

Rebecca Faust

Assistant Professor
Department of Computer Science
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Current Appointment

Assistant Professor
Department of Computer Science, Tulane University
New Orleans, LA

Research Interests

Data Visualization, Explainable Analytics, Human-AI Interaction, Human-in-the-loop analytics, Dimension Reduction, Semantic Interaction, Visual Debugging, Visualization for Data Analytics

Education

Postdoctoral Researcher	Jan. 2022 - Dec. 2023
Virginia Tech	Blacksburg, VA
Mentor: Dr. Chris North	
<i>Interests:</i> Visual explanation in interactive projections	
PhD in Computer Science	Aug. 2016 - Dec. 2021
M.S. in Computer Science	Aug. 2016 - May 2020
University of Arizona	Tucson, AZ
Advisor: Carlos Scheidegger	
Dissertation: “A Visualization First Perspective on Understanding Program Behavior”	
Bachelor of Science in Computer Science	Aug. 2012 - May 2016
Bachelor of Arts in Mathematics	Aug. 2012 - May 2016
University of Montana	Missoula, MT
GPA: 3.94, High Honors	

Research Funding

- Faust, North, Interactive Semantic Explanations for Deep Learning Visualizations, CRA/NSF, 01/2022-12/2023, \$280,768, 100% responsibility Faust.

Publications

- W. Liu, C. North, **R. Faust**. *Explainable Dimension Reduction of Text Embeddings using Gradients* (submitted to IEEE VIS 2024)
- J. Xu, S. Hamal, J. Wenskovitch, C. North, **R. Faust**. *GXDR: Gradient-Based Explanations of Dimension Reduction Plot*. (submitted to IEEE VIS 2024)
- D. Palamarchuk, L. Williams, B. Mayer, T. Danielson, **R. Faust**, L. Deschaine, C. North. *Visualizing Temporal Topic Embeddings with a Compass*. (submitted to IEEE VIS 2024)
- Y. Bian, **R. Faust**, C. North. *NeuralSI: Neural Design of Semantic Interaction for Interactive Deep Learning*. arXiv preprint, arXiv:2402.17178v1, 2024
- **R. Faust**, C. Scheidegger, C. North. *Aardvark: Comparative Visualization of Data Analysis Scripts*. 2023 IEEE Visualization in Data Science (VDS), IEEE, 2023.
- H. Han, **R. Faust**, B. Norambuena, J. Li, S. Li, and C. North. *Explainable Interactive Projections of Images*. Machine Vision and Applications 34, 100 (2023).
- H. Han, **R. Faust**, B. Norambuena, R. Prabhu, T. Smith, S. Li, and C. North. *Explainable Interactive Projections for Image Data*. Advances in Visual Computing: 17th International Symposium, ISVC 2022, Proceedings, Part I. Cham: Springer International Publishing, 2022
- **R. Faust**, C. Scheidegger, K. Isaacs, W. Bernstein, M. Sharp, C. North. *Interactive Visualization for Data Science Scripts*. 2022 IEEE Visualization in Data Science (VDS), IEEE, 2022.
- **R. Faust**, D. Glickenstein, C. Scheidegger. *DimReader: Axis Lines that Explain Non-linear Projections*. IEEE Transactions on Visualization and Computer Graphics, 2018 (Proceedings of IEEE VIS 2018, 25.7% acceptance rate)

Honors and Awards

Computing Innovations Postdoctoral Fellowship	Jan. 2022 - Dec. 2023
NIST GMSE Fellowship	May 2018 - Dec. 2021
University of Arizona Computer Science Graduate Teaching Award	May 2021
University of Arizona Computer Science Graduate Research Award	May 2019
Galileo Circle Scholar	May 2018
University of Arizona Graduate Fellowship	Aug. 2016
Mortar Board Outstanding Senior Award in Computer Science	May 2016
Mortar Board Outstanding Senior Award in Mathematics	May 2016
Montana University System Scholarship - full tuition waiver	Aug. 2012 - May 2016
University of Montana Honors Scholarship	Aug. 2012 - May 2016

Teaching

Instructor - Tulane University

- CMPS 3360/6360 - Data Visualization, Spring 2024

Instructor - University of Arizona

- CSc 245 - Introduction to Discrete Structures (Remote/Online), Summer 2020
- CSc 245 - Introduction to Discrete Structures (Remote/Online), Summer 2021

Talks

- “DimReader: Axis Lines that Explain Non-Linear Projections”, IEEE VIS Conference, Berlin, Germany, October 23, 2018
- “A Visualization First Perspective on Understanding Program Behavior”, Colloquium at University of Montana, November 30, 2021
- “Interactive Visualization for Data Science Scripts” Symposium on Visual Data Science at IEEE VIS, October 16, 2022
- “Aardvark: Comparative Visualization for Data Analysis Scripts” Symposium on Visual Data Science at IEEE VIS, October 23, 2023

Posters

- *DimReader: Using auto-differentiation to explain non-linear projections.* R. Faust, C. Scheidegger, IEEE VIS 2017
- *Interactive Dimension Reduction with Explainable Deep Learning for Image Sorting.* R. Faust, NITRD 30th Symposium, 2022.

Professional Activities

Workshops Organized:

J. Harden, A. Wang, **R. Faust**, K. Isaacs, N. Kirshenbaum, J. Wenskovitch, J. Zhao, C. North. “Human-Notebook Interactions: The CHI of Computational Notebooks” at *ACM CHI*, Honolulu, HI, 2024

Reviewer	EuroVis 2024 IEEE VIS 2023, TVCG 2023 IEEE VIS 2022, TVCG 2022, CG&A 2022 InfoVis 2020, VAST 2020, EuroVis 2020, TKDE 2020 InfoVIS 2019, EuroVis 2019
Student Volunteer	IEEE VIS 2018

Department Service

Member	Feb. 2024 - present
Graduate Studies Committee	
Tulane University, Computer Science Department	
Treasurer & Founding Member	Sept. 2018 - May 2020
Graduate Student Council	
University of Arizona Computer Science Department	
Graduate Student Member	Mar. 2018 - May 2018
Department Head 5-year Review Committee	
Graduate Student Member	Sept. 2019 - Feb. 2020
Computer Science Department 7-year Academic Program Review Committee	

Additional Experience

Engineering Laboratory, NIST	Gaithersburg, MD
GMSE Summer Fellow	Summer 2018, Summer 2019
Supervisor: Dr. William Bernstein	
<i>Research topic:</i> Visual Debugging for data science programs	
Agile Data Solutions	Missoula, MT
Software Testing and Development	May 2014 - Dec. 2015
<i>Role:</i> Testing and front end development of content categorization software	

Computer Skills

Programming Languages: Python, Javascript, HTML, C/C++, SQL, C#, R
Libraries and Tools: Numpy, Scikit learn, D3, Vega-lite