# Ghulam Jilani Quadri

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## Research Interest

Ghulam Jilani Quadri is an incoming tenure track Assistant Professor in Computer Science at the Gallogy College of Engineering, University of Oklahoma. He is currently a Postdoctoral Research Associate and CRA/CCC/NSF Computing Innovation Fellow in the Department of Computer Science at the University of North Carolina-Chapel Hill, working with Dr. Danielle Albers Szafir. Quadri earned his Ph.D. in Computer Science & Engineering from the University of South Florida in 2021, advised by Dr. Paul Rosen. He holds an M.S. in Computer Science from the University of South Florida and a B.E in Computer Engineering from the University of Mumbai.

Quadri develops visualization systems and techniques with optimized design choices for exploring and analyzing large and complex data in domains ranging from health and energy to the humanities. His work focuses on increasing the scalability, clarity, and comprehensibility of information visualization by quantifying perception and cognition for design. Quadri's research lies at the intersection of Information Visualization, HCI, ML Models, and perception & cognition. His primary goal is to create a perceptual and human-centered framework to optimize visualization design, improving decision-making quality and confidence, while providing objective guidance for designers.

His research contributions have received significant support, funding, and recognition, including honorable mentions at the VAST Challenge 2017, an NSF Computing Innovation Fellowship in 2021, the IEEE VGTC Best Dissertation Award in 2022, and honorable mentions for the Best Paper Award at IEEE VIS 2023.

## Education

**University of South Florida** — Tampa, FL
Ph.D. in Computer Science and Engineering, GPA: 4.0 — 2017 –2021

- Advisor: Dr. Paul Rosen
- Dissertation Title: "Constructing Framework for Task-Optimized Visualization"
  🏆 *2022 VGTC Dissertation Award*
  🏆 *2021 Dissertation Completion Fellowship *
- Committee Members: Shaun Canavan, John Licato, Mahshid Naeini, Brenton Wiernik.

**University of South Florida** — Tampa, FL
M.S in Computer Science, GPA: 4.0 — 2015 –2017

**University of Mumbai** — Mumbai, India
B.E. in Computer Engineering, GPA: 3.8 — 2009 –2012

## Awards & Honors

- IEEE VIS Best Paper Honorable Mention Award (Top 5% Submission) — 2023
- IEEE VGTC Best Dissertation Award: Visualization — 2022
- CRA-NSF: 2021 Computing Innovation Fellow — 2021
- Dissertation Completion Fellowship - University of South Florida — 2021
- Doctoral Colloquium - IEEE VIS — 2020

- ACM Richard Tapia Conference - Tableau Tapia Scholar                                     2020
- Indeevar and Srinath Memorial Scholarship - College of Engineering                       2020
- Spirit of Innovation Award - College of Engineering                                      2019
- IEEE VAST Challenge Honorable Mention                                                    2017

## EXPERIENCE

**Assistant Professor**                                                          2024 –Present
Department of Computer Science, Gallogy College of Engineering
University of Oklahoma                                                                Norman, OK

**Postdoctoral Research Associate || CIFellow 2021**                                 2022 –2024
Department of Computer Science, University of North Carolina-Chapel Hill          Chapel Hill, NC
Advisor: Dr. Danielle Albers Szafir

**Graduate Research Assistant**                                                      2017 –2021
Graphics and Visualization Lab, University of South Florida                           Tampa, FL
Advisor: Dr. Paul Rosen

**Graduate Teaching Assistant**                                                      2017 –2021
Computer Science and Engineering, University of South Florida                         Tampa, FL

**NSF Innovation Corps Cohort**                                                     Summer 2017
University of South Florida                                                           Tampa, FL

**Software Engineering Intern**                                                        Fall 2016
LeapDoctor (A startup at USF Innovation Incubator)                                    Tampa, FL

**System Engineer**                                                                  2013 –2015
Infosys Limited                                                                      Pune, India

**Instructor**                                                                       2012 –2013
M.H. Saboo Siddik Polytechnic                                                      Mumbai, India

**Undergraduate Research Intern**                                                      Fall 2011
Tata Institute of Fundamental Research                                             Mumbai, India

## JOURNAL PUBLICATIONS

[1]  H. Jeon*, **Quadri, Ghulam Jilani\***, H. Lee, P. Rosen, D. A. Szafir, and J. Seo, "Clams: A cluster
     ambiguity measure for estimating perceptual variability in visual clustering", *IEEE Transactions on
     Visualization and Computer Graphics*, 2024,
     🏆 **Best Paper Honorable Mention Award (Top 5% submissions)**
     ∗ – equal Contribution.

[2]  **Ghulam Jilani Quadri**, J. A. Nieves, B. M. Wiernik, and P. Rosen, "Automatic scatterplot design
     optimization for clustering identification", *IEEE Transactions on Visualization and Computer Graphics*,
     2022.

[3]  **Quadri, Ghulam Jilani** and P. Rosen, "A survey of perception-based visualization studies by task",
     *IEEE Transactions on Visualization and Computer Graphics*, 2021.

[4] **Quadri, Ghulam Jilani** and P. Rosen, "Modeling the influence of visual density on cluster perception in scatterplots using topology", *IEEE Transactions on Visualization and Computer Graphics*, vol. 27, no. 2, pp. 1829–1839, 2020.

[5] P. Rosen and **Quadri, Ghulam Jilani**, "Linesmooth: An analytical framework for evaluating the effectiveness of smoothing techniques on line charts", *IEEE Transactions on Visualization and Computer Graphics*, vol. 27, no. 2, pp. 1536–1546, 2020.

## Conference & Workshop Publications

[6] S. Malla, A. Tuladhar, **Quadri, Ghulam Jilani**, and P. Rosen, "Multi-spectral satellite image analysis for feature identification and change detection vast challenge 2017: Honorable mention for good facilitation of single image analysis)", in *2017 IEEE Conference on Visual Analytics Science and Technology (VAST)*, 2017
🏆 **VAST Challenge 2017 Honorable Mention**.

[7] R. Dilshaad, **Quadri, Ghulam Jilani**, and P. Rosen, "Exploring annotation strategies in professional visualizations: Insights from prominent us news portals", in *In Proceedings of VIS'23: IEEE Conference on Visualization. Workshop on Visualization on Communication(VisComm)*, 2023.

[8] C. Tseng, **Quadri, Ghulam Jilani**, Z. Wang, and D. Szafir, "Measuring categorical perception in color-coded scatterplots", in *(To be appearing) In Proceedings of ACM CHI' 2023: ACM Conference on Human Factors in Computing Systems*, 2023.

[9] R. Dilshaad, **Quadri, Ghulam Jilani**, and P. Rosen, "A qualitative evaluation and taxonomy of bar chart annotations", in *2022, Poster at IEEE Visualization Conference on Scientific Visualization, Information Visualization, and Visual Analytics*, 2022.

[10] R. Dilshaad, **Quadri, Ghulam Jilani**, and P. Rosen, "A qualitative evaluation and taxonomy of student annotations on bar charts", in *In Proceedings of VIS'22: IEEE Conference on Visualization. Workshop on Visualization on Communication(VisComm)*, 2022.

[11] **Quadri, Ghulam Jilani** and D. Szafir, "Eliciting high-level visual comprehension: A qualitative study", in *2022 Poster at IEEE Visualization Conference on Scientific Visualization, Information Visualization, and Visual Analytics*, 2022.

[12] **Quadri, Ghulam Jilani**, "Constructing frameworks for task-optimized visualizations", in *IEEE VIS Doctoral Colloquium.*, 2020.

[13] **Quadri, Ghulam Jilani** and P. Rosen, "You can't publish replication studies (and how to anyways)", in *In Proceedings of VIS'19: IEEE Conference on Visualization. Workshop on Vis X Vision*, 2019.

[14] **Quadri, Ghulam Jilani**, A. Tuladhar, S. Malla, and P. Rosen, "Visual analytic design for characterizing air-sampling sensor performance and operation", in *2017 IEEE Conference on Visual Analytics Science and Technology (VAST)*, 2017.

[15] A. Tuladhar, S. Malla, **Quadri, Ghulam Jilani**, and P. Rosen, "Data aggregation and visualization technique for traffic sensor data", in *2017 IEEE Conference on Visual Analytics Science and Technology (VAST)*, 2017.

## PREPRINTS & UNDER SUBMISSION

[P1] D. Rahman **Ghulam Jilani Quadri**, P. Rosen, "A Qualitative Evaluation and Taxonomy of Bar Chart Annotations", *(Under Revision)*

[P2] **Ghulam Jilani Quadri**, Z. Wang, Z. Wang, J. Adorno, P.Rosen, D. A. Szafir, "Do You See What I See? A Qualitative Study Eliciting High-Level Visualization Comprehension", *IEEE TVCG, 2023 (Under submission)*

[P3] **Ghulam Jilani Quadri**, Z. Wang, P.Rosen, D. A. Szafir, "A One-Stop Overdraw Problem Solution in Scatterplot", *IEEE TVCG, (Under submission)*

[P4] C. Alvarado, **Ghulam Jilani Quadri**, J. Adorno, and P.Rosen, "A Case-Study on Variations Observed in Accelerometers Across Devices", *arxiv*

[P5] C. Alvarado, **Ghulam Jilani Quadri**, J. Adorno,P.Rosen, and Miguel Labrador "Analysis of Accelerometer Data for Cross-Device Algorithm Support", *USF Research Experiences for Undergraduates (REU) at Ubiquitous Sensing Lab*, Summer 2019

## Thesis

[1] **Quadri, Ghulam Jilani**, "Constructing frameworks for task-optimized visualizations", University of South Florida, 2021, https://digitalcommons.usf.edu/etd/9213
🏆 **2022 IEEE VGTC Dissertation Award**.

## Grants

- **Computing Innovation Fellows 2021 Project** at University of North Carolina-Chapel Hill     2021
  $250000 awarded from National Science Foundation- Award NSF-CNS #2127309, 01/2022 - 12/2023
- **Dissertation Completion Fellowship Grant** at University of South Florida     Summer 2021
  $8000 awarded from Office of Graduate School for Dissertation Completion.
- **Doctoral Colloquium Travel Grant** at IEEE-VIS     2020 (virtual)
  Travel and Attendance award for Doctoral Colloquium.
- **ACM Richard Tapia Conference Travel Grant**     2020
  ACM Richard Tapia Celebration of Diversity in Computing.
- **International Travel Grant** at University of South Florida     2019
  $1500 from Office of Graduate School for international travel to attend IEEE-VIS conference.
- **NSF I-Corp** at University of South Florida     2017
  Funding of $4000 for working towards for ride-share load matching patent business implementation.

## Funding Proposal Development

- **Developing Perceptual Framework for Task-Optimized Visualization**     2021
  $250000 awarded from NSF, CISE/CCF, CRA-CCC as PI. Award # 5123598, 01/2022 - 12/2023

## Posters & Presentations

**Automatic Scatterplot Design Optimization for Clustering Identification**     October 2023
*IEEE VIS 2023, Melbourne, Australia*
[IEEE TVCG Accepted Conference Paper Presentation]

**Constructing Framework for Task-Optimized Visualization**     January 2023
*Seoul National University, South Korea (virtual)*
[Invited Research Talk at HCIL Lab]

**Developing Perceptual Framework for Task-Optimized Visualization**     November 2022
*Roux Institute, Portland (virtual)*
[Invited Research Talk]

**A Survey of Perception-Based Visualization Studies by Task**  October 2022
*IEEE VIS 2022, Oklahoma City*
[IEEE TVCG Accepted Conference Paper Presentation]

**Eliciting High-Level Visual Comprehension: A Qualitative Study**  October 2022
*IEEE VIS, Oklahoma City*
[Accepted Poster Presentation]

**Constructing Framework for Task-Optimized Visualization**  May 2022
*NSF- Networking in Information Technology Research and Development (NITRD) Symposium*
[Poster presented at CIFellow event, DC]

**Developing Perceptual Framework for Task-Optimized Visualization**  April 2022
*Computer Science Department, University of Massachusetts, Amherst (virtual)*
[Invited Research Talk at LASER Lab]

**Modeling the Influence of Visual Density on Cluster Perception**  October 2020
*IEEE VIS– InfoVis track, Salt Lake City (virtual)*
[Accepted Conference Paper Presentation]

**Doctoral Colloquium**  October 2020
*IEEE VIS, Salt Lake City (virtual)*
[Accepted Doctoral Proposal Presentation]

**Modelling Effective Visualization Using Graphical Encoding Perception**  November 2019
*Computer Science and Engineering Department, University of South Florida*
[Major Area Presentation for Dissertation Proposal]

**You Can't Publish Replication Studies (and How to Anyways)**  October 2019
*Vis X Vision workshop at IEEE VIS, Vancouver*
[Accepted Workshop Paper Presentation]

**Flit-Path Industry and Research Shadow Experience**  November 2018
*Computer Science and Engineering Department, University of South Florida*

**Modeling Cluster Multi-factor Perception in Scatterplots Using Merge Trees**  October 2018
*IEEE VIS, Berlin,* [Accepted Workshop Lightning Talk Presentation]

**MultiSpectral Satellite Image Analysis for Feature Identification & Detection**  October 2017
*IEEE VIS, Phoenix*
[Accepted VAST Challenge Presentation: Honorable Mention Award]

## TEACHING

- **Teaching Assistant** at University of South Florida  2017 –2021
  Interactive Data Visualization (CIS4930/6930) with 45 students, Spring 2021
  Computer Organization (CDA3103) with 60 students, Summer 2020
  Computer Info Networks (CNT4104) with 58 students, Spring 2020
  Malware Analysis & Reverse Engineering (COP4931) with 50 students, Spring 2020
  Data Visualization (CIS4930/6930) with 50 students, Spring 2018 & 2019
  Object Oriented Programming (COP2513) with 90 students, Spring 2019
  Principle of Computer Architecture (EEL6764) with 60 students, Fall 2017
  Analysis of Algorithm (COT4400) with 45 students, Summer 2016

- **Instructor** at University of South Florida  Summer 2017
  User-level Linux Intro to IT (COP3353) with 61 students

- **Instructor** at M.H.S.S. Polytechnic, Mumbai, India  2012 –2013
  Computer Fundamentals with 50 students (3 sections), Fall 2012.
  Computer Graphics with 40 students, Fall 2012
  Object Oriented Programming with 40 students, Spring 2013

# Mentoring Experience

- **Sub-Advising and Mentoring BS, MS and PhD students** at University of North Carolina     2022 –Present
  Chin Tseng (Ph.D. Student)
  Zeyu Wang (Ph.D. Student)
  Zhehao Wang (B.S. Student)
  Rosie Xiao (B.S. Student)
  Zhuowen Ye (B.S. Student)
  Charlotte Dorn (B.S. Student)
  Lama Abed (B.S. Student)
  Sophia Lin (B.S. Student)
  Feng Lin (B.S. Student)

- **Sub-Advising and Mentoring BS, MS and PhD students** at University of South Florida     2017 –2022
  Md Dilshadur Rahman (Ph.D. Student)
  Jennifer Adorno Nieves (Ph.D. Student)
  Carlos Jose Alejandro (B.S. and NSF REU Student)

# Leadership

**Tau Beta Pi, FL-G**     2017 –2019
Executive Board, University of South Florida

**Literature Club**     2017 –2019
President, University of South Florida

**Engineering Expo**     2018 –2020
Expo Club Director, University of South Florida

# Service & Reviewing

- **Organizing Committee**     2022 –Present
  IEEE VIS 2024, Tampa Bay, FL
  Vis X Vision Science at IEEE VIS and VSS (2023)

- **Program Committee**     2022 –Present
  IEEE Visualization Conference (IEEE VIS), Full Paper (2023)
  IEEE Visualization Conference (IEEE VIS), Short Paper (2022-2023)

- **Review**     2019 –Present
  ACM Conference on Human Factors in Computing (ACM CHI) (2024, 2023, 2022, 2021, 2020)
  IEEE Transactions on Visualization and Computer Graphics (IEEE TVCG) (2023, 2022, 2021)
  IEEE Visualization Conference (IEEE VIS) (2023, 2022, 2021, 2020)
  Information Visualization Journal (2023)
  Computer Graphics Forum Journal (CGF) (2023)
  IEEE Pacific Visualization Symposium (IEEE PacificVis) (2023, 2022)
  Eurographics Conference on Visualization (EuroVis) (2023, 2022, 2021, 2020)

- **Student Volunteering**     2017 –2022
  Student Volunteer Day Captain at ACM Conference on Human Factors in Computing(ACM CHI) (2022,2021)
  Student Volunteer Day Captain at IEEE Visualization Conference (IEEE VIS) (2019 - 2021)
  Student Volunteer at IEEE Visualization Conference (IEEE VIS) (2017 - 2021)

- **Service** at University of South Florida     2017 –2021
  Mentor for Research Experience for Undergraduate (REU), Summer 2019
  Student Academic Integrity Committee, 2019 - 2020

## Development

- Professional Development Workshop                                                    2021
- Graduate Communication Boot Camp - University of South Florida                       2021
- Summer Grant Writing Workshop - University of South Florida                          2020
- Preparing for College Teaching - University of South Florida                         2018
- ATLE Teaching Assistant Training - University of South Florida                   2018, 2017