

Alexander Lex

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Biography

Alexander Lex is an Assistant Professor of Computer Science at the Scientific Computing and Imaging Institute and the School of Computing at the University of Utah. Alex co-directs the Visualization Design Lab and conducts research on visualization methods and systems to help solve today's data analysis problems in the biomedical sciences. Alex is a co-founder of datavisyn, a company developing visual analytics solutions for the pharmaceutical industry, and a member of the Huntsman Cancer Institute.

Before joining the University of Utah, he was a lecturer and post-doctoral researcher at Harvard University. He received his PhD, master's, and undergraduate degrees from the Graz University of Technology, and was a visiting researcher at the Department for Biomedical Informatics at Harvard Medical School. Alex is the recipient of an NSF CAREER award and multiple best paper awards or honorable mentions at IEEE VIS, ACM CHI, BioVis, and other conferences. He also received a best dissertation award from his alma mater.

Research Interest

Interactive data visualization, bioinformatics, visualization for biomedicine, data analysis methods for scientists and experts, visual analytics, human computer interaction, data science.

Professional Appointments

University of Utah

Faculty Member at the Scientific Computing and Imaging Institute.
Assistant Professor at the School of Computing.
Member of the Huntsman Cancer Institute.

Since 07/2015

datavisyn

Co-Founder and *Advisor*.
Datavisyn develops visual data analysis solutions for the pharmaceutical industry.
<http://datavisyn.io>

Since 12/2017

Harvard University

Post-Doctoral Fellow at the Visual Computing Group at the School of Engineering & Applied Sciences. Research on interactive analysis of heterogeneous and large data for scientists and experts.
Leading the visualization group, 07/2014 – 05/2015.
Lecturer, teaching CS 171, Visualization, 01/2015 – 05/2015.

10/2012 – 05/2015

Graz University of Technology

Post-Doctoral Researcher. Senior researcher in the information visualization group. Co-leader of the Caleydo project. Research in visualization and HCI with a focus on molecular biology applications, such as pathway analysis, cancer subtype analysis, heterogeneous and multiple datasets.

03/2012 – 09/2012

Department for Biomedical Informatics at Harvard Medical School

Visiting Researcher. Designed and implemented visualization and interaction techniques for cancer subtype analysis.

08/2011 – 09/2011

Graz University of Technology

Lecturer (“Universitätsassistent”). Teaching courses on visualization, distributed systems, computer graphics. Student supervision.

08/2010 – 09/2012

Graz University of Technology 08/2008 – 07/2012
Research Assistant. Designed and developed the Caleydo Visualization framework.
Focus on microarray data analysis and pathway visualization.

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

Visiting Graduate Student 09/2006 – 05/2007
McMaster University, Hamilton, ON, Canada

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

Merit-Review Based Grant Funding at the University of Utah

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

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.

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

cTracks: Visualizing Copy Number Data. Funded by ARUP Laboratories, 2018-2019. \$ 47,218.

Visualizing Copy Number Data. Funded by ARUP Laboratories, 2017. \$ 84,280.

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.

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 at Harvard University and 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.

Joint Study scholarship for student exchange with McMaster University, Hamilton, On, Canada. 2006.

Honors and Awards

Honorable Mention Award (top 3 paper out of 183 submissions), EG/VGTC EuroVis, 2016.

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

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

Honorable Mention Award (top 5% paper, 3200 submissions), ACM CHI, 2014.

Best Paper Award (of 152 submissions), IEEE InfoVis, 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, 2012.

3rd Best Paper Award (of 202 submissions), IEEE/EG EuroVis, 2012.

Best Paper Award (of 172 submissions), IEEE InfoVis, 2011.

Best Student Paper Award (of 88 submissions), ACM Graphics Interface, 2010.

Award for excellent performance as a student (“Leistungsstipendium”) granted by the Faculty of Computer Science, Graz University of Technology, 2007.

Peer-reviewed Journal Publications

Students primarily supervised by me at the University of Utah are underlined, other Utah students are italic.

1. Carolina Nobre, Marc Streit, **Alexander Lex**, *Juniper: A Tree+Table Approach to Multivariate Graph Visualization*, IEEE Transactions on Visualization and Computer Graphics (InfoVis '18), vol. 25, no. 1, 2019.
2. Carolina Nobre, Nils Gehlenborg, Hilary Coon, **Alexander Lex**, *Lineage: Visualizing Multivariate Clinical Data in Genealogy Graphs*. IEEE Transactions on Visualization and Computer Graphics, early access, 2018.
3. 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, 2017. **corresponding author*
4. Jake R. Conway, **Alexander Lex**, Nils Gehlenborg, *UpSetR: An R Package For The Visualization Of Intersecting Sets And Their Properties*. Oxford Bioinformatics, vol. 33, no. 18, pp. 2938-2940, 2017.
5. *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 '17), vol. 36, no. 3, pp. 251-260, 2017.
6. Christian Partl, Samuel Gratzl, Marc Streit, Anne Mai Wassermann, Hanspeter Pfister, Dieter Schmalstieg, and **Alexander Lex**, *Pathfinder: Visual Analysis of Paths in Graphs*. Computer Graphics Forum (EuroVis '16), vol. 35, no. 3, pp. 71-80, 2016. **Honorable Mention Award**.
7. Samuel Gratzl, **Alexander Lex**, Nils Gehlenborg, Nicola Cosgrove, and Marc Streit, *From Visual Exploration to Storytelling and Back Again*. Computer Graphics Forum (EuroVis '16), vol. 35, no. 3, pp. 491-500, 2016.
8. Hendrik Strobel, Bilal Alsallakh, Joseph Botros, Brant Peterson, Mark Borowsky, Hanspeter Pfister, and **Alexander Lex**, *Vials: Visualizing Alternative Splicing of Genes*. IEEE Transactions on Visualization and Computer Graphics (InfoVis '15), vol. 22, no. 1, pp. 399-408, 2016.
9. Marc Streit*, **Alexander Lex***, Samuel Gratzl, Christian Partl, Dieter Schmalstieg, Hanspeter Pfister, Peter J. Park, and Nils Gehlenborg, *Guided visual exploration of genomic stratifications in cancer*. Nature Methods, vol. 11, no. 9, pp. 884–885, 2014. **equal contribution*
10. **Alexander Lex**, Nils Gehlenborg, Hendrik Strobel, Romain Vuillemot, and Hanspeter Pfister, *UpSet: Visualization of Intersecting Sets*. IEEE Transactions on Visualization and Computer Graphics (InfoVis '14), vol. 20, no. 12, pp. 1983–1992, 2014.
11. Christian Partl, **Alexander Lex**, Marc Streit, Hendrik Strobel, Anne Mai Wasserman, Hanspeter Pfister, and Dieter Schmalstieg, *ConTour: Data-Driven Exploration of Multi-Relational Datasets for Drug Discovery*. IEEE Transactions on Visualization and Computer Graphics (VAST '14), vol. 20, no. 12, pp. 1883–1892, 2014.
12. Samuel Gratzl, Nils Gehlenborg, **Alexander Lex**, Hanspeter Pfister, and Marc Streit, *Domino: Extracting, Comparing, and Manipulating Subsets across Multiple Tabular Datasets*. IEEE Transactions on Visualization and Computer Graphics (InfoVis '14), vol. 20, no. 12, pp. 2023–2032, 2014. **Honorable Mention Award**.
13. Cagatay Turkyay, **Alexander Lex**, Marc Streit, Hanspeter Pfister, and Helwig Hauser, *Characterizing Cancer Subtypes using the Dual Analysis Approach in Caleydo*. IEEE Computer Graphics and Applications, vol. 34, no. 2, pp. 38–47, Mar. 2014.
14. **Alexander Lex**, Christian Partl, Denis Kalkofen, Marc Streit, Anne Mai Wasserman, Samuel Gratzl, Dieter Schmalstieg, and Hanspeter Pfister, *Entourage: Visualizing Relationships between Biological Pathways using Contextual Subsets*. IEEE Transactions on Visualization and Computer Graphics (InfoVis '13), vol. 19, no. 12, pp. 2536–2545, 2013.

15. Samuel Gratzl, **Alexander Lex**, Nils Gehlenborg, Hanspeter Pfister, and Marc Streit, *LineUp: Visual Analysis of Multi-Attribute Rankings*. IEEE Transactions on Visualization and Computer Graphics (InfoVis '13), vol. 19, no. 12, pp. 2277–2286, 2013. **Best Paper Award**.
16. Christian Partl, **Alexander Lex**, Marc Streit, Denis Kalkofen, Karl Kashofer, and Dieter Schmalstieg, *enRoute: Dynamic Path Extraction from Biological Pathway Maps for Exploring Heterogeneous Experimental Datasets*. BMC Bioinformatics, vol. 14, no. Suppl 19, p. S3, Nov. 2013.
17. **Alexander Lex**, Marc Streit, Hans-Jörg Schulz, Christian Partl, Dieter Schmalstieg, Peter J. Park and Nils Gehlenborg, *StratomeX: Visual Analysis of Large-Scale Heterogeneous Genomics Data for Cancer Subtype Characterization*. Computer Graphics Forum (EuroVis '12), pp. 1175-1184, 31(3), June 2012. **3rd Best Paper Award**.
18. 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, pp.998-1010, 18(6), 2012.
19. **Alexander Lex**, Hans-Jörg Schulz, Marc Streit, Christian Partl and Dieter Schmalstieg, *VisBricks: Multiform Visualization of Large, Inhomogeneous Data*. IEEE Transactions on Visualization and Computer Graphics (InfoVis'11), pp. 2291-2300, 17(12), Dec. 2011.
20. Markus Steinberger, Manuela Waldner, Marc Streit, **Alexander Lex** and Dieter Schmalstieg, *Context-Preserving Visual Links*. IEEE Transactions on Visualization and Computer Graphics (InfoVis'11), pp. 2249-2258, 17(12), Dec. 2011. **Best Paper Award**.
21. **Alexander Lex**, Marc Streit, Christian Partl, Karl Kashofer, Dieter Schmalstieg, *Comparative Analysis of Multidimensional, Quantitative Data*. IEEE Transactions on Visualization and Computer Graphics (InfoVis'2010), 16(6), pp. 1027-1035, Nov.-Dec. 2010
22. Marc Streit, **Alexander Lex**, Michael Kalkusch, Kurt Zatloukal, Dieter Schmalstieg, *Caleydo: Connecting Pathways with Gene Expression*. Bioinformatics, Oxford Journals, 25(20), pp. 2760-2761, 2009.

Peer-reviewed Conference Publications

1. Yan Zheng, Yi Ou, **Alexander Lex**, and Jeff M. Phillips, *Visualization of Big Spatial Data using Coresets for Kernel Density Estimates*. Symposium on Visualization in Data Science (VDS) at IEEE VIS, to appear, 2017.
2. Thomas Geymayer, Markus Steinberger, Marc Streit, **Alexander Lex**, and Dieter Schmalstieg, *Show me the Invisible: Visualizing Hidden Content*. In Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '14), pp. 3705-3714, 2014. **Honorable Mention Award**.
3. John D. Mercer, Balaaji Pandian, **Alexander Lex***, Nicolas Bonneel, and Hanspeter Pfister, *Mu-8: visualizing differences between proteins and their families*. BMC Proceedings, vol. 8, no. Suppl 2, p. S5, 2014. **corresponding author*
4. Christian Partl, **Alexander Lex**, Marc Streit, Denis Kalkofen, Karl Kashofer, and 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 '12), 2012, pp. 107–114, Seattle, WA, USA, Oct. 2012. **Best Paper Award**.
5. Clemens Holzhüter, **Alexander Lex**, Dieter Schmalstieg, Hans-Jörg Schulz, Heidrun Schumann and Marc Streit, *Visualizing Uncertainty in Biological Expression Data*. Proceedings of the SPIE Conference on Visualization and Data Analysis (VDA '12), pp. 82940O, San Francisco, CA, USA, 2012.
6. Thomas Geymayer, **Alexander Lex**, Marc Streit, Dieter Schmalstieg, *Visualizing the Effects of Logically Combined Filters*. Proceedings of the Conference on Information Visualisation (IV'2011), pp. 47-52, London, UK, 2011.
7. Manuela Waldner, Werner Puff, **Alexander Lex**, Marc Streit, Dieter Schmalstieg, *Visual Links across Applications*. Proceedings of the Graphics Interface (GI) 2010, Ottawa, Ontario, Canada, May 31 - June 2 2010. **Best Student Paper Award**.

8. **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 the IEEE Pacific Visualization Symposium, pp. 57-64, Taipei, Taiwan, March 2010.
9. Heimo Müller, Robert Reihls, Stefan Sauer, Kurt Zatloukal, Marc Streit, **Alexander Lex**, Bernhard Schlegl, Dieter Schmalstieg *Connecting Genes with Diseases*. Symposium on Information Visualization in Biomedical Informatics, 13th International Conference on Information Visualization, Barcelona, Spain, July 2009.
10. Marc Streit, **Alexander Lex**, Heimo Müller, Dieter Schmalstieg *Gaze-Based Focus Adaption in an Information Visualization System*. Computer Graphics and Visualization and Image Processing 2009 Conference (CGVCVIP), Algarve, Portugal, June 2009.

Peer-reviewed Workshop Publications and Conference Short Papers

1. 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), to appear, 2018.
2. *Sean McKenna*, **Alexander Lex**, Miriah Meyer, *Worksheets for Guiding Novices through the Visualization Design Process*, Workshop on Pedagogy of Data Visualization at IEEE VIS, to appear, 2017.
3. Thomas Geymayer, Manuela Waldner, **Alexander Lex**, Dieter Schmalstieg, *How Sensemaking Tools Influence Display Space Usage*. EuroVis Workshop on Visual Analytics (EuroVA '17), 2017.
4. Carolina Nobre and **Alexander Lex**, *OceanPaths: Visualizing Multivariate Oceanography Data*. Proceedings of the Eurographics Conference on Visualization (EuroVis '15), Short Papers, 2015.
5. Manuela Waldner, **Alexander Lex**, Marc Streit, Dieter Schmalstieg, *Design Considerations for Collaborative Information Workspaces in Multi-Display Environments*. Proceedings of the CoVIS 2009 Workshop on Collaborative Visualization on Interactive Surfaces (IEEE VisWeek), Atlantic City, USA, October 2009.

Selected Commentaries and Posters

1. *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 '18), Berlin, Germany, 2018.
2. Carolina Nobre, Nils Gehlenborg, Hilary Coon, **Alexander Lex**, *Lineage: Visualizing Multivariate Clinical Data in Genealogy Graphs*. Poster Proceedings of IEEE InfoVis, Phoenix, Arizona, USA, 2017.
3. Katarína Furmanová, Miroslava Jarešová, Bikram Kawan, Holger Stitz, Martin Ennemoser, Samuel Gratzl, **Alexander Lex**, Marc Streit, *Taggle: Scaling Table Visualization through Aggregation*. Poster Proceedings of IEEE InfoVis, Phoenix, Arizona, USA, 2017.
4. 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'15), ISMB, Dublin, Ireland, USA, 2015.
5. **Alexander Lex**, Nils Gehlenborg: *Points of view: Sets and intersections*. Nature Methods, vol. 11, no. 8, pp. 779, 2014.
6. **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'14), ISMB, Boston, MA, USA, 2014.
7. **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'12), 2012.

8. 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.
9. **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.
10. **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
11. 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.
12. 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

Teaching

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

CS 5630/CS 6630 — Visualization for Data Science, University of Utah, Fall 2017, Fall 2018
Instructor. Graduate/undergraduate course on visualization covering visualization fundamentals, information visualization, and the development of web-based visualization tools. <http://dataviscourse.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.

PhD Students

Haihan Lin, 2018-2023

Ilkin Safarli, 2018-2023

Kiran Gadhawe, 2018-2023

Jennifer Rogers, 2017-2022

Carolina Nobre, 2016-2021

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

Other Mentored Students at Utah

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

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

Sunny Hardasani, independent study, MS '16

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

Michael Kern, (on exchange from TU Munich) M.S. '16

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

Sateesh Tata, independent study, MS '16

Roy Bastien, undergraduate thesis, BS '16

Priyanka Parekh, undergraduate thesis, BS '16

Shreya Singh, independent study, MS '15

Varsha Alangar, independent study, MS '15

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)

Tutorials

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

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

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

Paper Chair Roles at Conferences

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

Supporters chair of IEEE VIS 2018, 2019

Steering committee member of Symposium on Visualization in Data Science (VDS) 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

ACM CHI, 2018, 2019

Visualization in Data Science (VDS), 2018

IEEE VAST, 2017, 2018

IEEE InfoVis 2014, 2015, 2016

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

Reviewing

Oxford Bioinformatics

BMC Bioinformatics

BMC Genomics

Nucleic Acids Research

PLOS One

IEEE TVCG

IEEE CG&A

SAGE Information Visualization

IEEE Information Visualization (InfoVis) 2010-2016, 2018

IEEE Visual Analytics (VAST) 2010-2016

ACM CHI 2014-2017

EuroVis 2010-2018
BioVis 2012-2016
IEEE PacificVis 2010, 2011, 2013, 2015, 2016
IV 2009-2011
F1000Research
and others

Grant Review Panels

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

Department Service

Associate Director for Graduate Studies, 2018
Programming Languages Search Committee, 2018
Database Search Committee, 2017
Graduate Student Advisory Council Faculty Liaison, Since 2017
Graduate Students Admissions Committee, 2016, 2017, 2018

Invited Talks

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

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.

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University of Calgary, Calgary, AB, Canada, 2018-06-18.

Enabling Scientific Discovery through Interactive Visual Data Analysis

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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.
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Enabling Scientific Discovery through Interactive Visual Data Analysis

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University of Utah, Salt Lake City, UT, USA, 2014-12-03.
University of St. Andrews, St. Andrews, Scotland, 2014-11-03.

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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.

For slides, see <http://vdl.sci.utah.edu/team/lex/#talks>.

Paper/Poster Talks

Pathfinder: Visualizing Paths in Graphs (Poster)

BioVis @ ISMB, Orlando, FL, USA, 2016-07-08.

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EuroVis 2012, Vienna, Austria, 2012-06-07.

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

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Video Tip of the Week: Pathfinder, for exploring paths through data sets

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Harvard And DARPA Develop Software For Deconstructing Top 100 Rankings

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Heimische Forscher machen die Dynamik hinter Rankings sichtbar

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Data visualization: ambiguity as a fellow traveler

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Pathway Analysis to Decipher Data

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Celebrating minds dedicated to discovery

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Tip of the Week: Caleydo for gene expression and pathway visualization

For links to the articles, see <http://vdl.sci.utah.edu/team/lex/#press>.

Salt Lake City, UT, November 28, 2018