Poorna Talkad Sukumar

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RESEARCH INTERESTS

Human-Computer Interaction; Information Visualization; Personal Data Visualization; Cognitive Biases in Visualizations; Visualization Design Studies; Qualitative Research

EDUCATION

July 2021 (expected) — **Ph.D. Computer Science and Engineering,** University of Notre Dame, USA
Advisors: Dr. Aaron Striegel and Dr. Ronald Metoyer
GPA: 4.0/4.0

2010 — **M.Sc. Mobile and Ubiquitous Computing,** Lancaster University, UK
Thesis: Enhanced Stance Phase Detection and Extended Kalman Filtering for Strapdown Pedestrian Dead Reckoning
Thesis Supervisor: Dr. Mike Hazas

2008 — **B.E. Computer Science and Engineering**, Dayananda Sagar College of Engineering, Bangalore, India

EMPLOYMENT

2016 - — **Graduate Research Assistant,** Department of Computer Science and Engineering, University of Notre Dame

2015 - 2016, 2018 — **Teaching Assistant,** Department of Computer Science and Engineering, University of Notre Dame

2012 - 2015 — **Project Associate,** Department of Computer Science and Automation, Indian Institute of Science, Bangalore, India

2011 - 2012 — **Software Developer,** Matter 2 Media, Bristol, UK

2010 - 2011 — **Research Assistant,** Computing Department, Lancaster University, UK

AWARDS AND RECOGNITIONS

2020 — Participant, *Doctoral Colloquium, IEEE VIS conference*

2019 — Outstanding Graduate TA Award, *Department of Computer Science and Engineering, University of Notre Dame*

2019 — Special Recognition for Outstanding Reviews, *CSCW'19 Papers and CHI'20 Papers*

2019 — Best Paper Honorable Mention Award, *"GameViews: Understanding and Supporting Data-driven Sports Storytelling", ACM CHI conference*

2018 Contributor, NSF Award (No. 1816620); *covered by Notre Dame News*[1]

2017 Joseph F. Downes Memorial Award (~$1,500), *DECISIVe workshop, IEEE VIS*

2017 CRA-W Grad Cohort Scholarship (~$1,500), *Washington DC*

PUBLICATIONS

■ Journal article (peer-reviewed) ● Conference and Workshop papers (peer-reviewed)

▲ Poster (peer-reviewed) ◆ Panel, Book chapter, Case study, and Thesis

2021 ■ **An Insight-based Evaluation of a Personal Visualization Interface.**
Talkad Sukumar, P., et al.
(In Preparation)

■ **Lifestyles Matter: The Importance of Latent Diversity in Personal Work Rhythms and Family Life in Remote Teams**
Breideband, T., Sukumar, P.T., Mark, G., Caruso, M., D'Mello, S., and Striegel, A.D.,
CSCW 2021 (Submitted)

2020 ◆ **Designing an Interactive Visualization System for Monitoring Participant Compliance in a Large-scale, Longitudinal Study.**
Talkad Sukumar, P., Breideband, T., Martinez, G., Caruso, M., Rose, S., Steputis, C., D'Mello, S., Mark, G., & Striegel, A.
In Extended Abstracts of the 2021 CHI Conference on Human Factors in Computing Systems (to appear).
[21% Acceptance Rate]

▲ **Visualizing Participatory Inequities in Classroom Data.**
Talkad Sukumar, P., Reinholz, D., Shah, N., & Striegel, A.
IEEE VIS 2020 Electronic Conference Proceedings [Poster].

◆ **Transparency in Qualitative Research: Increasing Fairness in the CHI Review Process.**
Sukumar, P. T., Avellino, I., Remy, C., DeVito, M. A., Dillahunt, T. R., McGrenere, J., & Wilson, M. L
In Extended Abstracts of the 2020 CHI Conference on Human Factors in Computing Systems (pp. 1-6). [28.6% Acceptance Rate].

● **Characterizing Exploratory Behaviors on a Personal Visualization Interface Using Interaction Logs.**
Sukumar, P.T., Martinez, G.J., Grover, T., Mark, G., D'Mello, S.K., Chawla, N.V., Mattingly, S.M. and Striegel, A.D.,
EuroVis 2020 - Short Papers. [45.7% Acceptance Rate]

2019 ● **Mobile Devices in Programming Contexts: A Review of the Design Space and Processes.**
Talkad Sukumar, P., & Metoyer, R.
In Proceedings of the 2019 on Designing Interactive Systems Conference (pp. 1109-1122).
[25% Acceptance Rate]

[1] https://engineering.nd.edu/news-publications/news/201cvisual-debiasing201d-an-approach-to-mitigate-cognitive-bias-in-complex-decision-making

GameViews: Understanding and Supporting Data-driven Sports Storytelling.
Zhi, Q., Lin, S., Talkad Sukumar, P., & Metoyer, R.
In Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems (pp. 1-13).
[23.8% Acceptance Rate, **Best Paper Honorable Mention Award (top 5%)**]

2018 **Replicating User-defined Gestures for Text Editing.**
Talkad Sukumar, P., Liu, A., & Metoyer, R.
In Proceedings of the 2018 ACM International Conference on Interactive Surfaces and Spaces (pp. 97-106).
[26.7% Acceptance Rate]

Making a Pecan Pie: Understanding and Supporting The Holistic Review Process in Admissions.
Talkad Sukumar, P., Metoyer, R., & He, S.
Proceedings of the ACM on Human-Computer Interaction, 2(CSCW), 1-22. [25.6% Acceptance Rate]

Towards Designing Unbiased Replication Studies in Information Visualization.
Sukumar, P. T., & Metoyer, R.
In 2018 IEEE Evaluation and Beyond-Methodological Approaches for Visualization (BELIV) (pp. 93-101).

A Visualization Approach to Addressing Reviewer Bias in Holistic College Admissions.
Sukumar, P. T., & Metoyer, R.
In Cognitive Biases in Visualizations (pp. 161-175). Springer, Cham.

2017 **Holistic Reviews in Admissions: Reviewer Biases and Visualization Strategies to Mitigate Them.**
Sukumar, P. T., Metoyer, R., & He, S.
In DECISIVe: Workshop on Dealing with Cognitive Biases in Visualizations. IEEE VIS.

2012 **Tutorial: implementation of a pedestrian tracker using foot-mounted inertial sensors.**
Fischer, C., Talkad Sukumar, P., & Hazas, M.
IEEE Pervasive Computing, 12(2), 17-27.

2010 **Enhanced Stance Phase Detection and Extended Kalman Filtering for Strapdown Pedestrian Dead Reckoning.**
Talkad Sukumar, P.
Master's Thesis, Lancaster University, UK

SELECTED PROJECTS

2020 - **Visualizing Classroom Participation Data to Promote Equity in Classrooms,** *Univ. of Notre Dame Collaboration with Prof. Daniel Reinholz, SDSU*
• Designed potential solutions, informed by visualization design principles and guidelines, for visualizing classroom participation data disaggregated by race and gender
• The solutions are aimed at making teachers aware of their implicit biases and to enable them to consciously enforce participatory equity in their classrooms
• Currently designing a quantitative empirical study to measure effectiveness of visualizations for tasks specific to understanding equity and identifying inequities in class participation data, e.g., do students belonging to Race A participate as much as those belonging to Race B?

2019 - **Intelligent Facilitation of Teamwork via Longitudinal Sensing in Context,** *Univ. of Notre Dame*
Collaboration with Prof. Gloria Mark, UCI and Prof. Sidney D'Mello, CU Boulder
• This project aims to understand and build models to facilitate *team behavior* by tracking physical characteristics, psychological traits, and other aspects of teams through wearables, Bluetooth beacons, and surveys
• Contributing to all activities pertaining to the ongoing large-scale tracking study including designing the study protocol, recruitment and enrollment of teams, monitoring participant compliance, and analyzing collected data

2019 - **Methods for Studying Personal Data Visualizations,** *Univ. of Notre Dame*
• Implemented an interface presenting visualizations of the personal data gathered in the Tesserae study[2], a large-scale, year-long study where various personal data attributes of 757 information workers were tracked through wearables and Bluetooth beacons
• Explored empirical methods, including think-aloud protocol and analysis of interaction logs, towards obtaining a realistic understanding of personal visualizations through this interface

2018 - **Replication and Research Transparency Initiatives,** *Univ. of Notre Dame*
• Contributed to the CHI conference reviewing guidelines[3], as part of the *Transparent Statistics Group*
• *In collaboration with Dr. Ignacio Avellino (UMBC) and Dr. Christian Remy (Aarhus University),* organized and moderated a virtual panel at CHI 2020 on transparency in qualitative-research CHI submissions

2017 - 2019 **Understanding the Holistic Admissions Process – A Visualization Design Study,** *Univ. of Notre Dame*
• Domain Characterization: Characterized the holistic review process commonly employed in the United States to make undergraduate admissions decisions through contextual interviews and observations
• Data and Task Abstraction: Translated the data and task requirements gathered from domain-specific language into abstractions that a user can address through visualization
• Identified possible leverage points for applying visualization decision-support tools within the holistic review process, including the use of visualization approaches to mitigate potential cognitive biases of the reviewers identified in the study

2016 - 2017 **Programming on Mobile Devices,** *Univ. of Notre Dame*
• Conducted an extensive survey on the timely topic of programming on mobile devices and published a review of the design space and design processes useful to both practitioners and researchers

2010 **Enhanced Stance Phase Detection and Extended Kalman Filtering for Strapdown Pedestrian Dead Reckoning,** *Lancaster University*
Master's Thesis
• Implemented an improved stand-alone pedestrian-tracking system (using shoe-mounted inertial sensors) aimed at addressing the needs of emergency responders
• Evaluated various methods to detect the stationary periods when walking and formulated a Kalman filter for updating the velocity during the detected stationary periods
• Our tracking system yielded significantly better results than the algorithms previously proposed in the literature

[2] https://dl.acm.org/doi/pdf/10.1145/3290607.3299041
[3] https://transparentstatistics.org/2019/08/01/updates-to-chi-submission-and-reviewing-guides/

TEACHING EXPERIENCE

Spring 2016, Spring 2018 — **Human-Computer Interaction (HCI)** — 3 Credits, University of Notre Dame
Instructor: Prof. Ronald Metoyer
• Created HCI course material and media to effectively communicate key concepts as well as evaluate student performance
• Delivered two lectures and conducted a HTML/CSS/JavaScript workshop to help students with their course projects
• Evaluated and assigned grades to (>30) student quizzes and assignments, gave feedback on their project progress and presentations, and held office hours (4 hours per week)
• Received unsolicited student feedback passed on by Prof. Metoyer:
"There's nowhere else to note it, but I'll mention it here. Poorna, our TA, is one of the hardest working and most dependable TAs I've had in my time at Notre Dame."

Fall 2015 — **Data Mining** — 3 Credits, University of Notre Dame
Instructor: Prof. Nitesh Chawla
• Evaluated and assigned grades to (>70) student quizzes, assignments, and midterm
• Clarified course content and provided guidance on solving assignment problems during office hours (4 hours per week)

ORAL PRESENTATIONS

May 2020 — **EuroVis conference** (virtual)
Presented paper *"Characterizing Exploratory Behaviors on a Personal Visualization Interface Using Interaction Logs."*
(Recorded presentation: https://www.youtube.com/watch?reload=9&v=rv90AHiVl9E&feature=youtu.be)

June 2019 — **DIS conference,** San Diego, USA
Presented paper *"Mobile Devices in Programming Contexts: A Review of the Design Space and Processes"*

Nov. 2018 — **ISS conference,** Tokyo, Japan
Presented paper *"Replicating User-defined Gestures for Text Editing"*
(Recorded presentation: https://www.youtube.com/watch?v=Ia9FkoeYYZY)

Nov. 2018 — **CSCW conference,** Jersey City, USA
Presented paper *"Making a Pecan Pie: Understanding and Supporting The Holistic Review Process in Admissions"*

Oct. 2018 — **BELIV Workshop,** IEEE VIS, Berlin, Germany
Presented mini-tutorial *"Towards Designing Unbiased Replication Studies in Information Visualization"*
(Recorded presentation: *https://vimeo.com/305865070*)

Oct. 2017 — **DECISIVe Workshop,** IEEE VIS, Phoenix, Arizona
Presented paper *"Holistic Reviews in Admissions: Reviewer Biases and Visualization Strategies to Mitigate them"*

SERVICE

2019 - 2020 **Graduate Student Union representative** *for the Department of Computer Science and Engineering, University of Notre Dame*

2019 **Session Chair,** *ACM DIS and CHI conferences*

2019 - 2021 **Student Reviewer,** *ACM CSCW and CHI conferences*

PROFESSIONAL AFFILIATIONS

ACM student member

Upsilon Pi Epsilon (UPE), Computing Honor society (Notre Dame chapter)

Graduate Society of Women Engineers (Notre Dame chapter)