

# CATHERINE “CATIE” BAKER

*CLARE BOOTHE LUCE ASSISTANT PROFESSOR IN COMPUTER SCIENCE*

*DEPARTMENT OF COMPUTER SCIENCE, DESIGN & JOURNALISM*

*COLLEGE OF ARTS & SCIENCES*

*CREIGHTON UNIVERSITY*

---

## CONTACT

Phone: 402-280-5705

Office: Hitchcock 203D

Email: [catherinebaker@creighton.edu](mailto:catherinebaker@creighton.edu)

Website: [catiebaker.com](http://catiebaker.com)

## EDUCATION

Ph.D. **University of Washington**, Seattle, Washington

Computer Science & Engineering

August 2017

Cumulative GPA: 3.91/4.0

Dissertation: Understanding and Improving Blind Students' Access to Visual Information in Computer Science Education

Masters **University of Washington**, Seattle, Washington

Computer Science & Engineering

December 2014

Cumulative GPA: 3.87/4.0

Bachelors **DePauw University**, Greencastle, Indiana

May 2012

Summa Cum Laude, Science Research Fellows Honor Program

Cumulative GPA: 3.97/4.0;

Computer Science GPA: 4.0/4.0, Mathematics GPA: 3.92/4.0

## AREAS OF RESEARCH

Accessibility, Computer Science Education, Human Computer Interaction

## PROFESSIONAL EXPERIENCE

- Creighton University – Assistant Professor (Fall 2017-Present)
  - Clare Boothe Luce Chair for Women in Science
- University of Washington - Research Assistant (Fall 2016-Spring 2017)
  - Human Centered Design & Engineering Outreach Research Assistant

- Organized and led HCDEs local outreach efforts
- Helped design and lead HCDEs first Alternative Spring Break
- Microsoft – Accessibility Intern (Summer 2016)
  - Worked with teams on improving accessibility of their products
  - Provided guides for integrating accessibility into current process
- University of Washington – Research Assistant (Fall 2012-Summer 2013)
  - Research on project on using mobile phones to increase accessibility for people who are blind
- National Institute of Standards & Technology – SURF Program (Summer 2011, 2012)
  - Summer research project on graph toughness
  - Summer research project on the optimization of circuit design

## RESEARCH & SCHOLARSHIP

*In the field of computer science, conference publications are frequently equally or more prestigious than journal publications and therefore have rigorous peer review processes that typically mirror those of journals, just without the Revise and Resubmit option for some conferences.*

*The authorship order has two primary conventions. The first is that authorship is ordered in terms of the amount of work done by each author, with the author who has done the most work placed first in the authorship order. The exception of this is papers with combinations of students and faculty. In general, the students who carried out the work are listed first and the faculty advisors are after the students, even if they have done more work than some of the students. Within the order of the faculty advisors, the primary advisor is typically in the last author position*

### PEER REVIEWED PUBLICATIONS

#### Journal Articles

1. Shiri Azenkot, Margot J. Hanley and **Catherine M. Baker**. 2021. How Accessibility Practitioners Promote the Creation of Accessible Products in Large Companies. In *Proceedings of the ACM on Human-Computer Interaction*, Vol. 5, CSCW1, Article 148 (April 2021), 27 pages, <https://doi.org/10.1145/3449222>  
*Google Scholar Citations: 2, ACM Digital Library Downloads: 126*
2. Aimee Schwab-McCoy, **Catherine M. Baker** & Rebecca E. Gasper (2020) Data Science in 2020: Computing, Curricula, and Challenges for the Next 10 Years, *Journal of Statistics Education*, DOI: [10.1080/10691898.2020.1851159](https://doi.org/10.1080/10691898.2020.1851159)  
*Google Scholar Citations: 7, Views: 5371, Altmetric: 20*
3. **Catherine M. Baker**, Lauren R. Milne, Ryan Drapeau, Jeffrey Scofield, Cynthia L. Bennett, and Richard E. Tactile Graphics with a Voice. *ACM Transactions on Accessible Computing (TACCESS)* 8, 1, Article 3 (January 2016), 22 pages. <https://doi.org/10.1145/2854005>  
*Google Scholar Citations: 27, ACM Digital Library Downloads: 394*

#### Conference Papers

*In the field of computer science, conference publications are frequently equally or more prestigious than journal publications and tend to have better exposure as they also include a presentation that will*

accompany the publication. For instance, in looking at the publication rankings for the Human Computer Interaction subfield based on Google Scholar (which uses the h5 index), the top venue is a conference (CHI), not journal. As such, conferences have rigorous peer review processes that typically mirror those of journals, just without the Revise and Resubmit option for some conferences.

1. **Catherine M. Baker**, Yasmine Elglaly, and Kristen Shinohara. 2020. A Systematic Analysis of Accessibility in Computing Education Research. In Proceedings of ACM Technical Symposium on Computer Science Education (SIGCSE '20). ACM, New York, NY, USA, 7 pages.  
<https://doi.org/10.1145/3328778.3366843>  
*Acceptance Rate: 31.4%*  
*Google Scholar Citations: 19, ACM Digital Library Downloads: 389*
2. **Catherine M. Baker**, Lauren R. Milne, and Richard E. Ladner. 2019. Understanding the Impact of TVIs on Technology Use and Selection by Children with Visual Impairments. In *2019 CHI Conference on Human Factors in Computing Systems Proceedings (CHI 2019), May 4–9, 2019, Glasgow, Scotland, UK*. ACM, New York, NY, USA. 13 pages.  
<https://doi.org/10.1145/3290605.3300654>  
*Acceptance Rate: 23.8%*  
*Google Scholar Citations: 11, ACM Digital Library Downloads: 530*
3. **Catherine M. Baker**, Cynthia L. Bennett, Richard E. Ladner. 2019. Educational Experiences of Blind Programmers. In *Proceedings of 50<sup>th</sup> ACM Technical Symposium on Computer Science Education (SIGCSE '19), February 27-Mar. 2, 2019, Minneapolis, MN, USA*. ACM, NY, NY, USA. 7 pages. <https://doi.org/10.1145/3287324.3287410>  
*Acceptance Rate: 32%*  
*Google Scholar Citations: 12, ACM Digital Library Downloads: 580*
4. **Catherine M. Baker**, Lauren R. Milne, and Richard E. Ladner. 2015. StructJumper: A Tool to Help Blind Programmers Navigate and Understand the Structure of Code. In *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems (CHI '15)*. ACM, New York, NY, USA, 3043-3052. <https://doi.org/10.1145/2702123.2702589>  
*Acceptance Rate: 25%*  
*Google Scholar Citations: 64, ACM Digital Library Downloads: 651*
5. **Catherine M. Baker**, Lauren R. Milne, Jeffrey Scofield, Cynthia L. Bennett, and Richard E. Ladner. 2014. Tactile graphics with a voice: using QR codes to access text in tactile graphics. In *Proceedings of the 16th international ACM SIGACCESS conference on Computers & accessibility (ASSETS '14)*. ACM, New York, NY, USA, 75-82.  
<https://doi.org/10.1145/2661334.2661366>  
**\*BEST STUDENT PAPER\***  
*Acceptance Rate: 26%*  
*Citations: 45, ACM Digital Library Downloads: 566*

### **Late Breaking Works, Posters, and Demos With Short Archival Papers:**

*Most computer science conferences offer a venue for publishing a smaller paper in conjunction with a poster or demonstration. These papers range from 2-10 pages and are used for work that is either a smaller contribution than what is expected for a full paper, is still a work in progress, or the research*

community would benefit from a demonstration of the work. These papers have a less rigorous review process than journal and conference papers, though they are still peer reviewed.

1. Lilu Martin, Catherine M. Baker, Kristen Shinohara, and Yasmine Elglaly. 2022. The Landscape of Accessibility Skill Set in the Software Industry Positions. Accepted and to appear in ASSETS 2022 – October 2022
2. Lin Jia, Yasmine N. Elglaly, **Catherine M. Baker**, and Kristen Shinohara. 2021. Infusing Accessibility into Programming Courses. In *CHI Conference on Human Factors in Computing Systems Extended Abstracts (CHI '21 Extended Abstracts), May 8-13, 2021, Yokohoma, Japan*. ACM, New York, NY, USA, 6 pages. <https://doi.org/10.1145/3411763.3451625>  
*Google Scholar Citations: 4, ACM Digital Library Downloads: 134*
3. Rohan Patel, Pedro Breton, **Catherine M. Baker**, Yasmine N. Elglaly, and Kristen Shinohara. 2020. Why Software is Not Accessible: Technology Professionals' Perspectives and Challenges. In *Extended Abstracts of the 2020 CHI Conference on Human Factors in Computing Systems (CHI EA '20)*. ACM, New York, NY, USA 1-9. <https://doi.org/10.1145/3334480.3383103>  
*Google Scholar Citations: 25, ACM Digital Library Downloads: 341*
4. Lauren R. Milne, **Catherine M. Baker**, and Richard E. Ladner. 2017. Blocks4All Demonstration: a Blocks-Based Programming Environment for Blind Children. In *Proceedings of the 19th International ACM SIGACCESS Conference on Computers and Accessibility (ASSETS '17)*. ACM, New York, NY, USA, 313-314. <https://doi.org/10.1145/3132525.3134774>  
*Google Scholar Citations: 10, ACM Digital Library Downloads: 247*
5. **Catherine M. Baker**, Lauren R. Milne, Jeffrey Scofield, Cynthia L. Bennett, and Richard E. Ladner. 2014. Tactile graphics with a voice demonstration. In *Proceedings of the 16th international ACM SIGACCESS conference on Computers & accessibility (ASSETS '14)*. ACM, New York, NY, USA, 321-322. <https://doi.org/10.1145/2661334.2661349>  
*Google Scholar Citations: 3, ACM Digital Library Downloads: 175*

### Newsletter Publications

1. **Catherine M. Baker**. 2017. Increasing access to computer science for blind students. *SIGACCESS Access. Comput.*, 117 (January 2017), 19–22. DOI: <https://doi.org/10.1145/3051519.3051523>  
*Google Scholar Citations: 5, ACM Digital Library Downloads: 215*

### BOOK CHAPTERS

1. **Catherine M. Baker**, Yasmine Elglaly, and Kristen Shinohara. "Integrating Accessibility into Data Structures Courses." In *Teaching Accessible Computing*. In preparation – draft due Feb 2023, expected publication spring 2023

### POSTER PRESENTATIONS WITHOUT ARCHIVAL PAPERS

1. Catherine M. Baker, Yasmine Elglaly, and Kristen Shinohara. 2022. Helping Computer Science Students Learn How to Build Accessible Computing Technologies. AAAS IUSe Summit

## PATENTS

1. Jessica Julie Tran, Patrick Thomas Gaule, John Richard Porter, III, **Catherine Marie Baker**, Dillon Taylor Baker, Harrison Tu. US20180214779A1, “Refreshable braille display accessory for a game controller” <https://patents.google.com/patent/US20180214779A1/>
  - a. Patent Granted: 11/5/2019
2. Jessica Julie Tran, Patrick Thomas Gaule, John Richard Porter, III, Dillon Taylor Baker, **Catherine Marie Baker**, Harrison Tu. US20180214779A1, “Braille chording accessory for a game controller” <https://patents.google.com/patent/US20180214780A1/>
  - a. Patent Granted: 8/20/2019

## OTHER SCHOLARLY WORKS

1. **Catie Baker**, et al. White Paper: Accessible Computing Education in Colleges and Universities
  - a. [https://www.microsoft.com/en-us/research/uploads/prod/2021/01/Accessible-CS-Education-in-Colleges-and-Universities\\_Making-K12-Ed-Accessible.pdf](https://www.microsoft.com/en-us/research/uploads/prod/2021/01/Accessible-CS-Education-in-Colleges-and-Universities_Making-K12-Ed-Accessible.pdf)
2. Including Accessibility in Computer Science
  - a. <https://accessibilityeducation.github.io/>

## GRANT APPLICATIONS

1. Helping Computer Science Students Learn How to Build Accessible Computing Technologies. PI: Catherine Baker. National Science Foundation, \$56,714.00 (\$299,985 total across the three institutions), 10/01/2021-9/30/2024
  - a. Status: Funded. Award Number: 2121428
2. HDR I-DIRSE-FW: MAPPING Data Science: Establishing an Institute for Meaningful Assessment Practices in Data Science PI: Aimee Schwab-McCoy, Co-PI: **Catherine M. Baker**, Rebecca Gasper. National Science Foundation, \$434,917, January 2020 - December 2021.
  - a. Status: Declined. (Reviews: Good-Good-Fair-Poor)

## STUDENT RESEARCH PROJECTS

1. Implementation of the NASA F' Software in Rust: Eli Blaney ('22) – Fall 2021-Spring 2022
  - This project implemented the NASA F' Software in a recently developed programming language, Rust, which has memory safety benefits to understand how the implementation would change and what potential benefits there were.
  - This was a student-initiated project which received one of the NASA Nebraska Space Grants
2. Data Science Program Analysis: Kristen Holmes ('22) – Spring 2020-Spring 2021
  - Identified program with undergraduate data science programs and analyzed their requirements to understand the differences in their approaches.
3. Accessibility of WYSIWYG Web Editors: Kate Kearney ('20), Vi Conrad ('23), Anna Preston ('25), Keely Lopez (HS Student through Haddix STEM Program) – Spring 2019-current
  - Evaluated WYSIWYG web editors (e.g. Wix, Weebly) to understand how their design affects the creation of accessible websites.
4. Accessibility Knowledge of Technology Professionals. Virgilio Rodriguez ('20), Parker Johnson ('19) – Summer 2018
  - Designed a survey to gain an understanding of technology professionals' knowledge of accessibility. The project was continued by students at RIT.

5. MAVI: Math Accessibility for the Visually Impaired. Cameron Nielsen ('20), Maggie Gard ('20), Jessie Szynskie (HS Student through Haddix STEM Program) – Summer 2018-Spring 2019
  - Developed a mobile app to allow navigation of complex mathematical equations to increase their accessibility to visually impaired students

## INVITED TALKS & PANELS

- Picture a Scientist Panel – Opportunity Corp, UNeTech Institute & Bio Nebraska, July 2022
- Women in STEM Panel - Young Diverse Women in the Medical Sciences, Creighton University, November 2021
- Production of Accessible Materials – TeachAccess, February 2020
- Accessibility for Blind Programmers – Technology Transformation Services (US Government), February 2020
- Increasing Access to Computer Science for Blind Students – University of Iowa, Department of Computer Science Colloquia, October 2018
- Career Paths in STEM Panel – Haddix STEM Corridor Workshop, Creighton University, June 2018
- New Faculty Panel – Preparing Future Faculty Seminar, University of Nebraska, Lincoln, May 2018
- Increasing Access to Computer Science for Blind Students – Creighton University Physics Seminar, March 2018
- Accessibility for Blind Students in STEM – Creighton Computer Science Club, September 2017
- Educational Experiences of Blind Programmers – Google Accessibility Week, October 2016
- Increasing Access to STEM for Blind Students – Grinnell College, May 2016
- Women in STEM Panel at Big Dream Showing – Edmonds Community College, April 2016
- Tactile Graphics with a Voice – Pacific Northwest AER Conference, December 2014
- Projects in Mobile Accessibility – Summer Academy for Advancing Deaf and Hard of Hearing in Computing, August 2013

## ACADEMIC HONORS & HONOR SOCIETIES

- ASSETS Doctoral Consortium (2016)
- Grace Hopper Conference Scholarship (2016)
- New Educators Workshop Travel Grant (2016)
- Best Student Paper – ASSETS 2014
- National Science Foundation Graduate Research Fellowship (2012)
- UW Department of Computer Science Fellowship Recipient (2012)
- NCAA Postgraduate Fellowship Recipient (2012)
- Robert J. Thomas Outstanding Senior for the Computer Science Department (2012)
- Barry M. Goldwater Scholarship (2011)
- Phi Beta Kappa Honor Society Initiate (2011)
- Computer Science Department's Wylie Condit Science Scholarship Recipient (2011)
- Inaugural Member of the DePauw University Computer Science Honor Society (2011)
- Mortar Board Member (2011)
- Member of Chi Alpha Sigma (2011)

## TEACHING EXPERIENCE

## CREIGHTON UNIVERSITY

As the Clare Boothe Luce Chair, I have a one course reduction for each academic year.

- Spring 2022
  - CSC 421 – Algorithm Design & Analysis
  - CSC 221 – Intro to Programming
  - IDC 491 – Women in Science
- Fall 2021
  - CSC 321 – Data Structures
  - CSC 444 – Human Computer Interaction
- Spring 2021
  - Pre-tenure Course Reduction*
  - CSC 421 – Algorithm Design & Analysis
  - IDC 491 – Women in Science
  - RSP 101 – Culture of Collegiate Life
- Fall 2020
  - CSC 321 – Data Structures
  - CSC 222 – Object Oriented Programming
  - RSP 101 – Culture of Collegiate Life
- Spring 2020
  - CSC 221 – Intro to Programming
  - CSC 421 – Algorithm Design & Analysis
  - IDC 491 – Women in Science
- Fall 2019
  - CSC 221 – Intro to Programming
  - CSC 321 – Data Structures
- Spring 2019
  - CSC 221 – Intro to Programming
  - CSC 222 – Object Oriented Programming
  - IDC 491 – Women in Science
- Fall 2018
  - CSC 222 – Object Oriented Programming
  - CSC 444 – Human Computer Interaction
- Spring 2018
  - CSC 222 – Object Oriented Programming
  - IDC 491 – Women in Science
- Fall 2017
  - CSC 121 – Computers and Scientific Thinking
  - CSC 221 – Intro to Programming

## UNIVERSITY OF WASHINGTON

- Teaching Assistant for CSE 440 – Human Computer Interaction (Spring 2016)
- Tutor for CSE 143 – Computer Programming II (Fall 2015)
- Instructor for CSE 373 – Data Structures and Algorithm (Spring 2015)
- Tutor for CSE 332 – Data Abstractions (Winter 2015)
- Teaching Assistant for CSE 333 – Systems Programming (Summer 2014, Summer 2015)

## DEPAUW UNIVERSITY

- Computer Science 121 Lab & Project Tutor (2009-2012)
- Computer Science 121 Teaching Assistant

## CURRICULUM DEVELOPMENT

- Data Science Major
- Computer Science Major Revisions
- Human Computer Interaction Understanding Social Science Magis Core Designation
- Data Science Capstone Magis Core Designations for Ethics, Oral Communication and Written Communication

## WORKSHOPS

### ORGANIZED

- Including Accessibility In Computer Science Education – October 2022

### BY INVITATION OR APPLICATION

- Microsoft Research (MSR) Accessible Computer Science Education Workshop – November 2020
- Microsoft Research (MSR) Inclusive Data Visualization Workshop – January 2020

### PROFESSIONAL DEVELOPMENT

- SIGCSE Pre-Conference Event – Integrating Accessibility and Disability into the Computing Curriculum
  - I presented with Dr. Elglaly on the assignments we had developed for integrating accessibility in core computer science courses
- SIGCSE Workshop – Advancing Your Arduino Game: Early and Engaging Scaffolding for Advanced CS – Spring 2022
- SIGCSE Workshop – Grading for Equity – Spring 2021
- SIGCSE Pre-Conference Event – What to Teach About Accessibility
- SIGCSE Workshop – Narratives and Evaluation: How to Write Competitive NSF CS Education Proposals – Spring 2019
- New Advisor Training - Fall 2018
- New Computer Science Faculty Workshop – Summer 2018
- SIGCSE Workshop – Successfully Engaging Early Undergraduates in CS Research - Spring 2018
- Newcomer's Orientation Valuing Ignatian and Creighton Engagement (NOVICE) program - Fall 2017-Spring 2018

## PROFESSIONAL MEMBERSHIPS

- AccessComputing
- Association for Computing Machinery (ACM)
- Phi Beta Kappa



## PROFESSIONAL SERVICE

### *ORGANIZING COMMITTEE MEMBER*

- ACM ASSETS – Education Outreach Chair – 2022

### *PROGRAM COMMITTEE MEMBER*

- ACM ASSETS – 2019, 2020, 2021, 2022

### *REVIEWING*

- TACCESS – 2020, 2021
- CHI (Papers and Notes) – 2014, 2015, 2016, 2017, 2018, 2020, 2021, 2022
- CSCW – 2020
- UIST - 2022
- International Journal of Human-Computer Studies - 2018
- Interacting with Computers – 2017
- CHI (Late Breaking Work) – 2016
- NSF Panel Reviewer – 2018
- Mid-Point Pre-Tenure Peer Review Letter - 2020

### *SESSION CHAIR*

- ACM ASSETS - 2021

## UNIVERSITY SERVICE

### *CREIGHTON UNIVERSITY*

- Clare Boothe Luce Chair for Women in Science – Fall 2017 – present
  - Organized a Women in Science Panel – Spring 2018, 2019, 2022
  - Chair of the CBL Scholarship Committee
- Faculty Senate Member – Fall 2021 - present
- Assessment Day Designated Technology Rubric Revision Committee - 2020
- RSP Instructor – Fall 2020-Spring 2021
- Schedule Builder for Summer Preview – Summer 2021, 2022

### *CREIGHTON UNIVERSITY – DEPARTMENT OF COMPUTER SCIENCE, DESIGN & JOURNALISM*

- Led Development of Department Exit Survey
- Major Advising
  - Served as the major advisor for 17 students majoring in Computer Science or Data Science
- Grace Hopper Closing Keynotes Viewing Party - Fall 2018
- Department Recruiting Events - Fall 2018 - Present
  - Events such as Jay Days, CURAS Research Fair, Major & Minor Fair, and meetings with prospective students
- Computer Science Faculty/Post-Doc Search Committee – Spring 2018, Spring 2020, Spring 2022

## UNIVERSITY OF WASHINGTON

- Non-standard Visit Days Coordinator – Fall 2015-Winter 2016
- HCI Visit Days Coordinator – Spring 2015
- Mentoring Coordinator – Fall 2015 – Spring 2016
- Grad Student Seminar Coordinator – Fall 2015
- Mentor – Fall 2014 – Spring 2015
- TGIF Coordinator – Fall 2013 – Spring 2014
- New Grad Orientation Leader – Fall 2013

## DEPAUW UNIVERSITY

- Association of Computing Machinery Committee on Women DePauw Chapter Chair – Fall 2011 - Spring 2012
- STARS – Fall 2011 – Spring 2012
- Women's Swim Team Captain – Fall 2011-Spring 2012
- Chapter President for Delta Gamma – Spring 2010 – Fall 2011

## COMMUNITY SERVICE

- Communications Director, LPGA Amateur Golf Association Omaha Chapter 2021 – present
- Junior League of Omaha – Fall 2018 – present
  - New Member Core Group Leader – Summer 2022 – Spring 2023
  - Diversity and Inclusion Chair – Summer 2021 – Spring 2022
  - Diversity and Inclusion Vice Chair – Summer 2020 – Spring 2021
  - Diversity and Inclusion Committee – Summer 2019 – Spring 2020
- Research Team, Project18 – Fall 2017 – Fall 2018
- Board Member, Omaha Delta Gamma Alumnae Chapter, Fall 2017- present
- VP Finance, Seattle Area Delta Gamma Alumnae – Summer 2015 – Summer 2016
- VP Lectureship, Seattle Area Delta Gamma Alumnae – Summer 2014 – Summer 2015
- Empowering Blind Students in Science & Engineering (EBSSE) Volunteer – Spring 2014
- Saturday Computing Experience for Deaf & Hard of Hearing HS Students, UW CSE – Spring 2013