer.* Nature Methods, vol. 11, no. 9, pp. 884–885, doi:10.1038/nmeth.3088, 2014.

40. Thomas Geymayer, Markus Steinberger, **Alexander Lex**, Marc Streit, Dieter Schmalstieg. *Show me the Invisible: Visualizing Hidden Content.* ACM Press Proceedings of the SIGCHI Conference on Human

Factors in Computing Systems (CHI), pp. 3705–3714, doi:10.1145/2556288.2557032, 2014. **ACM CHI 2014 Honorable Mention Award**

41. Samuel Gratzl, Nils Gehlenborg, **Alexander Lex**, Hanspeter Pfister, Marc Streit. *Domino: Extracting, Comparing, and Manipulating Subsets across Multiple Tabular Datasets* . IEEE Transactions on Visualization and Computer Graphics (InfoVis), vol. 20, no. 12, pp. 2023–2032, doi:10.1109/TVCG.2014.2346260, 2014. **IEEE InfoVis 2014 Honorable Mention Award**

42. Johnathan D Mercer, Balaji Pandian, **Alexander Lex**, Nicolas Bonnel, Hanspeter Pfister. *Mu-8: Visualizing Differences between Proteins and their Families.* BMC Proceedings, vol. 8, no. Suppl 2, pp. S5, doi:10.1186/1753-6561-8-S2-S5, 2014.

43. **Alexander Lex**, Nils Gehlenborg, Hendrik Strobelt, Romain Vuillemot, Hanspeter Pfister. *UpSet: Visualization of Intersecting Sets.* IEEE Transactions on Visualization and Computer Graphics (InfoVis), vol. 20, no. 12, pp. 1983–1992, doi:10.1109/TVCG.2014.2346248, 2014. **10 Year InfoVis Test of Time Award, 2024**

44. Cagatay Turkay, **Alexander Lex**, Marc Streit, Hanspeter Pfister, Helwig Hauser. *Characterizing Cancer Subtypes using the Dual Analysis Approach in Caleydo StratomeX.* IEEE Computer Graphics and Applications, vol. 34, no. 2, pp. 38–47, doi:10.1109/MCG.2014.1, 2014.

45. **Alexander Lex**, Christian Partl, Denis Kalkofen, Marc Streit, Anne Mai Wassermann, Samuel Gratzl, Dieter Schmalstieg, Hanspeter Pfister. *Entourage: Visualizing Relationships between Biological Pathways using Contextual Subsets.* IEEE Transactions on Visualization and Computer Graphics (InfoVis), vol. 19, no. 12, pp. 2536–2545, doi:10.1109/TVCG.2013.154, 2013.

46. Samuel Gratzl, **Alexander Lex**, Nils Gehlenborg, Hanspeter Pfister, Marc Streit. *LineUp: Visual Analysis of Multi-Attribute Rankings.* IEEE Transactions on Visualization and Computer Graphics (InfoVis), vol. 19, no. 12, pp. 2277–2286, doi:10.1109/TVCG.2013.173, 2013. **IEEE InfoVis 2013 Best Paper Award**

47. Christian Partl, **Alexander Lex**, Marc Streit, Denis Kalkofen, Karl Kashofer, Dieter Schmalstieg. *enRoute: Dynamic Path Extraction from Biological Pathway Maps for Exploring Heterogeneous Experimental Datasets.* BMC Bioinformatics, vol. 14, no. Suppl 19, pp. S3, doi:10.1186/1471-2105-14-S19-S3, 2013.

48. Christian Partl, **Alexander Lex**, Marc Streit, Denis Kalkofen, Karl Kashofer, Dieter Schmalstieg. *enRoute: Dynamic Path Extraction from Biological Pathway Maps for In-Depth Experimental Data Analysis.* Proceedings of the IEEE Symposium on Biological Data Visualization (BioVis), pp. 107–114, doi:10.1109/BioVis.2012.6378600, 2012. **IEEE BioVis 2012 Best Paper Award**

49. Marc Streit, Hans-Jörg Schulz, **Alexander Lex**, Dieter Schmalstieg, Heidrun Schumann. *Model-Driven Design for the Visual Analysis of Heterogeneous Data* . IEEE Transactions on Visualization and Computer Graphics, vol. 18, no. 6, pp. 998–1010, doi:10.1109/TVCG.2011.108, 2012.

50. **Alexander Lex**, Marc Streit, Hans-Jörg Schulz, Christian Partl, Dieter Schmalstieg, Peter Park, Nils Gehlenborg. *StratomeX: Visual Analysis of Large-Scale Heterogeneous Genomics Data for Cancer Subtype Characterization.* Computer Graphics Forum (EuroVis), vol. 31, no. 3, pp. 1175–1184, doi:10.1111/j.1467-8659.2012.03110.x, 2012. **EuroVis 2012 3rd Best Paper Award**

51. Clemens Holzhüter, **Alexander Lex**, Dieter Schmalstieg, Hans-Jörg Schulz, Heidrun Schumann, Marc Streit. *Visualizing Uncertainty in Biological Expression Data.* Proceedings of the SPIE Conference on Visualization and Data Analysis (VDA), vol. 8294, pp. 82940O-82940O-11, doi:10.1117/12.908516, 2012.

52. **Alexander Lex**, Hans-Jörg Schulz, Marc Streit, Christian Partl, Dieter Schmalstieg. *VisBricks: Multiform Visualization of Large, Inhomogeneous Data* . IEEE Transactions on Visualization and Computer Graphics (InfoVis), vol. 17, no. 12, pp. 2291–2300, doi:10.1109/TVCG.2011.250, 2011.

53. Markus Steinberger, Manuela Waldner, Marc Streit, **Alexander Lex**, Dieter Schmalstieg. *Context-Preserving Visual Links.* IEEE Transactions on Visualization and Computer Graphics (InfoVis'11), vol. 17, no. 12, pp. 2249–2258, doi:10.1109/TVCG.2011.183, 2011. **IEEE InfoVis 2011 Best Paper Award**

54. Thomas Geymayer, **Alexander Lex**, Marc Streit, Dieter Schmalstieg. *Visualizing the Effects of Logically Combined Filters*. IEEE Computer Society Press Proceedings of the Conference on Information Visualisation (IV), pp. 47–52, doi:10.1109/IV.2011.52, 2011.

55. **Alexander Lex**, Marc Streit, Ernst Kruijff, Dieter Schmalstieg. *Caleydo: Design and Evaluation of a Visual Analysis Framework for Gene Expression Data in its Biological Context*. Proceedings of IEEE Pacific Visualization Symposium (PacificVis), pp. 57–64, doi:10.1109/PACIFICVIS.2010.5429609, 2010.

56. **Alexander Lex**, Marc Streit, Christian Partl, Karl Kashofer, Dieter Schmalstieg. *Comparative Analysis of Multidimensional, Quantitative Data* . IEEE Transactions on Visualization and Computer Graphics (InfoVis), vol. 16, no. 6, pp. 1027–1035, doi:10.1109/TVCG.2010.138, 2010.

57. Manuela Waldner, Werner Puff, **Alexander Lex**, Marc Streit, Dieter Schmalstieg. *Visual Links across Applications*. Canadian Human-Computer Communications Society Proceedings of the Graphics Interface (GI), pp. 129–136, doi:10.5555/1839214.1839238, 2010. **GI 2010 Best Student Paper Award**

58. Marc Streit, **Alexander Lex**, Michael Kalkusch, Kurt Zatloukal, Dieter Schmalstieg. *Caleydo: Connecting Pathways with Gene Expression*. Bioinformatics, vol. 25, no. 20, pp. 2760–2761, doi:10.1093/bioinformatics/btp432, 2009.

59. Heimo Müller, Robert Reihs, Stefan Sauer, Kurt Zatloukal, Marc Streit, **Alexander Lex**, Bernhard Schlegl, Dieter Schmalstieg. *Connecting Genes with Diseases*. Proceedings of the Conference on Information Visualisation (IV), pp. 323–330, doi:10.1109/IV.2009.86, 2009.

Shortpapers and Workshop Papers

1. Yiren Ding, Jack Wilburn, Hilson Shrestha, Akim Ndlovu, Kiran Gadhave, Carolina Nobre, **Alexander Lex**, Lane Harrison. *reVISit: Supporting Scalable Evaluation of Interactive Visualizations*. IEEE IEEE Visualization and Visual Analytics (VIS), pp. 31-35, doi:10.1109/VIS54172.2023.00015, 2023.

2. Haihan Lin, Ryan A. Metcalf, Jack Wilburn, **Alexander Lex**. *Sanguine: Visual Analysis for Patient Blood Management*. Workshop on Visual Analytics in Healthcare at AMIA (VAHC), 2020.

3. Zach Cutler, Kiran Gadhave, **Alexander Lex**. *Trrack: A Library for Provenance-Tracking in Web-Based Visualizations*. IEEE Visualization Conference (VIS), pp. 116-120, doi:10.1109/VIS47514.2020.00030, 2020.

4. Jen Rogers, Nicholas Spina, Ashley Neese, Rachel Hess, Darrel Brodke, **Alexander Lex**. *Composer: Visual Cohort Analysis of Patient Outcomes*. Workshop on Visual Analytics in Healthcare at AMIA (VAHC 2018), 2018.

5. Thomas Geymayer, Manuela Waldner, **Alexander Lex**, Dieter Schmalstieg. *How Sensemaking Tools Influence Display Space Usage*. The Eurographics Association EuroVis Workshop on Visual Analytics (EuroVA), doi:10.2312/eurova.20171112, 2017.

6. Sean McKenna, **Alexander Lex**, Miriah Meyer. *Worksheets for Guiding Novices through the Visualization Design Process*. IEEE Workshop on Pedagogy of Data Visualization (PDV), doi:10.48550/arXiv.1709.05723, 2017.

7. Carolina Nobre, **Alexander Lex**. *OceanPaths: Visualizing Multivariate Oceanography Data*. The Eurographics Association Proceedings of the Eurographics Conference on Visualization (EuroVis) - Short Papers, doi:10.2312/eurovisshort.20151124, 2015.

8. Manuela Waldner, **Alexander Lex**, Marc Streit, Dieter Schmalstieg. *Design Considerations for Collaborative Information Workspaces in Multi-Display Environments*. Proceedings of Workshop on Collaborative Visualization on Interactive Surfaces (CoVIS'09, VisWeek), pp. 36–39, 2009.

9. Marc Streit, **Alexander Lex**, Heimo Müller, Dieter Schmalstieg. *Gaze-Based Focus Adaption in an Information Visualization System*. IADIS Proceedings of the Conference on Computer Graphics and Visualization and Image Processing (CGVCVIP), 2009.

Selected Abstracts, Posters, and Commentaries

1. Devin Lange, Eddie Polanco, Robert Judson-Torres, Thomas Zangle, **Alexander Lex**, *Loon: Using Exemplars to Visualize Large Scale Microscopy Data*, Abstract and Talk at BioVis at ISMB / ECCV, 2021. **Honorable Mention Award.**

2. Kiran Gadhave, Hendrik Strobelt, Nils Gehlenborg, **Alexander Lex**, *UpSet 2: From Prototype to Tool.* Posters Proceedings of the IEEE Information Visualization Conference (InfoVis), 2019.

3. Ilkin Safarli, **Alexander Lex**, *TaMax: Visualizing Dense Multivariate Networks with Adjacency Matrices.* Posters Proceedings of the IEEE Information Visualization Conference (InfoVis), 2019.

4. Haihan Lin, Carolina Nobre, Amanda Bakian, **Alexander Lex**, *Clipped Graphs: A Compact Time-Series Encoding.* Posters Proceedings of the IEEE Information Visualization Conference (InfoVis), 2019.

5. Dylan Wootton, Ethan Ransom, **Alexander Lex**, *Arctic Explorer: Visualization of Sea-Ice Concentration along Arctic Shipping Routes.* Posters Proceedings of the IEEE Information Visualization Conference (InfoVis), 2019. **Honorable Mention Award.**

6. *Alex Bigelow*, Carolina Nobre, **Alexander** Lex, Miriah Meyer, *Mure.js: Toward Flexible Authoring and Reshaping of Networks.* Posters Proceedings of the IEEE Information Visualization Conference (InfoVis), 2018.

7. Jen Rogers, Nicholas Spina, Ashley Neese, Rachel Hess, Darrel Brodke, **Alexander Lex**, *Composer: Visual Cohort Analysis of Patient Outcomes.* Posters Proceedings of the IEEE Information Visualization Conference (InfoVis), 2018.

8. Carolina Nobre, Nils Gehlenborg, Hilary Coon, **Alexander Lex**, *Lineage: Visualizing Multivariate Clinical Data in Genealogy Graphs.* Posters Proceedings of the IEEE Information Visualization Conference (InfoVis), 2017.

9. Katarína Furmanová, Miroslava Jarešová, Bikram Kawan, Holger Stitz, Martin Ennemoser, Samuel Gratzl, **Alexander Lex**, Marc Streit, *Taggle: Scaling Table Visualization through Aggregation.* Posters Proceedings of the IEEE Information Visualization Conference (InfoVis), 2017.

10. Hendrik Strobelt, Bilal Alsallakh, Joseph Botros, Brant Peterson, Mark Borowsky, Hanspeter Pfister, and **Alexander Lex**: *A Novel Tool for Isoform Visualization.* Poster Proceedings of the 5th Symposium on Biological Data Visualization (BioVis), ISMB, Dublin, Ireland, USA, 2015.

11. **Alexander Lex**, Nils Gehlenborg: *Points of view: Sets and intersections.* Nature Methods, vol. 11, no. 8, pp. 779, 2014.

12. **Alexander Lex**, Nils Gehlenborg, Hendrik Strobelt, Romain Vuillemot, Hanspeter Pfister: *UpSet for Visualizing Intersecting Sets in Biology.* Poster Proceedings of the 4th Symposium on Biological Data Visualization (BioVis), ISMB, Boston, MA, USA, 2014.

13. **Alexander Lex**, Marc Streit, Hans-Jörg Schulz, Christian Partl, Dieter Schmalstieg, Peter J. Park and Nils Gehlenborg: *StratomeX: Enabling Visualization-Driven Cancer Subtype Analysis.* Poster Proceedings of the IEEE Symposium on Biological Data Visualization (BioVis), 2012.

14. Marc Streit, **Alexander Lex**, Hans-Jörg Schulz, Christian Partl, Dieter Schmalstieg, Peter J. Park, Nils Gehlenborg: *Guided Visual Analysis for the Identification of Cancer Subtypes.* The Cancer Genome Atlas' Semi-Annual Steering Committee Meeting, Houston, TX, US, 25-27 April 2012.

15. **Alexander Lex**, Marc Streit, Hans-Joerg Schulz, Christian Partl, Dieter Schmalstieg, Peter J. Park, Nils Gehlenborg: *StratomeX – Integrative Visualization of Tumor Subtypes in Cancer Genomics Data Sets.* EMBO Workshop on Visualizing Biological Data (VizBi), Heidelberg, Germany, 6-8 March 2012.

16. **Alexander Lex**, Peter J. Park and Nils Gehlenborg: *Supporting Subtype Characterization through Integrative Visualization of Cancer Genomics Data Sets.* The Cancer Genome Atlas' 1st Annual Scientific Symposium: Enabling Cancer Research Through TCGA, November 17-18, 2011, Washington, D.C., USA

17. Marc Streit, **Alexander Lex**, Helmut Doleisch, Dieter Schmalstieg: *Does software engineering pay off for research? Lessons learned from the Caleydo project.* Poster at the Eurographics Workshop on Visual Computing for Biomedicine 2010, Leipzig, Germany, July 2010.

18. Gudrun Schmidt-Gann, Katharina Schmid, Monika Uehlein, Joachim Struck, Andreas Bergmann, Dieter Schmalstieg, Marc Streit, **Alexander Lex**, Douw G. van der Nest, Martijn van Griensven and Heinz Redl: *Gene- and Protein Expression Profiling in Liver in a Sepsis-Baboon Model.* 32nd Annual Meeting on Shock, San Antonio, Texas, USA June 6-9, 2009.

Thesis Papers

Doctoral Thesis: Visualization of Multidimensional Data with Applications in Molecular Biology
Advisor: Prof. Dieter Schmalstieg
Co-Advisor: Dr. Nils Gehlenborg, Harvard Medical School
Referee: Prof. Robert Kosara, University of North Carolina at Charlotte
Publication date: March 2012
Best Dissertation Award, Graz University of Technology

Master's Thesis: Exploration of Gene Expression Data in a Visually Linked Environment
Mentor: Prof. Dieter Schmalstieg
Publication date: June 2008

Bachelor's Thesis: Evaluation of Medical Image Viewers and
Architectural Software Design for a Medical Image Viewer
Mentors: Prof. Horst Bischof, Dr. Martin Urschler
Publication date: June 2005

TALKS

For slides, see `http://https://visdesignlab.net/team/lex/#talks`.

Keynote Talks

Provenance as a Bridge Between Data Analysis Modalities
Workshop on Visualization and Provenance Across Domains, IEEE VIS, Melbourne, Australia, 2023-10-24

Visualization in Data Science: Challenges and Opportunities
Celebrating 30 Years of ICG, Graz University of Technology, Graz, Austria, 2023-06-12

Spatial Omics Visualizations: Lessons Learned from Networks and Maps
BioVis@VIS, IEEE VIS, New Orleans, USA (virtual), 2021-10-25

Opportunities for Understanding Semantics of User Interactions
MLUI 2021: Machine Learning from User Interactions for Visualization and Analytics, IEEE VIS, New Orleans, USA (virtual), 2021-10-24

What is Data Visualization and Why Do We Care About it for Biomedical Applications?
May Institute, Computation and statistics for mass spectrometry and proteomics, Northeastern University, Boston, MA, USA, 2019-05-06

Invited Talks

A Hodgepodge of Visualization Research: Provenance, User Studies, Misinformation
Department of Informatics Colloquium, University of Zürich, Zürich, Switzerland, 2024-10-03.
Media and Information Technology (MIT) Seminar, Linköping University, Norrköping, Sweden, 2024-06-03.

Visualization in Oncological Data Science Now and in the Future: From Cancer Cell Microscopy to Reproducible Visual Analysis
Oncological Data Science Symposium, ODSi, Huntsman Cancer Institute, Utah, 2023-02-28

Empirical Evaluation of Complex Interactive Visualization Techniques
SCI VIS Seminar, University of Utah, USA, 2022-08-31.
Institute for Computer Graphics, TU Wien, Vienna, Austria, 2022-06-03.

Literate Visualization: Making Visual Analysis Sessions Reproducible and Reusable.
Visualization Summer School of Zhejiang University, China (virtual), 2022-07-07.
VRVis Zentrum für Virtual Reality und Visualisierung, Vienna, Austria, 2022-03-24.
Graz University of Technology, Graz, Austria, 2021-11-11.
Séminaire LIRIS, CNRS / INSA Lyon / Université Lyon / École Centrale de Lyon, Lyon, France, 2021-10-18.
Visualization of Biological Data, Dagstuhl Seminar, Schloss Dagstuhl, Germany, 2021-10-04.
Datavisyn Public Lecture Series, datavisyn, Linz, Austria, 2021-07-02.
ICG Lab Talk, Johannes Kepler University, Linz, Austria, 2021-06-15.
Department of Computer Science, City University London, London, UK (virtual), 2020-11-17.
Goldman Sachs Tech Expo, Salt Lake City, UT, USA, 2020-07-24.
Utah Center for Data Science Seminar, 2020-01-06.

Driving Scientific Discovery with Interactive Visual Data Analysis.
Department of Computer Science, University of Copenhagen, Denmark, 2021-10-04.
Institute for Science and Technology (IST) Austria, Klosterneuburg, Austria, 2020-02-25.

Spatial Omics Visualizations: Lessons Learned from Networks and Maps
Worcester Polytechnic Institute, BCB Seminar Series, 2021-12-09

A Framework for Creative Visualization-Opportunities Workshops.
NIH-NCI Workshop on Accelerating Cancer Research through User-Centered Software Design, Washington, DC, USA, 2019-01-07.

Enabling Scientific Discovery through Interactive Visual Data Analysis
Adobe, Lehi, UT, USA, 2019-04-10.
Lucid Software, Salt Lake City, UT, USA, 2019-03-12.

Visualizing Biological Data: Pathway Graphs, Genealogies, and Alternative Splicing
Helmholtz Diabetes Center, Munich, Germany, 2018-10-29.
Translational Genomics Research Institute (TGen), Phoenix, AZ, 2018-08-14.
Association for Molecular Pathology (AMP) Annual Meeting, Salt Lake City, UT, 2017-11-17.
Merck Research Laboratories, Boston, MA, 2017-06-15.
Department Of Biomedical Informatics, Harvard Medical School, Boston, MA, 2017-06-14.

Lineage: Visualizing Multivariate Clinical Data in Genealogy Graphs
NIH-NCI Workshop on Accelerating Cancer Research through User-Centered Software Design, Washington, DC, USA, 2019-01-07.
Genome Rounds, University of Utah, SLC, UT, USA, 2018-08-24.
Department of Psychiatry, University of Utah, SLC, UT, USA, 2018-06-05.
BioIT World Conference & Expo, Boston, MA, USA, 2018-05-17.
Harvard John A. Paulson School of Engineering and Applied Sciences, Harvard University, Cambridge, MA, USA, 2018-05-16.

Layout Adaption Strategies for Visualizing Multivariate Network
University of Calgary, Calgary, AB, Canada, 2018-06-18.

Enabling Scientific Discovery through Interactive Visual Data Analysis
Goldman Sachs Tech Expo, Salt Lake City, UT, 2017-06-28.
Department Of Biomedical Informatics, University of Utah, Salt Lake City, UT, 2017-04-06.
Walmart, Tech Tuesday, Bentonville, AK, 2017-02-07.
Marth Lab, Department of Human Genetics, University of Utah, Salt Lake City, UT, 2016-08-25.
Pacific Northwest National Laboratory, Richland, WA, 2016-07-01.
Huntsman Cancer Institute, Salt Lake City, UT, 2016-03-30.
Camp Lab, Huntsman Cancer Institute, University of Utah, Salt Lake City, UT, 2015-11-23.

Enabling Scientific Discovery through Interactive Visual Data Analysis
University of Vienna, Vienna, Austria, 2015-08-07.
Adobe Research, San Francisco, CA, USA, 2015-04-06.
EPFL, Lausanne, Switzerland, 2015-03-26.
University of Utah, Salt Lake City, UT, USA, 2014-12-03.
University of St. Andrews, St. Andrews, Scotland, 2014-11-03.

UpSet: Visualization of Intersecting Sets
Data Ventures, Harvard University, Cambridge, MA, USA, 2015-04-23.
BioIT World Conference & Expo, Boston, MA, USA, 2015-04-22.
Tufts University, Sommerville, MA, USA, 2014-10-29.

Visual Data Analysis for Biology and Pharmacology
PerkinElmer, Boston, MA, USA, 2014-11-05.
Novartis Institutes for BioMedical Research, Cambridge, MA, USA, 2014-07-09.

Visualizing Relationships between Biological Pathways
Drug Discovery on Target Conference, Boston, MA, USA, 2014-10-08.
BioIT World Conference & Expo, Boston, MA, USA, 2014-05-01.
DBMI, Harvard Medical School, Boston, MA, USA, 2014-04-17.

Visualization Approaches for Biomolecular Data
Georgia Tech, School of Interactive Computing, Atlanta, GA, USA, 2014-04-08.
University of Calgary, Department of Computer Science, Calgary, AB, Canada, 2014-02-13.
MIT CSAIL, Cambridge, MA, USA. 2013-04-12.
UMass Lowell, Lowell, MA, USA, 2013-11-06.

Visualizing Multi-Attribute Rankings & A Very Short Visualization Introduction
Harvard Graduate School of Education, Strategic Data Project, Cambridge, MA, USA, 2014-03-07.

Data Visualization in Molecular Biology
Novartis Institutes for BioMedical Research, Cambridge, MA, USA, 2013-07-29

enRoute: Dynamic Path Extraction from Biological Pathway Maps for Exploring Heterogeneous Experimental Datasets
BioIT World Conference & Expo, Boston, MA, USA, 2013-04-10.
Visualizing Biological Data (VIZBI) 2013, Cambridge, MA, USA, 2013-03-20.
Symposium on Understanding Cancer Genomics through Information Visualization at Tokyo University, Tokyo, Japan, 2013-02-22.

Visualizing Biomolecular Data with the Caleydo Framework
CBMI, Harvard Medical School, Boston, MA, USA, 2011-08-12.
MRC Laboratory of Molecular Biology (LMB), Cambridge, UK, 2010-09-21.
European BioInformatics Institute (EBI), Cambridge, UK, 2010-09-20

Caleydo: Visual Analysis of Biomolecular Data
VCBM 2010 Leipzig, Germany, 2010-07-02.
Caleydo and Visual Links.
VRVis Research Company, Vienna, Austria, 2010-03-11.

Caleydo: Visualization of Gene Expression Data in the Context of Biological Processes
AUVA Research Center for Traumatology, Vienna, Austria, 2009-02-26.

Novel InfoVis Techniques Applied to Pathways and Gene Expression Data
Institute for Genomics and Bioinformatics, Graz University of Technology, Austria, 2008-07-10.

Paper/Poster Talks

Persist: Persistent and Reusable Interactions in Computational Notebooks
EuroVis, Odense, Denmark, 2024-05-30

Pathfinder: Visualizing Paths in Graphs (Poster)
BioVis @ ISMB, Orlando, FL, USA, 2016-07-08.

UpSet: Visualization of Intersecting Sets
IEEE InfoVis, Paris, France, 2014-11-03.

StratomeX: Visual Analysis of Large-Scale Heterogeneous Genomics Data for Cancer Subtype Characterization
IEEE BioVis 2012, Seattle, Washington, USA, 2012-10-14. (Poster)
EuroVis 2012, Vienna, Austria, 2012-06-07.

VisBricks: Multiform Visualization of Large, Inhomogeneous Data
IEEE InfoVis 2011, Providence, Rhode Island, USA, 2011-10-26.

Visualizing the Effects of Logically Combined Filters
Information Visualization 2011, London, UK. 2011-07-14.

Comparative Analysis of Multidimensional, Quantitative Data
IEEE InfoVis 2010, Salt Lake City, Utah, USA. Paper presentation, 2010-10-28.

Caleydo: Design and Evaluation of a Visual Analysis Framework for Gene Expression Data in its Biological Context
PacificVis 2010, Taipei, Taiwan. 2010-03-03.

Panels

VA is Driven by Systems.
Panel: What is a Visual Analytics contribution, and how is it changing? IEEE VIS, 2023-10-25

Ethics, Reviewing and Discussion Culture at VIS
Panel: Is This (Panel) Good Enough for IEEE VIS?, IEEE VIS, 2022-10-21.

How Can We Ensure Fair Pay for Study Participants?
Panel: Wait...when did we sign up to be economists?, IEEE VIS, 2021-10-29.

Visualization Response in a Time of Pandemic
Panel at VisGuides: 3rd Workshop on the Creation, Curation, Critique and Conditioning of Principles and Guidelines in Visualization, IEEE VIS, 2020-10-25.

SELECTED SOFTWARE

Usable software systems are a major part of my research output. To ensure software quality and to free up students to work on research project, I currently employ four staff software engineers. I have released a wide range of biomedical visualization tools under permissive open source license. Here is a list of the most recent and popular tools.

UpSet, a set visualization technique. UpSet has been accessed by more than 100,000s of users. The technique has been re-implemented more than 15 times in various programming languages.
`http://upset.app`

UpSetR, an R version of UpSet. UpSetR has been downloaded more than 1.5 million times.
`https://github.com/hms-dbmi/UpSetR`

reVISit, a framework for designing online user studies.
`https://revisit.dev/`

MultiNet, a multivariate network visualization platform.
`https://multinet.app/`

Trrack, a provenance tracking library for web-applications.
`https://github.com/trrack/`

Loon, a tool for analyzing cancer microscopy data.
https://loon.sci.utah.edu/

The **LineUp** Ranking Visualization Tool. LineUp has been integrated into Microsoft Power BI and is the basis of the product of datavisyn, a spin-off company I co-founded.
https://lineup.js.org/app/

The **Lineage** Visualization Tool for Clinical Genealogies.
https://lineage.caleydoapp.org/

The **Juniper** Multivariate Network Visualization Tool.
http://juniper.sci.utah.edu/

The **Pathfinder** Network Visualization Tool.
https://pathfinder.caleydoapp.org/

The **Vistories** Provenance Tracking and Storytelling Tool.
http://vistories.org/

Various other libraries and tools are accessible at http://github.com/visdesignlab/.

MEDIA EXPOSURE

TU Graz News, 2025
Alexander Lex: How can data be communicated more effectively?

SCI Institute and @TheU, 2024
NSF-Funded Team Launches reVISit – Pioneering Open-Source Software for Visualization Research

Inside Science, 2017
How Math Can Help Geologists Discover New Minerals

The OpenHelix Blog, 2016
Video Tip of the Week: Pathfinder, for exploring paths through data sets

The OpenHelix Blog, 2014
Video Tip of the Week: UpSet about genomics Venn Diagrams?

The Harvard Crimson, 2014
Painting by the Numbers: Data Visualization

The Harvard Crimson, 2014
New Tool Makes Cancer Analysis More Accessible

Harvard Medical School News, 2014
Pattern Recognition: New visualization software uncovers cancer subtypes

GenomeWeb, 2014
Harvard TCGA Data Visualization Software Adds Tools to Better Characterize Disease Subtypes

The OpenHelix Blog, 2014
StratomeX for genomic stratification of diseases

Harvard SEAS News & Harvard Gazette, 2014
What's behind a #1 ranking?

Forbes, 2014
Harvard And DARPA Develop Software For Deconstructing Top 100 Rankings

Der Standard, 2014
Heimische Forscher machen die Dynamik hinter Rankings sichtbar

The OpenHelix Blog, 2014
Video Tip of the Week: Entourage and enRoute from the Caleydo team

Nature Methods, 2013
Data visualization: ambiguity as a fellow traveler

GEN - Genetic Engineering & Biotechnology News, 2013
Pathway Analysis to Decipher Data

Harvard SEAS News, 2013
Celebrating minds dedicated to discovery

The OpenHelix Blog, 2010
Tip of the Week: Caleydo for gene expression and pathway visualization

For links to the articles, see `http://visdesignlab.net/team/lex/#press`.

TEACHING AND MENTORSHIP

Courses Taught

Human Centered Data Analysis, Graz University of Technology, Winter 2025.
Instructor. Graduate research course.

CS 4500 — Senior Capstone Project, University of Utah, Spring 2025.
Co-Instructor.

COMP 5960 — Applied Data Visualization, University of Utah, Fall 2023, Fall 2024.
Instructor. Graduate course designed for non CS students. `https://www.dataviscourse.net/2024-applied/`

CS 4011 — Professional Development, University of Utah, Fall 2024.
This course prepares students for the process of entering the software developer job market.

CS 6957 — Human Centered Data Analysis, University of Utah, Spring 2023.
Instructor. Graduate research course.

CS 5630/CS 6630 — Visualization for Data Science, University of Utah, Fall 2017–2020, 2022.
Instructor. Graduate/undergraduate course on visualization covering visualization fundamentals, information visualization, and the development of web-based visualization tools. `http://dataviscourse.net`

COMP 5360/MATH 4100 — Introduction to Data Science, University of Utah, Spring 2018, 2019, 2020, 2021. Instructor. Undergraduate course on data science. `http://datasciencecourse.net`

CS 5963/Math 3900 — Introduction to Data Science, University of Utah, Fall 2016
Instructor. Undergraduate course on the fundamentals of data science. `http://datasciencecourse.net`

CS 5630/CS 6630 — Visualization, University of Utah, Fall 2015, 2016
Instructor. Graduate/undergraduate course on visualization covering fundamentals, information visualization and scientific visualization. `http://dataviscourse.net`

CS 7942 — Visualization Seminar, University of Utah, Fall 2016, Spring 2017, Fall 2017, Spring 2018

CS 171 — Visualization, Harvard University, Spring 2015
Instructor. Undergraduate level lecture on visualization. `http://cs171.org/2015/`

CS 171 — Visualization, Harvard University, 2013, 2014
Head teaching fellow. Instructor: Hanspeter Pfister.
Responsibilities: co-developed class, taught multiple lectures and supervised 15 teaching fellows.

BioVis — Visualization in Molecular Biology, Johannes Kepler University Linz, 2013
Instructor. Lecture series sponsored by an "Excellence in Teaching" scholarship, state of Upper Austria. Graduate lecture on visualization for molecular biology.

CS 109 / AC 209 / Stat 121 / E-109 — Data Science, Harvard University, 2013
Teaching fellow. Instructors: Hanspeter Pfister and Joe Blitzstein. Undergraduate and graduate lecture on data analysis using statistics, machine learning and visualization.

Selected Topics Computer Graphics, Graz University of Technology, 2010, 2011, 2012
Co-Instructor. Graduate level lectures on perception, color, information visualization, visual analytics, flow visualization.

Distributed Systems, Graz University of Technology, 2009, 2010, 2011
Teaching assistant. Undergraduate level. Development and supervision of lab assignments.

Introduction to Scientific Work, Graz University of Technology, 2010, 2011
Teaching assistant. Undergraduate level. Supervision of focus groups.

Computer Graphics 1, Graz University of Technology, 2011, 2012
Teaching assistant. Undergraduate level. Development and supervision of lab assignments.

Computer Graphics 2, Graz University of Technology, 2011, 2012
Teaching assistant. Undergraduate level. Development and supervision of lab assignments.

Tutorials

Jack Wilburn, Hilson Shrestha, Zach Cutler, Yiren Ding, Andrew McNutt,
Lane Harrison, **Alexander Lex**:
Running Online User Studies with the reVISit Framework
VIS 2025, Austria, November 2025
EuroVis 2025, Luxembourg, June 2025
CHI 2025, Japan, April 2025
UNC Chapel Hill, March 12 2025
University of Utah, February 5, 2025
Georgia Tech, January 2025
IEEE VIS, Tampa, Florida, USA, 2024

Carolina Nobre, Marc Streit, **Alexander Lex**:
Visualizing Multivariate Networks
IEEE VIS, Vancouver, Canada, 2019

Nils Gehlenborg and **Alexander Lex**:
StratomeX & enRoute: Integrative Visualization with Caleydo.
Visualizing Biological Data (VizBi) 2013, Cambridge, MA, USA, 2013

Alexander Lex and Marc Streit:
Cancer Data Analysis with Caleydo StratomeX and enRoute.
Symposium on Understanding Cancer Genomics through Information Visualization at Tokyo University, Tokyo, Japan, 2013

Marc Streit, Hans-Jörg Schulz and **Alexander Lex**:
Connecting the Dots — Showing Relationships in Data and Beyond.
VisWeek'12, Seattle, WA, USA, 2012.

Graduated Ph.D. Students

Maxim Lisnic, 2021–2025, now Faculty at WPI, co-advised with Marina Kogan

Devin Lange, 2019–2024, now PostDoc at Harvard Medical School

Kiran Gadhave, 2018–2024, now Research Engineer at Imply

Haihan Lin, 2018–2023, now Software Engineer at Lucid

Jennifer Rogers, 2017–2022, co-advised with Miriah Meyer since 2019, now Research Scientist at Idaho National Laboratory

Carolina Nobre, 2016–2020, now Faculty at University of Toronto

Christian Partl (TU Graz), 2013–2018, co-advised with Dieter Schmalstieg

Current Ph.D. Students

Zach Cutler, 2023–2028

Khandaker Abrar Nadib, 2024–2029, co-advised with Marina Kogan

Current and Former PostDocs

Tingying He, Since 2024

Devin Lange, 2024–2025

Current Staff Members

Jack Wilburn, Senior Software Engineer

Jake Wagoner, Software Engineer

Jay Kim, Software Engineer

Luke Schreiber, Software Engineer

M.S. Students Advised at Utah

Shaurya Sahai, independent study, MS '21

Sai Varun, independent study, MS '20

Sreekanth Reddy Konda, independent study, MS '19

Ram Seethamraju, independent study, MS '19

Sheetal Krishna, independent study, MS '19

Pranav Dommata, independent study, MS '18

Sunny Hardasani, independent study, MS '16

Anirudh Narasimhamurthy, independent study, M.S. '16

Murali Krishna Teja Kilari, independent study, M.S. '17

Sateesh Tata, independent study, MS '16

Shreya Singh, independent study, MS '15

Varsha Alangar, independent study, MS '15

I have worked on at least a semester-long project with each of the MS students listed above. I have funded four of these students as RAs. I am not listing committee chairing or membership for course-only students.

Undergraduate Students Advised at Utah

Zoe Exelbert, BS Thesis, BS '25

Luke Schreiber, BS '24

Marko Miholjcic, BS '21

Sunny Siu, NSF REU, BS '21, MS '22

Hannah Burns, NSF REU, BS '21

Pranav Rajan, NSF REU, BS '21

Zachary Cutler, UROP Student / RA, BS '20, MS '21

Dylan Wooton, Independent Research, BS '19

Roy Bastien, BS Thesis, BS '16

Priyanka Parekh, BS Thesis, BS '16

PhD Committees at Utah

Thomas Greger, 2022-2027, Chair: Kogan

Sayef Azad Sakin, 2022-2025, Chair: Isaacs

Connor Francis Scully-Allison, 2022-2025, Chair: Isaacs

Cole Polychronis, 2019-2024, Chair: Kogan

Youjia Zhou, 2018-2023, Chair: Wang

Di Wang, 2018-2023, Chair: Kogan

Trang Tran, 2016-2021, Chair: Might

Zhimin Li, 2016-2024, Chair: Pascucci

Saeed Taheri, 2015-2021, Chair: Gopalakrishnan

Jimmy Moore, 2015-2021, Chair: Meyer

Nina McCurdy, 2014-2019, Chair: Meyer

P. Samuel Quinan III, 2013-2019, Chair: Meyer

Alex Bigelow, 2013-2019, Chair: Meyer

Ethan Kerzner, 2013-2018, Chair: Meyer

Sean McKenna, 2012-2017, Chair: Meyer

Other PhD Committees

Yiren Ding, WPI, Chair: Lane Harrison

Trevor Manz, Harvard Medical School, Chair: Nils Gehlenborg

Other Mentored Students at Utah

Ishrat Jahan Eliza, PhD Student, 2023-2024

Filemon Mateus, PhD fellowship rotation '23

Moataz Abdelaal, visiting PhD Student, '22

Max Marno, PhD fellowship rotation '20

Ilkin Safarli, PhD student, 2018-2020

Jochen Görtler, visiting PhD Student, '19

Cameron Waller, PhD student, 2016-2018, co-supervised with Jared Rutter

Sahar Mehrpour, PhD fellowship rotation '17

Mengjiao Han, PhD fellowship rotation '17

Asmaa Aljuhani, PhD fellowship rotation '17

Annie Cherkaev, PhD fellowship rotation '17

Michael Kern, visiting MS student '16

Mentored Students at Harvard

Rasvan Iliescu, master's thesis, MS '14

Alain Ibrahim, master's thesis, MS '14

Tamar Rucham, master's thesis, MS '14

Gabriel Hase, master's thesis, MS '14

Conor Myhrvold, MS '14

Ran Sofia Hou, undergraduate thesis, BS '13 (co-advised with Joe Blitzstein)

Mentored Students at Graz University of Technology

Thomas Geymayer, MS '12, BS '11 (with D. Schmalstieg)

Christian Partl, MS '12 (with D. Schmalstieg)

Michael Lafer, BS '10 (with D. Schmalstieg)

Hannes Plank, BS '11 (with D. Schmalstieg)

Jürgen Pillhofer, MS '10 (with D. Schmalstieg)

Michael Wittmayer, BS '09 (with D. Schmalstieg)

Helmut Pichlhöfer, BS '10 (with D. Schmalstieg)

Oliver Pimas, BS '10 (with D. Schmalstieg)

Bernhard Schlegl, MS '09 (with D. Schmalstieg)

Werner Puff, MS '10 (with D. Schmalstieg)

Christian Partl, BS '09 (with D. Schmalstieg)

Stefan Sauer, BS '09 (with D. Schmalstieg)

SERVICE

Department Service

Director of Graduate Studies, 2022–2025

SCI Visualization Faculty Search Committee Chair, 2023

SCI/DBMI Faculty Search Committee Co-Chair, 2022

Scientific Visualization Faculty Search Committee, 2022

Large Scale Visualization Faculty Search Committee, 2022

AI Search Committee, 2021

Curriculum Committee, 2020–2021

Software Development Degree Curriculum Committee, 2019–2021

Data Science Degree Curriculum Committee, 2019–2021

Associate Director for Graduate Studies, 2018–2021

Leading Restructuring of Software Engineering at SCI, 2019

Programming Languages Search Committee, 2018

Database Search Committee, 2017

Graduate Student Advisory Council Faculty Liaison, 2017–2019

Graduate Students Admissions Committee, 2016–2018

Organized Conferences and Workshops

Co-chair of Symposium on Visualization in Data Science (VDS) at IEEE VIS 2017

Co-chair of Workshop on Visualization in Data Science (VDS) at IEEE VIS 2016

Editorial and Paper Chair Roles

Associate editor, IEEE TVCG, Since 2023

Area papers co-chair at IEEE VIS (area: Theoretical & Empirical), 2023

Associate editor, IEEE CG&A, Since 2022

Area papers co-chair at IEEE VIS (area: Applications), 2021

Short-papers co-chair at IEEE VIS, 2020

Papers co-chair of Symposium on Biological Data Visualization (BioVis), ISMB, 2017, 2019

Papers and program co-chair of Symposium on Visualization in Data Science (VDS) at IEEE VIS 2015

Other Leadership Roles at Conferences

Co-chair of the IEEE VIS Area Curation Committee, 2024

Member of the IEEE VIS Area Curation Committee, 2023

Member of reVISe, a committee tasked with developing proposals to restructure IEEE VIS, 2019, 2020

Steering committee member of Symposium on Visualization in Data Science (VDS), 2018–2022

Supporters chair of IEEE VIS 2018, 2019

Publications chair of BioVis 2016

Publicity co-chair of IEEE VIS 2016, 2017

Poster co-chair of Symposium on Biological Data Visualization (BioVis) 2014, 2015

Website co-chair of Symposium on Biological Data Visualization (BioVis) 2014, 2015

Program Committees

EuroVis 2021, 2026

ACM CHI, 2018, 2019, 2026

IEEE InfoVis 2014, 2015, 2016, 2019, 2020

IEEE VAST, 2017, 2018

Visual Analytics in Health Care, 2019

Visualization in Data Science (VDS), 2018

PacificVis, 2016, 2017

International Symposium on Big Data Visual Analytics (BDVA), 2016

BioVis, 2014, 2015, 2016

EuroVis Short Papers, 2014, 2015, 2016, 2017

Conference on Human-Computer Interaction & Knowledge Discovery (HCI-KDD), 2012

International Conference on Information Visualisation (IV), 2010, 2011

Grant Review Panels

National Science Foundation (NSF), 2024

The Dutch Research Council, 2023

National Science Foundation (NSF), 2022

National Cancer Institute (NCI), National Institutes of Health (NIH), 2020

National Science Foundation (NSF), 2018 (three times)

OUTREACH ACTIVITIES

I offer courses about data visualization to the general public and companies. Is also provide self-study material on developing web-based visualizations.

January 4, 2026