Paola **Valdivia**

Postdoctoral researcher
Aviz - INRIA

Overview

I am a researcher in the field of visual analytics, a practice that brings together data analysis, information visualization, HCI methods and software development. My research focus is on network visual analysis, for which I developed analysis methods for large datasets and interactive prototypes using web technologies. I have presented my work at IEEE VIS, Eurovis, and I have publications in IEEE Transactions on Visualization & Computer Graphics, the top visualization journal.

Professionally used technologies

Python	Jupyter	JavaScript	Dart	React	Git
Pandas	NumPy	D3	Mapbox-GL	Redux	C/C++
Scikit-Learn	R	WebGL	Web canvas	Angular	Matlab

Professional experience

- **Postdoctoral Researcher** — France
  INRIA Saclay — Jun 2018 - present
  - Prototype for visualizing dynamic hypergraphs with focus on usability. **Technologies:** Dart, Web canvas and Python.
  - Development of a prototype for analysis of multidimensional projections for large datasets. **Technologies:** JavaScript, WebGl, D3, Python, Flask, Scikit-Learn, Pandas, SciPy.
  - Currently working in the design of a mixed-initiative prototype for dynamic network clustering visualization for large datasets.
- **Researcher Consultant** — Brazil
  Visibilia — Dec 2018 - Jul 2019
  - Prototype for visualizing recommendation of business regions. **Technologies:** JavaScript, React, MapGl, D3 and Python.
- **Visiting PhD Student** — France
  INRIA Saclay — Aug 2016 - Jul 2017
- **Visiting PhD Student** — USA
  New York University — Nov 2015
- **Software Developer** — Peru
  Peru Credit Bank (BCP) — Aug 2010 - Jul 2011

Education

- **University of São Paulo** — Brazil
  Ph.D. Computer Science — *Dec 2013 - May 2018*
  Dissertation title: *Graph signal processing for visual analysis and data exploration.*
  - Network and spatio-temporal data analysis using graph signal processing.
  - **Technologies:** Python, Pandas, Matlab, JavaScript, React, D3, Angular.
  - **Relevant courses:** Machine learning, mathematical tools for data analysis and data clustering.
- **University of São Paulo** — Brazil
  M.Sc. Computer Science — *Aug 2011 - Nov 2013*
  Thesis title: *Normal correction towards smoothing point-based surfaces.*
- **San Pablo Catholic University** — Peru
  B.S. Informatics Engineering (Computer Science) — *2005 - 2010*
  Coursework project: *Fluid simulation using SPH, Computer graphics.*
  - top student in class

Expertise

visual analytics
network visualization
data science
graph signal processing

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Foreign Languages

spanish	*native*
english	*advanced*
portuguese	*intermediate*
french	*basic*

References

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Publications

- **Valdivia, P.**, Buono, P., Plaisant C., Dufournaud N. and Fekete, J.-D. (2020). *Analyzing Dynamic Hypergraphs with Parallel Aggregated Ordered Hypergraph Visualization*. To appear in IEEE Transactions on Visualization and Computer Graphics.
- **Valdivia, P.**, Dias, F., Petronetto, F., Silva, C. T., and Nonato, L. G. (2015). *Wavelet-based visualization of time-varying data on graphs*. In Visual Analytics Science and Technology (VAST), 2015 IEEE Conference.
- Col, A. D., **Valdivia, P.**, Petronetto, F., Dias, F., Silva, C. T., and Nonato, L. G. (2017). *Wavelet-based visual analysis of dynamic networks*. IEEE Transactions on Visualization and Computer Graphics.
- Col, A. D., **Valdivia, P.**, Petronetto, F., Dias, F., Silva, C. T., and Nonato, L. G. (2017). *Wavelet-based visual analysis for data exploration*. Computing in Science Engineering.
- Søren Knudsen, Jan Aerts, Daniel Archambault, Remco Chang, Jean-Daniel Fekete, **Valdivia, P.** et al. (2019) *Unifying the framework of Multi-Layer Network and Visual Analytics. Visual Analytics of Multilayer Networks Across Disciplines*, Dagstuhl Reports.
- Dias, F., Mansour, M. R., **Valdivia, P.**, Cousty, J., and Najman, L. (2017). *Watersheds on Hypergraphs for Data Clustering*. In International Symposium on Mathematical Morphology and Its Applications to Signal and Image Processing. Springer, Cham.
- Ferreira, V., Valejo, A., **Valdivia, P.** and Valverde-Rebaza, J. (2019) *Exploiting Geographical Data to improve Recommender Systems for Business Opportunities in Urban Areas*. To appear in Proceedings of BRACIS 2019.
- Dias, M.D, **Valdivia, P.**, Petronetto, F., Nonato, L. G. (2013). *Graph Spectral Filtering for Network Simplification* . In Graphics, Patterns and Images (SIBGRAPI), 2013 26th SIBGRAPI-Conference. IEEE.
- **Valdivia, P.**, Cedrim, D., Petronetto, F., Paiva, A., and Nonato, L. G. (2013). *Normal Correction towards Smoothing Point-Based Surfaces*. In Graphics, Patterns and Images (SIBGRAPI), 2013 26th SIBGRAPI-Conference. IEEE.

Short papers

- **Valdivia, P.**, Buono, P., Plaisant C., Dufournaud N. and Fekete, J.-D. (2018). *Using Dynamic Hypergraphs to Reveal the Evolution of the Business Network of a 17th Century French Woman Merchant*. VIS 2018-3rd Workshop on Visualization for the Digital Humanities.

Posters

- **Valdivia, P.**, Buono, P., and Fekete, J.-D. (2017). *Hypenet: Visualizing Dynamic Hypergraphs*. In Puig, A. P. and Isenberg, T., editors, EuroVis 2017 - Posters. The Eurographics Association.
- Dimara, E., **Valdivia, P.**, and Kinkeldey, C. (2017). *DcPAIRS: A Pairs Plot Based Decision Support System*. In Puig, A. P. and Isenberg, T., editors, EuroVis 2017 - Posters. The Eurographics Association.

Software prototypes and contributions

- **Paohvis**. Prototype for visualizing dynamic hypergraphs.
  Implemented in Dart using web canvas.
  Available at: http://www.aviz.fr/paohvis/
- **Waviz**. Prototype for analyzing spatio-temporal data based on the graph wavelet transform.
  Implemented in JavaScript using D3.
  Available at: https://paolavaldivia.github.io/waviz/
- **Siion**. Prototype for showing the best potential regions for opening a business in the city of São Paulo.
  Implemented in Javascript using Mapbox
  Available at: http://siion.visibilia.net.br
- **Dynamic Network Explorer**. Prototype for analyzing dynamic networks based on the graph wavelet transform.
  Implemented in JavaScript using the framework AngularJS and D3.
  Available at: https://paolavaldivia.github.io/dynnet_wavelet/
- **Networkcube**. Improvement of the matrix visualization of networks in this system.
  Implemented in Typescript using WebGL and D3.
  Available at: http://networkcube.net/