Michael Correll, PhD.

Research Scientist, Tableau Software

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Research Interests

I am interested in information visualization: how can we visually present data in effective ways? I am particularly interested in the design of visualizations that allow the viewer to build up high-level pictures of the data from low-level details. Careful visualization design can allow even untrained viewers to make complicated statistical inferences about large data sets. However, designers must be mindful of perceptual and cognitive biases in how visualizations are interpreted. I have approached this problem in collaboration with computer scientists and psychologists, in applied domains such as virology, genetics, and literature.

Professional Experience

- Fall 2017-present: Research Scientist, Tableau Research, Tableau Software.
- Fall 2015-Fall 2017: Research Associate, Interactive Data Lab, Department of Computer Science, University of Washington.
- Summer 2010-Summer 2015: Research Assistant, Graphics and Vision Lab, Department of Computer Sciences, Univ. of Wisc. – Madison.
- Summer 2008: Intelligence Aide (Computer Science), Office of Naval Intelligence.

Teaching Experience

- Spring ’16: Instructional Staff, CSE512: Data Visualization, Department of Computer Science and Engineering, Univ. of Washington.
- Spring ’12: Teaching Assistant, COSC838/638: Visualization, Department of Computer Sciences, Univ. of Wisc. – Madison.
- Spring ’10: Teaching Assistant, COSC838: Visualization and COSC679: Computer Game Technology, Department of Computer Sciences, Univ. of Wisc. – Madison.
- Summer ’09: Teaching Assistant, REAS: Mathematical Logic, Johns Hopkins Center for Talented Youth, Lancaster site.
- Fall ’09: Teaching Assistant, MATH221: Calculus and Analytic Geometry, Department of Mathematics, Univ. of Wisc. – Madison.
- Fall ’08: Teaching Assistant, PHIL215: Critical Thinking. Department of Philosophy, St. Mary’s College of Maryland.
- Summer ’06, Summer ’07: Teaching Assistant, IROB: Introduction to Robotics, Johns Hopkins Center for Talented Youth, Palo Alto site.

Education

- Fall 2009-Fall 2015: Graduate Student, Department of Computer Sciences, Univ. of Wisc. – Madison.
  - Awarded Ph.D., August 2015.
  - Thesis: “Improving Visual Statistics”
  - Awarded M.S. (3.7/4.0 GPA), May 2011.
  - Research area: Information Visualization.
  - Advisor: Michael Gleicher.
- Fall 2005-Spring 2009: St. Mary’s College of Maryland
  - Awarded B.A., summa cum laude (3.9/4.0 GPA), May 2012.
  - Majors: Philosophy, Computer Science. Minor in Mathematics.
  - St. Mary’s Senior Project: “Can Machines Think: A Philosophical Guide.”
- Fall 2001-Spring 2005: Richard Montgomery High School
  - International Baccalaureate Diploma (3.5/4.0 GPA).

Publications

Refereed Full Conference Papers

- Andrew McNutt, Gordon Kindlmann, **Michael Correll**. Surfacing Visualization Mirages. *Proceedings of ACM CHI 2020*. (CHI 2020, to appear)
- **Michael Correll**, Enrico Bertini, Steven Franconeri. Truncating the Y-Axis: Threat or Menace? *Proceedings of ACM CHI 2020*. (CHI 2020, to appear)
- **Michael Correll**. Ethical Implications of Visualization Research. *Proceedings of ACM CHI 2019*. (CHI 2019)
- **Michael Correll**, Dominik Moritz, and Jeffrey Heer. Value-Suppressing Uncertainty Palettes. *Proceedings of ACM CHI 2018*. (CHI 2018)
- **Michael Correll** and Jeffrey Heer. Regression by Eye: Estimating Trends in Bivariate Visualizations. *Proceedings of ACM CHI 2017*. (CHI 2017)
- **Michael Correll** and Michael Gleicher. The Semantics of Sketch: A Visual Query System for Time Series Data. *Proceedings of IEEE VAST 2016*. (VAST 2016)
- Danielle Albers, **Michael Correll**, and Michael Gleicher. Task-Driven Evaluation of Aggregation in Time Series Visualization. *Proceedings of ACM CHI 2014*. (CHI 2014)
- **Michael Correll**, Eric Alexander, and Michael Gleicher. Quantity Estimation in Visualizations of Tagged Text. *Proceedings of ACM CHI* 2013. (CHI 2013)
- **Michael Correll**, Danielle Albers, Steven Franconeri, and Michael Gleicher. Comparing Averages in Time Series Data. *Proceedings of ACM CHI* 2012. (CHI 2012)

- **Michael Correll**, Subhadip Ghosh, David O'Connor, and Michael Gleicher. Visualizing Virus Population Variability from Next Generation Sequencing Data. *IEEE Symposium on Biological Data Visualization (BioVis)*, 2011. (BioVis 2011)

Journal Articles

- Yunhai Wang, Zeyu Wang, Tingting Liu, **Michael Correll**, Zhanglin Cheng, Oliver Deussen, Michael Sedlmair. Improving the Robustness of Scagnostics. *IEEE Transactions on Visualization and Computer Graphics.* (InfoVis 2019)
- Younghoon Kim, **Michael Correll**, Jeffrey Heer. Designing Animated Transitions to Convey Aggregate Operations. *Computer Graphics Forum*. (EuroVis 2019)
- **Michael Correll**, Mingwei Li, Gordon Kindlmann, and Carlos Scheidegger. Looks Good To Me: Visualizations As Sanity Checks. *IEEE Transactions on Visualization and Computer Graphics.* (InfoVis 2018)
- Jessica Hullman, Xiaoli Qiao, **Michael Correll**, Alex Kale, and Matthew Kay. In Pursuit of Error: A Survey of Uncertainty Visualization Evaluation. *IEEE Transactions on Visualization and Computer Graphics.* (InfoVis 2018)
- Alper Sarikaya, **Michael Correll**, Lyn Bartram, Melanie Tory, and Danyel Fisher. What Do We Talk About When We Talk About Dashboards? *IEEE Transactions on Visualization and Computer Graphics.* (InfoVis 2018)
- **Michael Correll** and Jeffrey Heer. Surprise! Bayesian Weighting for De-Biasing Thematic Maps. *IEEE Transactions on Visualization and Computer Graphics*. (InfoVis 2016)
- Alper Sarikaya, **Michael Correll**, Jorge Dinis, David O'Connor, and Michael Gleicher. Visualizing Co-occurrence of Events in Populations of Viral Genome Sequences. *Computer Graphics Forum* Vol. 35 No. 3., 2016. (EuroVis 2016)
- **Michael Correll,** Adam L. Bailey, Alper Sarikaya, David H. O'Connor, and Michael Gleicher. LayerCake: a tool for the visual comparison of viral deep sequencing data. *Bioinformatics*, 2015.
- **Michael Correll** and Michael Gleicher. Error Bars Considered Harmful: Exploring Alternate Encodings for Mean and Error. *IEEE Transactions on Visualization and Computer Graphics*. (InfoVis 2014)
- Adam Bailey, Michael Lauck, Samuel Sibley, Jerilyn Pecotte, Geoffrey Weny, Alex Tumukunde, David Hyeroba, Justin Greene, **Michael Correll**, Michael Gleicher, Thomas Friedrich, Peter Jahrling, Jens Kuhn, Tony Goldberg, Jeffrey Rogers, and David O'Connor. Two Novel Simian Ateriviruses in Captive and Wild Baboons (Papio spp.). *Journal of Virology*, Vol. 88 No. 22, 2014.
- Adam Bailey, Michael Lauck, Andrea Weiler, Samuel Sibley, Jorge Dinis, Zachary Bergman, Chase Nelson, **Michael Correll**, Michael Gleicher, David Hyeroba, Alex Tumukunde, Geoffrey Weny, Colin Chapman, Jen Kuhns, Austin Hughes, Thomas Friedrich, Tony Goldberg, and David O'Connor. High Genetic Diversity and Adaptive Potential of Two Simian Hemorrhagic Fever Viruses in a Wild Primate Population. *PLoS One*, Vol. 9 No. 3, 2014.

- Michael Gleicher, **Michael Correll**, Christine Nothelfer, and Steven Franconeri. Perception of Average Value in Multiclass Scatterplots. *IEEE Transactions on Visualization and Computer Graphics,* Vol. 19 No. 12, 2013. (InfoVis 2013)
- Shelby O'Connor, Erica Becker, Jason Weinfurter, Emily Chin, Melisa Budde, Emma Gostick, **Michael Correll**, Michael Gleicher, Austin Hughes, David Price, Thomas Friedrich, and David O'Connor. Conditional CD8+ T Cell Escape During Acute Simian Immunodeficiency Virus Infection. *Journal of Virology* Vol. 86 No. 1, 2012.
- **Michael Correll**, Michael Witmore, and Michael Gleicher. Exploring Collections of Tagged Text for Literary Scholarship. *Computer Graphics Forum* Vol. 30 No. 3, 2011. (EuroVis 2011)

Thesis

- **Michael Correll**. Improving Visual Statistics. Committee: Michael Gleicher (Advisor), Steven Franconeri, Charles Franklin, Bilge Mutlu, Kevin Ponto, and Robert Roth. University of Wisconsin-Madison, 2015.

Workshop Papers

- Xiaoying Pu, Matthew Kay, **Michael Correll**, Eli Brown. Unbiasing Visual Data Exploration in the Garden of Forking Paths. *CHI 2019 Workshop on Human-Centered Study of Data Science Work Practices*, 2017.
- **Michael Correll** and Jeffrey Heer. Black Hat Visualization. *DECISIVe: Workshop on Dealing with Cognitive Biases in Visualisations*, 2017.
- **Michael Correll** and Michael Gleicher. Implicit Uncertainty Information: Aligning Perception and Statistics. *Visualization for decision making under certainty*, 2015.
- **Michael Correll** and Michael Gleicher. Bad for Data, Good for the Brain: Knowledge-First Axioms for Visualization Design. *DECISIVe: Workshop on Dealing with Cognitive Biases in Visualisations*, 2014.
- **Michael Correll**, Eric Alexander, Danielle Albers, Alper Sarikaya, and Michael Gleicher. Navigating Reductionism and Holism in Evaluation. *BELIV '14: Proceedings of the 2014 BELIV Workshop: Beyond Time and Errors – Novel Evaluation Methods for Visualization*, 2014.
- **Michael Correll** and Michael Gleicher. What Shakespeare Taught Us About Text Visualization. *2nd Workshop on Interactive Visual Text Analytics, IEEE Information Visualization Conference Workshop Proceedings,* 2012.

Refereed Abstracts

- Andrew McNutt, Anamaria Crisan, **Michael Correll**. Divining Insights: Visual Analytics Through Cartomancy. *Extended Abstracts of the 2020 CHI Conference on Human Factors in Computing Systems*, 2020. (alt.CHI, to appear)
- **Michael Correll**. Ross-Chernoff Glyphs Or: How Do We Kill Bad Ideas in Visualization? *Extended Abstracts of the 2018 CHI Conference on Human Factors in Computing Systems*, 2018. (alt.CHI)
- Danielle Albers, **Michael Correll**, Michael Gleicher, and Steve Franconeri. Ensemble Processing of Color and Shape: Beyond Mean Judgments. *Journal of Vision* Vol. 14 No. 11, 2014.
- **Michael Correll** and Michael Gleicher. Error Bars Considered Harmful. *IEEE Information Visualization Conference Poster Proceedings*, 2013.
- **Michael Correll** and Michael Gleicher. Poster: Understanding Tagged Text. *IEEE Information Visualization Conference Poster Proceedings*, 2010.

Invited Talks

- "Lies, Distortions, and Misrepresentations in Visualization" *Tableau Conference,* 2019.
- "Counting, Collaborating, and Coexisting: Visualization in the Digital Humanities" 4th *Workshop on Visualization for the Digital Humanities*, 2019.
- "Black Hat Visualization," *HCI Seminar,* University of Maryland, 2019.
- "Towards A General Theory of Visualization Weirdness" *Statistical Inference, Learning and Models in Data Science*. Fields Institute, 2018.
- "Why Visual Analytics Needs the Liberal Arts" *2018 Top 10 Business Intelligence Trends*, 2018.
- "Surprise! A Bayesian Technique for De-Biasing Thematic Maps" *Tableau Conference*, 2017.
- "Bias and Uncertainty in Information Visualization" *DUB Seminar*, University of Washington, 2017.

Awards

- IEEE VIS Doctoral Colloquium Fellowship (2013)
- Univ. of Wisc. - Madison Dept. of Comp. Sci. Summer Graduate Fellowship (2010)
- St. Mary's Senior Scholar (2009)
- St. Mary's College of Maryland Deans List (2005-2009)

Academic Service

- Publicity Co-Chair, Organizing Committee, *IEEE VIS* (2020).
- Organizing Committee, *Visualization for Social Good* (2019).
- Organizing Committee, *Designing for Uncertainty in HCI: When Does Uncertainty Help?* (2017).

- Organizing Committee, *Workshop on Visualization for the Digital Humanities* (2016, 2017).
- Program Committee, *IEEE VIS* InfoVis (2018-2020).
- Program Committee, *BELIV* (2016, 2018).
- Program Committee, *Workshop on Visualization for the Digital Humanities* (2018).
- Program Committee, *Leipzig Symposium on Visualization in Applications* (2018,2019).
- Program Committee, *EuroVA* (2014,2016-2018).
- Program Committee, *DECISIVe* (2017).
- Panelist, National Science Foundation (2018,2019).
- Reviewer, National Science Foundation (2020).
- Reviewer, *EuroVis* (2014-2020).
- Reviewer, ACM *CHI* (2015-2020).
- Reviewer, IEEE *VIS/VisWeek* (2012-2019).
- Reviewer, *Graphics Interface* (2019).
- Reviewer, *Computer Graphics and Applications* (2019).
- Reviewer, IEEE *TVCG* (2014-2019).
- Reviewer, *Information Visualization* (2016-2019).
- Reviewer, *Computers & Graphics* (2018).
- Reviewer, *The Visual Computer* (2017).
- Reviewer, *Education Assessment* (2015).
- Reviewer, *PNAS* (2014).

Memberships

- ΦBK Honor Society
- Association for Computing Machinery (ACM)