Annotated Bibliography
Information Visualization
(CSCI 628)

Ashiqur Rahman
Z-ID: **Z1874484**

30 September 2021

Instructor

Dr. David Koop
Assistant Professor
Department of Computer Science
Northern Illinois University

---

1. Bibliography

1.1. survey on visualization for scientific literature topics [31]

The authors surveyed several scientific literatures and curated some interesting visualizations. Besides the term-topic matrix, and topic panorama the “themestream”, and “time line” visualizations seems promising and can be repurposed for our project.

1.2. Sizing the horizon: the effects of chart size and layering on the graphical perception of time series visualizations [14]

The authors present methods to visualize time series data using a horizon graph that enables us to present more data in smaller spaces. This can be useful to visualize the whole dataset for our project in a single visualization.

1.3. Visjockey: Enriching data stories through orchestrated interactive visualization [21]

The authors propose a method to connect text description to visualization through animation. This can be helpful for the user to understand the core idea the visualization is trying to convey. Can be useful for our project to show the connections between topics, stance, and time.

1.4. Using visualization to understand big data [20]

The authors present different visualization techniques to show large data sets which are useful to convey a message without focusing too much on the fine-grain details. The use of radar charts and calendar heatmaps is very interesting and can be useful for our purpose to represent topic and stance change over time.

1.5. Visualization for communication: the importance of aesthetic sizzle [2]

The author discusses the use of aesthetic details in a visualization which can be an important part of getting the user's attention. But this can also be a negative if used without care. An important point for our project is where we want to convey the message to the user about misinformation and the change in the user's opinion.

1.6. TopicPanorama: A Full Picture of Relevant Topics [29]

The proposed method - TopicPanaroma by the authors visualize topics covered in different sources. The visualization technique is very interesting and can be repurposed for our project to possibly show the impact of topics on different users.

1.7. Termite: visualization techniques for assessing textual topic models [6]

The authors propose a topic comparison method called Termite that visually represents topics in a tabular format. The visualization is promising to compare and evaluate topics from textual data.

1.8. Self-Service Technology Research: A bibliometric co-citation visualization analysis [26]

The authors analyze the self-service technology (SST) research and its evolution. The cluster visualization they used to represent the SST research areas is very interesting and can be improvised to report the topic relationship in our project.

1.9. The state of the art in multilayer network visualization [23]

The paper provides an analysis of multi-layer network visualization techniques. The hive plot representation and edge bundling displayed on the paper are very promising to display the topic relationship in our project.

1.10. Network visualization with ggplot2 [28]

This paper explores different ways to visualize network data using the ggplot2 library. The use of color mapping in clusters of networks as shown in the paper is an effective way to convey the topic and stance relation for our project.

1.11. Visual Analytics for Temporal Hypergraph Model Exploration [10]

The authors propose HyperMatrix - an interactive approach to visualizing multi-level hypergraph models. The method to zoom in to view the connections and the actual data is very interesting. This approach is promising to represent the topic relationship and data behind the topic in our project.

1.12. ConfusionFlow: A model-agnostic visualization for temporal analysis of classifier confusion [15]

The authors propose ConfusionFlow - a visualization to compare the performance of different machine learning models. The use of multiple views and the heatmap seems very promising to convey information to the user. We can use this to visualize the relation of the topic with stance and then compare different topics.

1.13. The Next Billion Users of Visualization [18]

The author discusses the disproportionate focus in visualization research towards the developed world while the future users of visualization are going to be from the emerging economies. The visualization the author used using glyphs of Australian maps

for comparison is interesting to represent the proportionate size of a topic in our project.

1.14. Temporal Pyramid Network with Spatial-Temporal Attention for Pedestrian Trajectory Prediction [22]

The authors in the paper propose a framework to represent pedestrian trajectory information. The heatmap representation of parallel walk is an interesting visualization that we can repurpose to represent the topic and stance relationship.

1.15. Timelines Revisited: A Design Space and Considerations for Expressive Storytelling [3]

The authors of this paper represent different ways to represent temporal data in a storytelling approach. The radial representation of temporal events is promising for implementation in our project.

1.16. TargetVue: Visual Analysis of Anomalous User Behaviors in Online Communication Systems [4]

The authors represent a tool called TargetVue to analyze the behavior of anomalous users on social media. The network and glyph visualization presented on the paper is very interesting and can be useful to represent the topic to stance relation for our project.

1.17. Survey on Visual Analysis of Event Sequence Data [13]

The authors propose a visual analysis of event sequence data represented on different visualization. Some of the visualizations presented in the article especially the TargetVue in Figure 9 can be useful for our project.

1.18. When (ish) is My Bus? User-centered Visualizations of Uncertainty in Everyday, Mobile Predictive Systems [19]

The authors present a novel approach for visualizing the uncertainty of public transit. The proposed approach of “stripeplot” is very interesting and can be used to visualize the density of topics on a timeline.

1.19. Linguistic Approach to Categorical Color Assignment for Data Visualization [25]

The authors propose an algorithm to suggest appropriate color assignments for categorical data. The concept can be useful to visualize the topics in our project. Also, the visualization used in Figure 6 of the paper can be an effective way to represent the topics combined with the words in the topic and relative scores.

1.20. Augmenting Visualizations with Interactive Data Facts to Facilitate Interpretation and Communication [27]

Authors present a method called Voder that suggests multiple visualization options for any data. This could be useful to find different ways to visualize our topic relation.

1.21. Visualizing Social Media Content with SentenTree [16]

SentenTree proposed by the authors of the paper is a unique way to represent social media text and topic relation outside of the word cloud. Can be useful to represent the stance relation with topics in our project.

1.22. TimeLineCurator: Interactive Authoring of Visual Timelines from Unstructured Text [11]

The authors propose a browser-based tool called TimeLineCurator to generate timelines from unstructured text using NLP. The visualization examples generated from the tools

are very interesting and can be a good option to represent topics over time in our project.

1.23. Comparing and Exploring High-Dimensional Data with Dimensionality Reduction Algorithms and Matrix Visualizations [8]

Authors propose methods of representing and comparing high-dimensional data. The scatterplot visualization used in the paper is useful to compare multiple datasets.

1.24. IEEE VIS 2016 and 2017 arts program gallery [12]

The article curates interesting visualizations from the digital and physical worlds. Some of the visualizations like "Treepedia", and "VIJKS" provide a new perspective of representing multidimensional data.

1.25. FI3D: direct-touch interaction for the exploration of 3D scientific visualization spaces [30]

The authors propose a method of touch-based exploration for 3D data. Although, not very useful for our current project, it is an interesting method to represent multidimensional data for the user to explore.

1.26. Balancing systematic and flexible exploration of social networks [24]

Authors propose visualization to explore the relations in the social networks. Can be useful in representing the relation between topic nodes in our project.

1.27. Separating the Wheat from the Chaff: Comparative Visual Cues for Transparent Diagnostics of Competing Models [9]

The authors have proposed a method to compare multiple models and their performance. The visualizations they used for comparison using multiple views are very interesting and promising for the purpose of showing the connection between different datasets.

1.28. Interactive tree comparison for co-located collaborative information visualization [17]

The authors proposed a multi-touch collaborative technique for table-top display for visualization comparison. There are some interesting visualization concepts for cladograms with labeling on the edges.

1.29. VIS30K: A Collection of Figures and Tables From IEEE Visualization Conference Publications [5]

The authors curated 29,689 images that contain figures from all domains of IEEE visualization conferences between 1990 and 2019. While the visualizations used in this paper are straightforward, the comprehensive list is handy to figure out what has been done so far. Website: https://visimagenavigator.github.io

1.30. Time Curves: Folding Time to Visualize Patterns of Temporal Evolution in Data [1]

The authors present an interesting method to represent temporal data. If we forego the thinking that time is a linear thing, many interesting patterns can immerge.

1.31. The Longest Month: Analyzing COVID-19 Vaccination Opinions Dynamics From Tweets in the Month Following the First Vaccine Announcement [7]

The authors propose the machine learning model to detect stance from Twitter data which is also a key part of our project. They also provide a labeled dataset that can be used as the ground truth data for the stance detection part of our project. The authors chose the basic line and bar charts to show the stance over time - which is not very interesting but does the job efficiently.

References

[1] Benjamin Bach, Conglei Shi, Nicolas Heulot, Tara Madhyastha, Tom Grabowski, and Pierre Dragicevic. 2016. Time Curves: Folding Time to Visualize Patterns of Temporal Evolution in Data. *IEEE Trans. Vis. Comput. Graph.* 22, 1 (January 2016), 559–568. DOI:https://doi.org/10.1109/TVCG.2015.2467851

[2] R. Brath, M. Peters, and R. Senior. 2005. Visualization for communication: the importance of aesthetic sizzle. In *Ninth International Conference on Information Visualisation (IV'05)*, 724–729. DOI:https://doi.org/10.1109/IV.2005.145

[3] Matthew Brehmer, Bongshin Lee, Benjamin Bach, Nathalie Henry Riche, and Tamara Munzner. 2017. Timelines Revisited: A Design Space and Considerations for Expressive Storytelling. *IEEE Trans. Vis. Comput. Graph.* 23, 9 (September 2017), 2151–2164. DOI:https://doi.org/10.1109/TVCG.2016.2614803

[4] Nan Cao, Conglei Shi, Sabrina Lin, Jie Lu, Yu-Ru Lin, and Ching-Yung Lin. 2016. TargetVue: Visual Analysis of Anomalous User Behaviors in Online Communication Systems. *IEEE Trans. Vis. Comput. Graph.* 22, 1 (January 2016), 280–289. DOI:https://doi.org/10.1109/TVCG.2015.2467196

[5] Jian Chen, Meng Ling, Rui Li, Petra Isenberg, Tobias Isenberg, Michael Sedlmair, Torsten Moller, Robert S. Laramee, Han-Wei Shen, Katharina Wunsche, and Qiru Wang. 2021. VIS30K: A Collection of Figures and Tables From IEEE Visualization Conference Publications. *IEEE Trans. Vis. Comput. Graph.* 27, 9 (September 2021), 3826–3833. DOI:https://doi.org/10.1109/TVCG.2021.3054916

[6] Jason Chuang, Christopher D. Manning, and Jeffrey Heer. 2012. Termite: visualization techniques for assessing textual topic models. In *Proceedings of the International Working Conference on Advanced Visual Interfaces* (AVI '12), Association for Computing Machinery, New York, NY, USA, 74–77. DOI:https://doi.org/10.1145/2254556.2254572

[7] Liviu-Adrian Cotfas, Camelia Delcea, Ioan Roxin, Corina Ioanăş, Dana Simona Gherai, and Federico Tajariol. 2021. The Longest Month: Analyzing COVID-19 Vaccination Opinions Dynamics From Tweets in the Month Following the First Vaccine Announcement. *IEEE Access* 9, (2021), 33203–33223. DOI:https://doi.org/10.1109/ACCESS.2021.3059821

[8] Rene Cutura, Michaël Aupetit, Jean-Daniel Fekete, and Michael Sedlmair. 2020. Comparing and Exploring High-Dimensional Data with Dimensionality Reduction Algorithms and Matrix Visualizations. In *Proceedings of the International Conference on Advanced Visual Interfaces* (AVI '20), Association for Computing Machinery, New York, NY, USA, 1–9. DOI:https://doi.org/10.1145/3399715.3399875

[9] Aritra Dasgupta, Hong Wang, Nancy O'Brien, and Susannah Burrows. 2020. Separating the Wheat from the Chaff: Comparative Visual Cues for Transparent Diagnostics of Competing Models. *IEEE Trans. Vis. Comput. Graph.* 26, 1 (January 2020), 1043–1053. DOI:https://doi.org/10.1109/TVCG.2019.2934540

[10] Maximilian T. Fischer, Devanshu Arya, Dirk Streeb, Daniel Seebacher, Daniel A. Keim, and Marcel Worring. 2021. Visual Analytics for Temporal Hypergraph Model Exploration. *IEEE Trans. Vis. Comput. Graph.* 27, 2 (February 2021), 550–560.

DOI:https://doi.org/10.1109/TVCG.2020.3030408

[11] Johanna Fulda, Matthew Brehmel, and Tamara Munzner. 2016. TimeLineCurator: Interactive Authoring of Visual Timelines from Unstructured Text. *IEEE Trans. Vis. Comput. Graph.* 22, 1 (January 2016), 300–309. DOI:https://doi.org/10.1109/TVCG.2015.2467531

[12] Benedikt Groß, Raphael Reimann, Philipp Schmitt, Esteban Garcia Bravo, Maxwell Carlson, Aaron Zernack, Jorge Garcia, Yoon Chung Han, Shankar Tiwari, Till Nagel, Christopher Pietsch, Mark J. Stock, Weili Shi, Jessica Parris Westbrook, Adam Trowbridge, Mike Richison, Mitch Goodwin, Clement Fay, Sebastian Lay, Jo Vermeulen, Charles Perin, Eric Donovan, Raimund Dachselt, Sheelagh Carpendale, Paul Heinicker, Dietmar Offenhuber, Duncan Clark, Robin Houston, Tristan Smith, Adriene Jenik, Clarissa Ribeiro, Mick Lorusso, Herbert Rocha, Wonyoung So, Mauro Martino, Hendrik Strobelt, Owen Cornec, Scottie Chih-Chieh Huang, Yu-Chun Huang, Inhye Lee, Hyomin Kim, Pierre Amelot, John Hwong, Kate McManus, Ryan McGee, and Mary Bates Neubauer. 2020. IEEE VIS 2016 and 2017 arts program gallery. *Leonardo* 53, 1 (February 2020), 6–24. DOI:https://doi.org/10.1162/leon_a_01837

[13] Yi Guo, Shunan Guo, Zhuochen Jin, Smiti Kaul, David Gotz, and Nan Cao. 2020. Survey on Visual Analysis of Event Sequence Data. *arXiv [cs.HC]*. Retrieved from http://arxiv.org/abs/2006.14291

[14] Jeffrey Heer, Nicholas Kong, and Maneesh Agrawala. 2009. Sizing the horizon: the effects of chart size and layering on the graphical perception of time series visualizations. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (CHI '09), Association for Computing Machinery, New York, NY, USA, 1303–1312. DOI:https://doi.org/10.1145/1518701.1518897

[15] Andreas Hinterreiter, Peter Ruch, Holger Stitz, Martin Ennemoser, Jurgen Bernard,

Hendrik Strobelt, and Marc Streit. 2020. ConfusionFlow: A model-agnostic visualization for temporal analysis of classifier confusion. *IEEE Trans. Vis. Comput. Graph.* PP, (July 2020). DOI:https://doi.org/10.1109/TVCG.2020.3012063

[16] Mengdie Hu, Krist Wongsuphasawat, and John Stasko. 2017. Visualizing Social Media Content with SentenTree. *IEEE Trans. Vis. Comput. Graph.* 23, 1 (January 2017), 621–630. DOI:https://doi.org/10.1109/TVCG.2016.2598590

[17] Petra Isenberg and Sheelagh Carpendale. 2007. Interactive tree comparison for co-located collaborative information visualization. *IEEE Trans. Vis. Comput. Graph.* 13, 6 (November 2007), 1232–1239. DOI:https://doi.org/10.1109/TVCG.2007.70568

[18] Amit Jena, Matthew Butler, Tim Dwyer, Kirsten Ellis, Ulrich Engelke, Reuben Kirkham, Kim Marriott, Cecile Paris, Venkatesh Rajamanickam, and Theresa-Marie Rhyne. 2021. The Next Billion Users of Visualization. *IEEE Comput. Graph. Appl.* 41, 2 (March 2021), 8–16. DOI:https://doi.org/10.1109/MCG.2020.3044071

[19] Matthew Kay, Tara Kola, Jessica R. Hullman, and Sean A. Munson. 2016. When (ish) is My Bus? User-centered Visualizations of Uncertainty in Everyday, Mobile Predictive Systems. In *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems* (CHI '16), Association for Computing Machinery, New York, NY, USA, 5092–5103. DOI:https://doi.org/10.1145/2858036.2858558

[20]T. A. Keahey. 2013. Using visualization to understand big data. *IBM Business Analytics Advanced Visualisation* (2013). Retrieved from https://dataconomy.com/wp-content/uploads/2014/06/IBM-WP_Using-vis-to-understand-big-data.pdf

[21] B. C. Kwon, F. Stoffel, D. Jäckle, and B. Lee. 2014. Visjockey: Enriching data stories through orchestrated interactive visualization. *Poster compendium of the* (2014). Retrieved from https://www.bckwon.com/pdf/visjockey.pdf

[22] Yuanman Li, Rongqin Liang, Wei Wei, Wei Wang, Jiantao Zhou, and Xia Li. 2021. Temporal Pyramid Network with Spatial-Temporal Attention for Pedestrian Trajectory Prediction. *IEEE Transactions on Network Science and Engineering* (2021), 1–1. DOI:https://doi.org/10.1109/TNSE.2021.3065019

[23] F. McGee, M. Ghoniem, G. Melançon, B. Otjacques, and B. Pinaud. 2019. The state of the art in multilayer network visualization. *Comput. Graph. Forum* 38, 6 (September 2019), 125–149. DOI:https://doi.org/10.1111/cgf.13610

[24] Adam Perer and Ben Shneiderman. 2006. Balancing systematic and flexible exploration of social networks. *IEEE Trans. Vis. Comput. Graph.* 12, 5 (September 2006), 693–700. DOI:https://doi.org/10.1109/TVCG.2006.122

[25] Vidya Setlur and Maureen C. Stone. 2016. A Linguistic Approach to Categorical Color Assignment for Data Visualization. *IEEE Trans. Vis. Comput. Graph.* 22, 1 (January 2016), 698–707. DOI:https://doi.org/10.1109/TVCG.2015.2467471

[26] Hakseung Shin and Richard R. Perdue. 2019. Self-Service Technology Research: A bibliometric co-citation visualization analysis. *Int. J. Hosp. Manage.* 80, (July 2019), 101–112. DOI:https://doi.org/10.1016/j.ijhm.2019.01.012

[27] Arjun Srinivasan, Steven M. Drucker, Alex Endert, and John Stasko. 2018. Augmenting Visualizations with Interactive Data Facts to Facilitate Interpretation and Communication. *IEEE Trans. Vis. Comput. Graph.* (August 2018). DOI:https://doi.org/10.1109/TVCG.2018.2865145

[28] Sam Tyner, François Briatte, and Heike Hofmann. 2017. Network visualization with ggplot2. *R J.* 9, 1 (2017), 27. DOI:https://doi.org/10.32614/rj-2017-023

[29] Xiting Wang, Shixia Liu, Junlin Liu, Jianfei Chen, Jun Zhu, and Baining Guo. 2016. TopicPanorama: A Full Picture of Relevant Topics. *IEEE Trans. Vis. Comput. Graph.* 22, 12 (December 2016), 2508–2521. DOI:https://doi.org/10.1109/TVCG.2016.2515592

[30] Lingyun Yu, Pjotr Svetachov, Petra Isenberg, Maarten H. Everts, and Tobias Isenberg. 2010. FI3D: direct-touch interaction for the exploration of 3D scientific visualization spaces. *IEEE Trans. Vis. Comput. Graph.* 16, 6 (November 2010), 1613–1622. DOI:https://doi.org/10.1109/TVCG.2010.157

[31] Changhong Zhang, Zeyu Li, and Jiawan Zhang. 2018. A survey on visualization for scientific literature topics. *Journal of Visualization* 21, 2 (April 2018), 321–335. DOI:https://doi.org/10.1007/s12650-017-0462-2