

CSE512 Final Project Progress Report

Ian Wesley-Smith, Lovenoor Aulck, Yea-Seul Kim

Literature Review. A background survey of related work and a full list of references.

- [1] S. Ainsworth and A. T. Loizou. The effects of self-explaining when learning with text or diagrams. *Cognitive Science*, 27(4):669–681, 2003.
- [2] M. T. Chi. Self-explaining expository texts: The dual processes of generating inferences and repairing mental models. *Advances in instructional psychology*, 5:161–238, 2000.
- [3] M. T. Chi and M. Bassok. Learning from examples via self-explanations. *Knowing, learning, and instruction: Essays in honor of Robert Glaser*, pages 251–282, 1989.
- [4] M. T. Chi, N. Leeuw, M.-H. Chiu, and C. LaVancher. Eliciting self-explanations improves understanding. *Cognitive science*, 18(3):439–477, 1994.
- [5] L. Cosmides and J. Tooby. Are humans good intuitive statisticians after all? rethinking some conclusions from the literature on judgment under uncertainty. *cognition*, 58(1):1–73, 1996.
- [6] G. O. Einstein, H. G. Mullet, and T. L. Harrison. The testing effect: Illustrating a fundamental concept and changing study strategies. *Teaching of Psychology*, 39(3):190–193, 2012.
- [7] A. Gelman. Exploratory data analysis for complex models. *Journal of Computational and Graphical Statistics*, 13(4), 2004.
- [8] D. Gentner and V. Gunn. Structural alignment facilitates the noticing of differences. *Memory & Cognition*, 29(4):565–577, 2001.
- [9] J. D. Gobert and J. J. Clement. Effects of student-generated diagrams versus student-generated summaries on conceptual understanding of causal and dynamic knowledge in plate tectonics. *Journal of research in science teaching*, 36(1):39–53, 1999.
- [10] Heer and B. Shneiderman. Interactive dynamics for visual analysis. *Queue*, 10(2):30, 2012.
- [11] M. Hegarty. Mental animation: inferring motion from static displays of mechanical systems. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 18(5):1084, 1992.
- [12] M. Hegarty. Diagrams in the mind and in the world: Relations between internal and external visualizations. In *Diagrammatic representation and inference*, pages 1–13. Springer, 2004.
- [13] M. Hegarty, S. Kriz, and C. Cate. The roles of mental animations and external animations in understanding mechanical systems. *Cognition and instruction*, 21(4):209–249, 2003.

- [14] J. Hullman, E. Adar, and P. Shah. Benefitting infovis with visual difficulties. *Visualization and Computer Graphics, IEEE Transactions on*, 17(12):2213–2222, 2011.
- [15] S. L. Jarvenpaa. Graphic displays in decision making the visual salience effect. *Journal of Behavioral Decision Making*, 3(4):247–262, 1990.
- [16] C. A. Kaplan and H. A. Simon. In search of insight. *Cognitive psychology*, 22(3):374–419, 1990.
- [17] J. Keenan and S. D. Baillet. Memory for personally and socially significant events. *Attention and performance*, 8:651–669, 1980.
- [18] M. W. Kreuter, D. W. Farrell, L. R. Olevitch, and L. K. Brennan. *Tailoring health messages: Customizing communication with computer technology*. Routledge, 2013.
- [19] Z. Liu and J. T. Stasko. Mental models, visual reasoning and interaction in information visualization: A top-down perspective. *Visualization and Computer Graphics, IEEE Transactions on*, 16(6):999–1008, 2010.
- [20] H. M. Natter and D. C. Berry. Effects of active information processing on the understanding of risk information. *Applied Cognitive Psychology*, 19(1):123–135, 2005.
- [21] A. Ottley, E. Peck, L. Harrison, D. Afergan, C. Ziemkiewicz, H. Taylor, P. Han, and R. Chang. Improving bayesian reasoning: The effects of phrasing, visualization, and spatial ability. *Visualization and Computer Graphics, IEEE Transactions on*, 2015.
- [22] C. S. Skinner, V. J. Strecher, and H. Hospers. Physicians’ recommendations for mammography: do tailored messages make a difference? *American Journal of Public Health*, 84(1):43–49, 1994.
- [23] J. G. Trafton, S. B. Trickett, and F. E. Mintz. Connecting internal and external representations: Spatial transformations of scientific visualizations. *Foundations of Science*, 10(1):89–106, 2005.
- [24] H. Wickham, D. Cook, H. Hofmann, and A. Buja. Graphical inference for infovis. *Visualization and Computer Graphics, IEEE Transactions on*, 16(6):973–979, 2010.

Project Plan. A list of milestones breaking the project into smaller chunks and a description of what each person in the group will work on.

- Planning of overall project 59 units (x2 = 118 hours, estimate 120 hours available)
- 1 unit is a smaller chunk of work that we defined as equivalent to 2 hours
- Units are in parenthesis
 - Developing Visualization (47)
 - Line Chart (24)
 - Tick snapping (3)
 - Line drawing (2)
 - Drawing adjustment (2)
 - Visualize actual data (2)
 - Visualize aggregated data (2)
 - Feedback visualization (7)
 - Animate Actual data (1)
 - Animate Aggregated data (2)
 - Bar Chart (20)
 - Integrate code (2)
 - Visualize actual data (1)
 - Visualize aggregated data (7)
 - Feedback visualization (7)
 - Animate actual data (1)
 - Animate aggregate data (2)
 - Walkthrough interface (3)
 - Write up (9)
 - Intro (2)
 - Methods (2)
 - Discussion (4)
 - Future Work (1)
 - Poster (3)

Currently, **Ian** is working on the tick snapping, line drawing and drawing adjustment part. **Lavi** is working on visualizing actual data and aggregated data. **Yea-Seul** is working on integrating code and visualizing actual data for the bar chart. Basically, we are dividing work evenly, and we will touch base on it again next Monday to schedule how next to assign tasks.