Methods for describing analytical provenance using visualization techniques

Teacher(s)
Marco Winckler *(http://www.i3s.unice.fr/~winckler/)*

Course Website (optional)
https://classroom.google.com/
Code: *biuuwcc*

Course description (min 150, max 300 words)
Visual analytics is widely known for facilitating human reasoning through interactive tools. It is a suitable approach to support decision-making processes in application domains as diverse as public health, social media, and finance, where professionals are confronted with the analysis of huge datasets, often characterized by multiple attributes or dimensions. Typically, in an exploratory context, the user has no defined goal and is looking for no particular outcome. Though, when finding something interesting, users should be able to retrace their exploratory path to explain how they found the results. Evidence of these exploratory processes has promoted rapid growth in research on analytical provenance, including techniques to capture, visualize, and analyze provenance information. In this course, we will cover the concepts of provenance analysis and how to describe such as concepts using visualization techniques. We will explore how visualization techniques enact provenance analysis by applying a five-steps method: i) meta-data collection for characterizing dataset and overcoming the cases where meta-data might be missing/incomplete/or imprecise; ii) documenting data transformation process; iii) prototyping provenance analysis in visualization techniques; iv) tracking the use of data as part of provenance analysis; and v) lastly, specifying the user intent with data. The students will apply the method in a case study of their choice. As for the visualization techniques, students will have to paper prototype the visualization technique describing provenance analysis.

Course period
November 6th – November 17th

SSD
INF/01

Course References (optional)
[1] E. D. Ragan, A. Endert, J. Sanyal, and J. Chen, "Characterizing provenance in visualization and data analysis: an organizational framework of provenance types and purposes," IEEE transactions on visualization and computer graphics, vol. 22, no. 1, pp. 31–40, 2015.

[2] K. Xu, A. Ottley, C. Walchshofer, M. Streit, R. Chang, and J. Wenskovitch, "Survey on the analysis of user interactions and visualization provenance," Computer Graphics Forum, vol. 39, no. 3, pp. 757–783, 2020.

[3] C. T. Silva, J. Freire, and S. P. Callahan, "Provenance for visualizations: Reproducibility and beyond," Computing in Science & Engineering, vol. 9, no. 5, pp. 82–89, 2007.

[4] T. Jankun-Kelly, K.-L. Ma, and M. Gertz, "A model and framework for visualization exploration," IEEE Transactions on Visualization and Computer Graphics, vol. 13, no. 2, pp. 357–369, 2007.

Credits and Hours

2 credits, one of lectures (8 hours) and one of practice (15 hour), for a total of 23 hours.

Exam Modality

Two alternatives are available to the student to pass this exam (Teacher(s) may choose other modalities):

1) Paper presentation. Students present the content of 2 papers suggested by the teacher. No groups are allowed.
2) Project. Students implement and experimentally validate an algorithm or its variation from a paper suggested by the teacher. Projects can be done in groups of 1-3 students, depending on the algorithm.

Teacher(s) CV

Attach or link a max 3 pages CV for each teacher proposing the course.

Teacher(s) Main Publications (in relation with the topic of the course)

List 10 main publications in the last 15 years for each teacher.

Florent Robert, Hui-Yin Wu, Lucile Sassatelli, Stephen Ramanoël, Auriane Gros, Marco Winckler. An Integrated Framework for Understanding Multimodal Embodied Experiences in Interactive Virtual Reality. Proceedings of the 2023 ACM International Conference on Interactive Media Experiences, IMX 2023, Nantes, France, June 12-15, 2023. ACM 2023. https://doi.org/10.1145/3573381.3596150 (best paper award).

Shiming Shen, Matteo Treleani, Dario Compagno, Marco Winckler. From Stock Shots to Ghost Data: Tracking Audiovisual Archives about the European Union. VIEW Journal of European Television History and Culture, 12(23): 4 – 23 https://viewjournal.eu/articles/10.18146/view.292

Aline Menin, Minh Nhat Do, Carla Dal Sasso Freitas, Olivier Corby, Catherine Faron, Alain Giboin & Marco Winckler (2022) Using Chained Views and Follow-Up Queries to Assist the Visual Exploration of the Web of Big Linked Data, International Journal of Human–Computer Interaction, DOI: 10.1080/10447318.2022.2112529

Maroua Tikat, Aline Menin, Michel Buffa, Marco Winckler. Engineering Annotations to Support Analytical Provenance in Visual Exploration Processes. In Proceedings of the 22nd International Conference on Web Engineering (ICWE 2022) Bari, Italy, July 5-8, 2022. LNCS 13362, Springer 2022, ISBN 978-3-031-09916-8. https://doi.org/10.1007/978-3-031-09917-5

Hui-Yin Wu, Florent Robert, Théo Fafet, Brice Graulier, Barthelemy Passin-Cauneau, Lucile Sassatelli, Marco Winckler. Designing Guided User Tasks in VR Embodied Experiences. PACMHCI (EICS) (2022), Volume 6, Issue EICS June 2022, Article No.: 158, pp 1–24, https://doi.org/10.1145/3532208

Marco Winckler, Philippe Palanque, Jean-Luc Hak, Eric Barboni, Olivier Nicolas, Laurent Goncalves. Engineering Annotations: A Generic Framework For Gluing Design Artefacts in Models of Interactive Systems. PACMHCI (EICS) (2022), Volume 6, Issue June 2022; Article No.: 174. pp 1–36, https://doi.org/10.1145/3535063

Aline Menin, Catherine Faron Zucker, Olivier Corby, Carla Dal Sasso Freitas, Fabien Gandon, Marco Winckler. From Linked Data Querying to Visual Search: Towards a Visualization Pipeline for LOD Exploration. In Proceedings of the 17th International Conference on Web Information Systems and Technologies - WEBIST, ISBN 978-989-758-536-4; ISSN 2184-3252, pages 53-64. DOI: 10.5220/0010654600003058

Aline Menin, Ricardo Cava, Carla Maria Dal Sasso Freitas, Olivier Corby, Marco Winckler. Towards a Visual Approach for Representing Analytical Provenance in Exploration Processes. The 25th International Conference Information Visualisation, 5 - 9, July 2021, University of Technology Sydney, Sydney, Australia. ONLINE: http://www.graphicslink.co.uk/

Rocha Silva, T., Hak, J. L., Winckler, M. An Approach for Multi-Artifact Testing Through an Ontological Perspective for Behavior-Driven Development. Complex Systems Informatics and Modeling Quarterly (CSIMQ), Volume 7: 81-107 (2016). ISSN: 2255-9922 (Online), DOI 10.7250/csimq.2016-7.05

Firmenich, S., Rossi, G., Winckler, M., Palanque, P. An Approach for Supporting Distributed User Interface Orchestration over the Web. In. International Journal of Human-Computer Studies. ISSN 1071-5819. Vol. 72(1): 53-76 (2014). At: http://dx.doi.org/10.1016/j.ijhcs.2013.08.014