Carolina Nobre

Data Visualization Researcher

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Education

Harvard University — *Boston, MA*
Harvard Data Science Initiative PostDoctoral Fellow — *Apr 2020 - Present*

University of Utah — *Salt Lake City, UT*
PhD in Computing, Data Track — *Sep 2016 - Mar 2020*

Harvard Extension School — *Boston, MA*
Masters in Software Engineering — *Jan 2012 - Jul 2016*

University of Massachusetts, Dartmouth — *Boston, MA*
Masters in Physical Oceanography — *Sep 2007 - Jul 2009*

University of São Paulo, São Paulo — *São Paulo, Brazil*
Bachelors in Oceanography — *Jan 2002 - Dec 2006*

Awards and Scholarships

- **IEEE VIS Best Dissertation Honorable Mention, 2020**
- **Harvard Data Science Initiative Fellowship, 2020**
- **Wojcicki Troper HDSI Postdoctoral Fellow, 2020**

Grants

- **Seeing is Believing? How Data Visualization Affects Trust in Science**
  Awarded by the Harvard Data Science Initiative as part of the Trust in Science RFP.
  Role: Lead. Funding amount: 100K.

Service Roles

- **Archive Chair IEEE VIS**, 2021 and 2022.
- **BioVis@VIS Co-Chair**, 2019
- **Program Committee Memberships:**
  IEEE VIS Short Papers 2020
  IEEE VIS Papers 2021
- **Reviewing**
  VIS, 2019, 2020, 2021
  CHI, 2020, 2021, 2022
  EuroVis, 2020, 2021
  TVCG, 2019, 2020, 2021
- **Committee member** for Harvard SEAS Masters in Data Science Admissions, 2022
- **Committee member** on Harvard Data Science Initiative Grant Review Panel, 2021

Talks / Tutorials / Panels

- **reVISit: Looking Under the Hood of Interactive Visualization Studies**
  Paper Talk at CHI, Virtual Conference, 05-26-2021
- **Evaluating Interactive Multivariate Network Visualization Techniques using a Validated Design and Crowd-Sourcing Approach**
  Paper Talk at CHI, Virtual Conference, 05-24-2020
- **Visualizing Multivariate Networks: challenges and solutions**
  Invited Talk at Northeastern University, 11-01-2019
- **Visualizing Multivariate Networks**
  Doctoral Colloquium Talk, IEEE VIS, Vancouver, Canada, 10-19-2019
- **Visualizing Multivariate Networks: an overview of the state of the art**
  Invited Talk at Harvard University, 06-14-2019
- **The State of the Art in Visualizing Multivariate Networks**
  Paper Talk at EuroVis, Porto, Portugal, 06-03-2019
- **Juniper: A Tree+Table Approach to Multivariate Graph Visualization**
  Paper Talk at IEEE VIS, Berlin, Germany, 10-26-2018
- **Lineage: Visualizing Multivariate Clinical Data in Genealogy Graphs**
  Paper Talk at IEEE VIS, Berlin, Germany, 10–24-2018

- **Tutorial on Visualizing Multivariate Networks**
  Carolina Nobre, Marc Streit, Alexander Lex, IEEE VIS, Vancouver, Canada, 2019

- **Panel on the Ethics of Crowdsourcing in VIS**
  Moderator, IEEE VIS 2021
- **Panel on Algorithm-assisted decision making in child welfare**
  Moderator, HDSI Bias^2 Seminar Series, 2020
- **Panel on the Future of Teaching and Learning**
  Panelist, Gensler, 2020

Teaching Experience

Part-Time Lecturer
Boston, MA

INSH 5302: Information Design and Visual Analytics (Northeastern University) — *Spring 2022*

- Creating lecture content and teaching undergrads, Masters, and PhD students

Adjunct Faculty
Boston, MA

ISYS6645 - Data Visualization (Boston College) — *Fall 2021, Spring 2022*

- Creating lecture content and teaching undergrads and MBA students

Teaching Fellow
Boston, MA

CS-171 - Data Visualization (Harvard School of Engineering) — *Fall 2020, Fall 2021*

- Developing and grading homeworks
- Creating and running coding labs

Teaching Fellow
Boston, MA

CS-271 - Topics in Data Visualization (Harvard School of Engineering) — *Spring 2021, Spring 2022*

- Leading paper discussions
- Mentoring class projects

Guest Lecturer
Boston, MA

BMI 706 - Data Science II: Data Visualization for Biomedical Applications (Harvard Medical School) — *Spring 2020*

- Taught the Network Visualization lectures for BMI 706

Teaching Lead
Vancouver, British Columbia

Multivariate Network Visualization Tutorial - IEEE VIS — *Oct. 2019*

- Developed and taught a full day tutorial on visualizing multivariate networks at the IEEE VIS 2019 conference.

Teaching Fellow
Salt Lake City, UT

CS-6630 Visualization for Data Science (University of Utah) — *Fall 2017, Fall 2018*

- Teaching lectures
- Developing and grading homeworks
- Creating and running coding labs

Publications

- **Carolina Nobre**, Marc Streit, Miriah Meyer, Alexander Lex
  Multivariate Network Visualization Synthesis Lecture Book
  to appear in Morgan & Claypool Synthesis Lecture Series, 2022

- Daniel Rodrigues, Joel Martinez, Priyan Vaithilingam, Johanna Beyer, **Carolina Nobre**
  Protograph: An Approachable and Extensible Toolkit for Graph Visualization and Animation
  Preprint, 2022

- Yalong Yang, Wenyu Xia, Fritz Lekschas, **Carolina Nobre**, Robert Krueger, Hanspeter Pfsiter
  The Pattern is in the Details: An Evaluation of Interaction Techniques for Locating, Searching, and Contextualizing Details in Multivariate Matrix Visualizations
  To appear in Proceedings of the 2022 CHI Conference on Human Factors in Computing Systems, 2022

- **Carolina Nobre**, Dylan Wootton, Zack Cutler, Lane Harrison, Hanspeter Pfister, Alexander Lex
  reVISit: Looking Under the Hood of Interactive Visualization Studies
  In Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems (pp. 1-13). 2021

- Kiran Gadhave, Jochen Görtler, Zach Cutler, **Carolina Nobre**, Oliver Deussen, Miriah Meyer, Jeff Phillips, Alexander Lex
  Predicting Intent Behind Selections in Scatterplot Visualizations
  Information Visualization, 20(4): 207–228, doi:10.1177/14738716211038604, 2021.

- Tica Lin, Rishi Singh, Yalong Yang, **Carolina Nobre**, Johanna Beyer, Maurice A. Smith, and Hanspeter Pfster.
  Towards an Understanding of Situated AR Visualization for Basketball Free-Throw Training
  In Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems, 2021

- Spandan Madan, S, Bylinskii Z, **Carolina Nobre**, Tancik M, Recasens A, Zhong K, Alsheikh S, Oliva A, Durand F, and Pfister H
  Parsing and Summarizing Infographics with Synthetically Trained Icon Detection
  2021 IEEE 14th Pacific Visualization Symposium (PacificVis), 2021

- **Carolina Nobre**, Dylan Wootton, Lane Harrison, Alexander Lex
  Evaluating Interactive Multivariate Network Visualization Techniques using a Validated Design and Crowd-Sourcing Approach
  In Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems, pp. 1-12. 2020

- **Carolina Nobre**, Marc Streit, Miriah Meyer, Alexander Lex
  The State of the Art in Visualizing Multivariate Networks
  Computer Graphics Forum (EuroVis '19), 38: 807-832, doi:10.1111/cgf.13728, 2019.

- Alex Bigelow, **Carolina Nobre**, Miriah Meyer, Alexander Lex
  Origraph: Interactive Network Wrangling
  In 2019 IEEE Conference on Visual Analytics Science and Technology (VAST), pp. 81-92. IEEE, 2019.

- **Carolina Nobre**, Marc Streit, Alexander Lex
  Juniper: A Tree+Table Approach to Multivariate Graph Visualization
  IEEE Transactions on Visualization and Computer Graphics (InfoVis '18), 25(1): 544-554, doi:10.1109/TVCG.2018.2865149, 2019.

- **Carolina Nobre**, Nils Gehlenborg, Hilary Coon, Alexander Lex
  Lineage: Visualizing Multivariate Clinical Data in Genealogy Graphs
  IEEE Transactions on Visualization and Computer Graphics, 25(3): 1543-1558, doi:10.1109/TVCG.2018.2811488, 2019.

- **Carolina Nobre**, Alexander Lex
  OceanPaths: Visualizing Multivariate Oceanography Data
  Proceedings of the Eurographics Conference on Visualization (EuroVis '15) - Short Papers, doi:10.2312/eurovisshort.20151124, 2015.

- **Carolina Nobre**
  Deploying Moorings on the Ocean Floor
  Workshop Proceedings, VisWeek 2015, Chicago.

Thesis Papers

- **Doctoral Thesis:** Multivariate Network Visualization
  Advisor: Dr. Alexander Lex
  Institution: University of Utah
  Publication date: March 2020
  Best Dissertation Honorable Mention, IEEE VIS 2020

- **Masters Thesis:** The Signature of the NAO and Melt Water Advection on the Gulf of Maine Region during 1995 - 1998
  Advisor: Dr. Avijit Gangopadhyay
  Institution: School of Marine Science and Technology, UMASS Dartmouth
  Publication date: July 2009

- **Bachelor's Thesis:** Salinity and temperature characteristics of the Bay of Santos
  Advisor: Dr. Ilson da Silveira
  Institution: University of São Paulo
  Publication date: January 2006

Work Experience

Google X
Mountain View, CA

Software Engineer Intern — *June 2018 - Aug. 2018*

- Development of interactive tools in support of internal projects
- Development of visualization to aid domain experts in analyzing biological data

Harvard Medical School
Boston, MA

Data Visualization Research Intern — *June 2017 - Aug. 2017*

- Development of visualization for clinical data, such as NHANES
- Development of visualization using data from the PIC-SURE API

Woods Hole Oceanographic Institution
Woods Hole, MA

Research Associate — *Feb 2011 - Aug. 2016*

- Developing software to facilitate data processing and visualization both at sea and on land
- Developing and managing websites for research projects
- Data acquisition and processing during field experiments aboard research vessels

Horizon Marine
Marion, MA

Oceanography Analyst — *July 2009 - Feb. 2011*

- Processing and analyzing satellite imagery to determine ocean current conditions
- Development of Matlab scripts for automating data analysis process

Skills

Programming / Vis Tools D3, Tableau, Javascript, Python, R, Matlab, Cypher QL, SQL, Cloud Computing
Design Software Adobe Photoshop, Adobe Illustrator, Adobe Premiere, Adobe XD
Platforms Firebase, Neo4J, AWS, Docker