

# Dr. Rebecca Faust

ASSISTANT PROFESSOR · TULANE UNIVERSITY

Office: Paul Hall 306, Phone: (504) 247-1413  
6823 St. Charles Ave, New Orleans LA 70118

✉ [rfaust1@tulane.edu](mailto:rfaust1@tulane.edu)

🌐 <http://rjfaust.github.io/>

## Current Appointment

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### **Tulane University**

*New Orleans, LA*

ASSISTANT PROFESSOR

*Jan. 2024 -*

- Department of Computer Science

## Research Interests

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

## Education

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### **University of Arizona**

*Tucson, AZ*

PHD IN COMPUTER SCIENCE

*Aug. 2016 - Dec. 2021*

M.S. IN COMPUTER SCIENCE

*Aug. 2016 - May 2020*

- Advisor: Carlos Scheidegger
- Dissertation: “A Visualization First Perspective on Understanding Program Behavior”

### **University of Montana**

*Missoula, MT*

BS IN COMPUTER SCIENCE

*Aug. 2012 - May 2016*

BA IN MATHEMATICS

*Aug. 2012 - May 2016*

## Professional Experience

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### **Virginia Tech**

*Blacksburg, VA*

POSTDOCTORAL RESEARCHER

*Jan. 2022 - Dec. 2023*

- Mentor: Dr. Chris North
- *Interests:* Visual explanation in interactive projections

### **University of Arizona**

*Tucson, AZ*

GRADUATE RESEARCHER

*Aug. 2016 - Dec. 2021*

- Advisor: Dr. Carlos Scheidegger
- *Research topic:* Visual explanation of data science programs

### **Engineering Laboratory, NIST**

*Gaithersburg, MD*

GMSE SUMMER FELLOW

*Summer 2018, Summer 2019*

- Supervisor: Dr. William Bernstein
- *Research topic:* Visual Debugging for data science programs

## Agile Data Solutions

Missoula, MT

SOFTWARE TESTING AND DEVELOPMENT

May 2014 - Dec. 2015

- *Role:* Testing and front end development of content categorization software

## Grants & Funding

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### EXTERNAL FUNDING AWARDED

|           |                                                                                                                                                                    |           |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| 2022-2023 | <b>Interactive Semantic Explanations for Deep Learning Visualizations.</b> Rebecca Faust, Chris North. Computing Research Association/National Science Foundation. | \$280,768 |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|

### EXTERNAL FUNDING PROPOSALS (UNDER REVIEW)

|      |                                                                                                                                                                                                                                                                                                               |             |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| 2026 | <b>Human-AI Collaborative Core Analysis for Multi-Proxy Climate Reconstruction.</b> Rebecca Faust (PI), Tom DeCarlo (Co-PI). National Science Foundation Collaborations in AI and Geosciences. (Under Review)                                                                                                 | \$669,478   |
| 2026 | <b>Autonomous Synthesis of Materials for Use in Energy Storage Systems.</b> Hank Ashbaugh (PI), Michael Naguib (Co-PI), Ritesh Sachan (Co-PI), Krishna Shah (Co-PI), Julie Albert, Ben Choe, Rebecca Faust, Lamar Meda, Matt Montemore, George Nelson. National Science Foundation EPSCoR FEC. (Under Review) | \$3,884,758 |
| 2025 | <b>TreeTracer: enabling multi-dimensional and transparent tree-ring analyses.</b> Tom DeCarlo (PI), Rebecca Faust (Co-PI). National Science Foundation Cyberinfrastructure for Sustained Scientific Innovation. (Under Review)                                                                                | \$599,479   |

### INTERNAL FUNDING AWARDED

|             |                                                                                                                                                                                                             |          |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| 2026 - 2027 | <b>Design and Study of Haptic Data Representations on Smartphone Devices.</b> Tulane COR Research Fellowship.                                                                                               | \$10,000 |
| 2024-2025   | <b>The Effects of Subject-Matter on the Perception of Data Quality in Uncertainty Visualization.</b> Tulane Center for Engaged Learning & Teaching (CELT) Award for Faculty Mentored Undergraduate Research | \$2,793  |

## Research Publications

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### PEER REFEREED PUBLICATIONS

- [1] **W. Liu**, E. Krokos, K. Whitley, **R. Faust**, and C. North, “llm-augmented semantic steering of text embedding projection spaces,” *Advanced Visual Interfaces (AVI)*, 2026 (to appear).
- [2] D. Palamarchuk, L. Williams, B. Mayer, T. Danielson, **R. Faust**, L. Deschaine, and C. North, “Visualizing temporal topic embeddings with a compass,” *IEEE Transactions on Visualization and Computer Graphics*, vol. 31, no. 1, pp. 272–282, 2025. [DOI: 10.1109/TVCG.2024.3456143](https://doi.org/10.1109/TVCG.2024.3456143).
- [3] **J. Lin**, **R. Faust**, and C. North, “Imagesi: Semantic interaction for deep learning image projections,” in *2024 IEEE Visualization and Visual Analytics (VIS)*, 2024, pp. 91–95. [DOI: 10.1109/VIS55277.2024.00026](https://doi.org/10.1109/VIS55277.2024.00026).

- [4] J. Rogers, M. Anastacio, J. Bernard, M. Chakhchoukh, **R. Faust**, A. Kerren, S. Koch, L. Kotthoff, C. Turkay, and E. Wall, “Visualization and automation in data science: Exploring the paradox of humans-in-the-loop,” in *2024 IEEE Visualization in Data Science (VDS)*, 2024, pp. 1–5. [DOI: 10.1109/VDS63897.2024.00005](#).
- [5] **R. Faust**, C. Scheidegger, and C. North, “Aardvark: Comparative visualization of data analysis scripts,” in *2023 IEEE Visualization in Data Science (VDS)*, 2023, pp. 30–38. [DOI: 10.1109/VDS60365.2023.00009](#).
- [6] H. Han, **R. Faust**, B. F. Keith Norambuena, **J. Lin**, S. Li, and C. North, “Explainable interactive projections of images,” *Machine Vision and Applications*, vol. 34, no. 6, p. 100, 2023.
- [7] **R. Faust**, C. Scheidegger, K. Isaacs, W. Z. Bernstein, M. Sharp, and C. North, “Interactive visualization for data science scripts,” in *2022 IEEE Visualization in Data Science (VDS)*, 2022, pp. 37–45. [DOI: 10.1109/VDS57266.2022.00009](#).
- [8] H. Han, **R. Faust**, B. Norambuena, R. Prabhu, T. Smith, S. Li, and C. North, “Explainable interactive projections for image data,” in *International symposium on visual computing*, Springer, 2022.
- [9] **R. Faust**, D. Glickenstein, and C. Scheidegger, “Dimreader: Axis lines that explain non-linear projections,” *IEEE transactions on visualization and computer graphics*, vol. 25, no. 1, pp. 481–490, 2018.

#### PEER REFEREED WORKSHOP PAPERS

- [1] **W. Liu**, C. North, and **R. Faust**, “Visualizing spatial semantics of dimensionally reduced text embeddings,” *NLViz Workshop*, 2024. arXiv: 2409.03949 [cs.HC]. [URL: https://arxiv.org/abs/2409.03949](#).

#### WORKSHOP PROPOSALS

- [1] J. Harden, A. Y. Wang, **R. Faust**, K. E. Isaacs, N. Kirshenbaum, J. Wenskovitch, J. Zhao, and C. North, “Human-notebook interactions: The chi of computational notebooks,” in *Extended Abstracts of the CHI Conference on Human Factors in Computing Systems*, ser. CHI EA '24, Honolulu, HI, USA: Association for Computing Machinery, 2024, ISBN: 9798400703317. [DOI: 10.1145/3613905.3636318](#).

#### MANUSCRIPTS

- [1] Y. Bian, **R. Faust**, and C. North, *Neuralsi: Neural design of semantic interaction for interactive deep learning*, 2023.

## Professional Activities

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#### WORKSHOPS ORGANIZED:

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

#### TALKS:

- Oct. 2024      “ImageSI: Semantic Interaction for Deep Learning Image Projections”  
IEEE VIS Conference, Virtual.
- Oct. 2023      “Aardvark: Comparative Visualization for Data Analysis Scripts”  
Symposium on Visual Data Science at IEEE VIS, Melbourne, Australia.
- Oct. 2022      “Interactive Visualization for Data Science Scripts”  
Symposium on Visual Data Science at IEEE VIS, Oklahoma City, Oklahoma.
- Nov. 2021      “A Visualization First Perspective on Understanding Program Behavior”  
Colloquium at University of Montana, Virtual.
- Oct. 2018      “DimReader: Axis Lines that Explain Non-Linear Projections”, IEEE VIS  
Conference, Berlin, Germany.

## POSTERS

- Nov. 2021      *Interactive Dimension Reduction with Explainable Deep Learning for Image  
Sorting.* R. Faust, NITRD 30th Symposium, 2022
- Oct. 2017      *DimReader: Using auto-differentiation to explain non-linear projections.*  
R. Faust, C. Scheidegger, IEEE VIS Conference, Phoenix, Arizona.

## Mentoring

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### PH.D. ADVISEES:

- Khalaila, Areen, Ph.D. in CS, (Co-advised), 2025 - present
- Yongbo Chen, Ph.D. in CS, 2024-present
- Yan Zhu, Ph.D. in CS, 2024-present
- Wei Liu, Ph.D. in CS, Virginia Tech (Co-advised), 2022 - present, Expected 2026

### MASTER’S STUDENT ADVISEES:

- Jiayue Lin, M.S. in CS, Virginia Tech, Spring 2024  
”ImageSI: Interactive Deep Learning for Image Semantic Interaction”,
- Sahil Hamal, M.S. in CS, Virginia Tech, Spring 2023  
”Interpreting Dimension Reductions through Gradient Visualization”.

### UNDERGRADUATE STUDENT ADVISING

- Former Undergraduate Students:
  - Abby Scarry, C.S. Major, Spring 2024 - Spring 2025

### THESIS COMMITTEES SERVED ON

- **PhD:** Fangzheng Wu (B. Summa, CS), Wei Liu (R. Faust, C. North)
- **M.S.:** Sahil Hamal (R. Faust, CS), Jiayue Lin (R. Faust, CS), Lemara Williams (C. North, CS)

### UNDERGRADUATE CAPSTONE ADVISEES

| Term      | Project                                        | Students                                            |
|-----------|------------------------------------------------|-----------------------------------------------------|
| 2025 -    | HealthVis: Accessibility Health Visualizations | Emily Aymond, Madeline Davis, Jaimie Morris         |
| 2024-2025 | Astraea Legal Case Predictions                 | Killian Daly, Reed Miller, Henry Miller, Duke Glenn |

## Honors and Awards

|                       |                                                                |
|-----------------------|----------------------------------------------------------------|
| Oct. 2024             | Best Paper, Visual Data Science (VDS) Symposium at IEEE VIS.   |
| Jan. 2022 - Dec. 2023 | Computing Innovations Postdoctoral Fellowship                  |
| May 2018 - Dec. 2021  | NIST GMSE Fellowship                                           |
| May 2021              | University of Arizona Computer Science Graduate Teaching Award |
| May 2019              | University of Arizona Computer Science Graduate Research Award |
| May 2018              | Galileo Circle Scholar                                         |

## Teaching

### COURSES TAUGHT AT TULANE UNIVERSITY

- CMPS 3160/6160 - Introduction to Data Science, Fall 2025
- CMPS 3360/6360 - Data Visualization, Spring 2025
- CMPS 3160/6160 - Introduction to Data Science, Fall 2024
- CMPS 3360/6360 - Data Visualization, Spring 2024

### COURSES TAUGHT AT UNIVERSITY OF ARIZONA

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

### STUDENT EVALUATIONS

| Term    | Course                                | Enrolled | Responses | Instructor | Course |
|---------|---------------------------------------|----------|-----------|------------|--------|
| F 2025  | CMPS 3160/6160: Intro to Data Science | 31       | 29        | 4.55       | 4.55   |
| Sp 2025 | CMPS 3360/6360: Data Visualization    | 39       | 31        | 4.48       | 4.32   |
| F 2024  | CMPS 3160/6160: Intro to Data Science | 38       | 33        | 4.21       | 4.25   |
| Sp 2024 | CMPS 3360/6360: Data Visualization    | 22       | 9         | 4.11       | 3.89   |

## Service Activities

### PROFESSIONAL SERVICE

|                     |                                                                    |
|---------------------|--------------------------------------------------------------------|
| Grant Review Panels | National Science Foundation (NSF), Directorate for CISE, IIS. 2025 |
| PC Member           | EuroVis Full Papers 2026                                           |

|                   |                                                      |
|-------------------|------------------------------------------------------|
|                   | EuroVis Short Papers 2026                            |
|                   | IEEE VIS Full Papers 2025                            |
|                   | EuroVis Short Papers 2025                            |
|                   | ISVC 2024                                            |
| Reviewer          | ACM CHI 2026, TVCG 2026                              |
|                   | EuroVis 2025, ACM CHI 2025, TVCG 2025, IEEE VIS 2025 |
|                   | EuroVis 2024, IEEE VIS 2024, TVCG 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                                        |

#### INSTITUTIONAL SERVICE

##### **Tulane Committees**

|                     |                                                                                           |
|---------------------|-------------------------------------------------------------------------------------------|
| Aug. 2025 - Present | University Senate Student Affairs Committee<br>SSE Representative<br>Tulane University    |
| Aug. 2024 - Present | Wheeler Chair Committee<br>Member<br>Department of Computer Science, Tulane University    |
| July 2024 - Present | Processes Committee<br>Member<br>Department of Computer Science, Tulane University        |
| Feb. 2024 - Present | Graduate Studies Committee<br>Member<br>Department of Computer Science, Tulane University |

##### **Previous Institutions**

|                       |                                                                                                                                            |
|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| Sep. 2018 - May 2020  | Graduate Student Council<br>Treasurer & Founding Member<br>Department of Computer Science, University of Arizona                           |
| Sep. 2019 - Feb. 2020 | CS Department 7-year Academic Program Review Committee<br>Graduate Student Member<br>Department of Computer Science, University of Arizona |

Mar. 2018 - May 2018    Department Head 5-year Review Committee  
Graduate Student Member  
Department of Computer Science, University of Arizona

## Professional Development

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**CRA Career Mentoring Workshop**, Washington DC, 2024.

**NSF CISE Career Workshop**, Virtual, 2024.