

# Curriculum Vitae of Poorna Talkad Sukumar

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EDUCATION	<b>University of Notre Dame</b>	South Bend, IN
	PhD in Department of Computer Science and Engineering Research Advisor: Dr. Aaron Striegel (co-advised by Dr. Ronald Metoyer) GPA: 4.0	May 2021 (expected)
	<b>Lancaster University</b>	United Kingdom
	MSc in Mobile and Ubiquitous Computing Thesis Supervisor: Dr. Mike Hazas	September 2010
	<b>Dayananda Sagar College of Engineering,</b>	Bangalore, India
	B.E. in Computer Science and Engineering	July 2008

RESEARCH EXPERIENCE	<b>University of Notre Dame</b>	South Bend, IN
	<i>Graduate Research Assistant, Department of Computer Science and Engineering</i>	
	<i>A Human-Centered Approach for Identifying Potential Cognitive Biases in Decision-Making Domains and Designing Visualization Techniques for Their Mitigation</i>	Fall 2016—Present
	<ul style="list-style-type: none"><li>✦ Rigorously characterized the holistic review process commonly employed in the United States to make undergraduate admissions decisions using contextual interviews and observations achieving both transparency and identifying opportunities for technological interventions to support the process</li><li>✦ Illuminated the possibility of reviewers being susceptible to cognitive biases in the process based on theoretical research, identified potential reviewer biases, and proposed (generalizable) visualization-based strategies for their mitigation</li></ul>	
	<i>Replication and Research Transparency Initiatives</i>	Summer 2018—Present
	<ul style="list-style-type: none"><li>✦ Extensively searched and reviewed papers containing replication studies in information visualization from an <i>experimenter-bias</i> perspective and generated guidelines for designing unbiased replications</li><li>✦ Approached the generative topic of replication in qualitative research by redefining and situating replication in the context of qualitative research and emphasizing its utility along with the importance of making qualitative research more transparent</li><li>✦ Joined the Transparent Statistics group <sup>1</sup> and contributed to the CHI 2020 reviewing guidelines <sup>2</sup> for reviewing papers with qualitative research contributions</li></ul>	
	<i>Stylus-based Gestures for Text Editing on Tablet Devices</i>	Fall 2016—Spring 2017
	<ul style="list-style-type: none"><li>✦ Generated a <i>guessable</i>, stylus-based, user-defined gesture set by replicating studies from the 1980's to elicit hand-drawn gestures from users for text-editing tasks on tablet devices</li></ul>	
	<i>Programming on Mobile Devices</i>	Spring 2016—Spring 2017
	<ul style="list-style-type: none"><li>✦ Conducted an extensive survey on the timely topic of programming on mobile devices and presented a review of the design space and design processes useful to both practitioners and researchers</li></ul>	

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<sup>1</sup><https://transparentstatistics.org/>

<sup>2</sup><https://chi2020.acm.org/authors/papers/guide-to-a-successful-submission/>

*Portable Human Gait-Analysis System*

July 2013—July 2015

- ✦ Developed a low-cost system to perform *gait analysis* (used in the treatment of post-stroke patients and patients with cerebral palsy) using multiple inertial sensors whose performance was comparable to that of a highly-expensive, proprietary optical gait-analysis system

*Hindi/Devanagari Text Entry Using Chording Input*

Feb 2012—December 2013

- ✦ Implemented a bi-manual typing interface for Hindi/Devanagari text entry based on *chording* input (which affords  $2^n-1$  touch combinations for  $n$  fingers) resulting in the assignment of unique combinations to the  $\sim 122$  Unicode characters of the script

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**Lancaster University**

United Kingdom

*Master's student and Research Intern, Computing Department*

*Thesis: Enhanced Stance Phase Detection and Extended Kalman Filtering for Strapdown Pedestrian Dead Reckoning*

May 2010—Jan 2011

- ✦ 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*

*Heuristic Evaluation of a Situated Door Display*

Dec 2009

- ✦ Performed a *heuristic evaluation* of a situated interactive office door-display, “Hermes2”, and uncovered numerous usability problems with the display
- ✦ Introspected the usefulness of the heuristics themselves, such as if they can be used to uncover all the usability problems, and found that the heuristics are typically sufficiently generic to cover most aspects and interpreted with specific tasks in mind

PROFESSIONAL  
EXPERIENCE

**Matter 2 Media**  
*Software Developer*

Bristol, United Kingdom  
March 2011—July 2011

- ✦ Successfully developed prototypes for touch-based applications where touch technologies, such as NFC/RFID and QR codes, are associated with physical objects. On “touching” these objects embedded in the real world, the applications delivered location-specific content and experiences to users

TEACHING  
EXPERIENCE

**University of Notre Dame**  
*Teaching Assistant, Department of Computer Science and Engineering*

IN, USA

*Human-Computer Interaction (HCI) - 3 Credits*  
Instructor: Dr. Ronald Metoyer

Spring 2016 and Spring 2018

- ✦ 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 projects
- ✦ Evaluated and assigned grades to student ( $>30$ ) 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 Dr. 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.”

*Data Mining - 3 Credits*

Fall 2015

Instructor: Dr. Nitesh Chawla

- ✦ Evaluated and assigned grades to student (>70) quizzes, assignments, and midterm
- ✦ Clarified course content and provided guidance on solving assignment problems during office hours (4 hours per week)

## SELECTED PUBLICATIONS

### Peer-reviewed Journal Articles

1. **P. Talkad Sukumar**, R. Metoyer, and S. He, “Making a Pecan Pie: Understanding and Supporting The Holistic Review Process in Admissions,” *Proceedings of the ACM on Human-Computer Interaction*, vol. 2, no. CSCW, p. 169, 2018. (Acceptance Rate: 25.6%)
2. Carl Fischer, **Poorna Talkad Sukumar**, and Mike Hazas. “Tutorial: Implementing a pedestrian tracker using inertial sensors.” *IEEE pervasive computing* 12.2 (2013):17-27.

### Book Chapters

1. **Poorna Talkad Sukumar** and Ronald Metoyer. “A Visualization Approach to Addressing Reviewer Bias in Holistic College Admissions.” *Cognitive Biases in Visualizations*. Springer, Cham, 2018. 161-175. (2018)

### Peer-reviewed Conference and Workshop Articles

1. **Poorna Talkad Sukumar** and Ronald Metoyer. (2019, June). “Mobile Devices in Programming Contexts: A Review of the Design Space and Processes.” *In Proceedings of the 2019 on Designing Interactive Systems Conference* (pp. 1109-1122). ACM. (Acceptance Rate: 25%)
2. Qiyu Zhi, Suwen Lin, **Poorna Talkad Sukumar**, and Ronald Metoyer. “GameViews: Understanding and Supporting Data-driven Sports Storytelling.” *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*. ACM, 2019 (Acceptance Rate: 23.8%)
3. **Poorna Talkad Sukumar**, Anqing Liu, and Ronald Metoyer. “Replicating User-defined Gestures for Text Editing.” *Proceedings of the 2018 ACM International Conference on Interactive Surfaces and Spaces*. ACM, 2018. (Acceptance Rate: 26.7%)
4. **Poorna Talkad Sukumar** and Ronald Metoyer. “Towards Designing Unbiased Replication Studies in Information Visualization.” *IEEE Evaluation and Beyond Methodological Approaches for Visualization (BELIV)*. IEEE, 2018.
5. **Poorna Talkad Sukumar**, Ronald Metoyer, and Shuai He. “Holistic Reviews in Admissions: Reviewer Biases and Visualization Strategies to Mitigate them.” *DECISIVE Workshop*, IEEE VIS (2017)

### Preprints/Under Review

1. **Poorna Talkad Sukumar** and Ronald Metoyer. “Replication and Transparency of Qualitative Research from a Constructivist Perspective”
2. **Poorna Talkad Sukumar** and Ronald Metoyer. “Factoring in Expert Intuitions in Visualization Design and Evaluation”

### Thesis

1. **Poorna Talkad Sukumar**. “Enhanced Stance Phase Detection and Extended Kalman Filtering for Strapdown Pedestrian Dead Reckoning.” *Masters Thesis*, Lancaster University (2010)

SELECTED ORAL PRESENTATIONS	<p><b>DIS conference</b>, San Diego, USA <span style="float: right;">June 2019</span> Presented paper “<i>Mobile Devices in Programming Contexts: A Review of the Design Space and Processes</i>”</p> <p><b>ISS conference</b>, Tokyo, Japan <span style="float: right;">Nov 2018</span> Presented paper “<i>Replicating User-defined Gestures for Text Editing</i>” (Recorded presentation: <a href="https://www.youtube.com/watch?v=Ia9FkoeYYZY">https://www.youtube.com/watch?v=Ia9FkoeYYZY</a>)</p> <p><b>CSCW conference</b>, Jersey City, USA <span style="float: right;">Nov 2018</span> Presented paper “<i>Making a Pecan Pie: Understanding and Supporting The Holistic Review Process in Admissions</i>”</p> <p><b>BELIV Workshop</b>, IEEE VIS, Berlin, Germany <span style="float: right;">Oct 2018</span> Presented mini-tutorial “<i>Towards Designing Unbiased Replication Studies in Information Visualization</i>” (Recorded presentation: <a href="https://vimeo.com/305865070">https://vimeo.com/305865070</a>)</p> <p><b>DECISIVE Workshop</b>, IEEE VIS, Phoenix, Arizona <span style="float: right;">Oct 2017</span> Presented paper “<i>Holistic Reviews in Admissions: Reviewer Biases and Visualization Strategies to Mitigate them</i>”</p>
ACADEMIC SERVICE	<ul style="list-style-type: none"> <li>• Graduate Student Union representative for the Department of Computer Science and Engineering, University of Notre Dame 2019–2020</li> <li>• Chaired the “Data” session at the ACM DIS conference in San Diego in June 2019</li> <li>• Chaired the “Decision Making” session at the ACM CHI conference in Glasgow in May 2019</li> <li>• Student Reviewer for Pervasive Computing, ACM CHI and ACM CSCW conferences</li> </ul>
AWARDS AND RECOGNITIONS	<ul style="list-style-type: none"> <li>• Outstanding Graduate TA Award, Department of Computer Science and Engineering, University of Notre Dame, Spring 2019</li> <li>• Special Recognition for Outstanding Reviews, CSCW’19 papers</li> <li>• Honorable Mention Award, “<i>Game Views: Understanding and Supporting Data-driven Sports Storytelling</i>”, ACM CHI conference, May 2019</li> <li>• Contributor, NSF Award (No. 1816620); covered by Notre Dame News<sup>3</sup></li> <li>• Joseph F. Downes Memorial Award (~\$1,500), DECISIVE workshop, Oct 2017</li> <li>• CRA-W Grad Cohort Scholarship (~\$1,500), Washington DC, April 2017</li> </ul>
PROFESSIONAL AFFILIATIONS	<ul style="list-style-type: none"> <li>• ACM student member</li> <li>• Upsilon Pi Epsilon (UPE), Computing Honor society (Notre Dame chapter)</li> <li>• Graduate Society of Women Engineers (Notre Dame chapter)</li> </ul>
PROGRAMMING SKILLS	MATLAB, R, C, C++, Java, HTML, JavaScript, D3.js

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<sup>3</sup><https://engineering.nd.edu/news-publications/pressreleases/201cvisual-debiasing201d-an-approach-to-mitigate-cognitive-bias-in-complex-decision-making>