

# Darren Guinness

ACCESSIBILITY RESEARCHER

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## Research Experience

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### Research Assistant

UNIVERSITY OF COLORADO BOULDER

*Boulder, U.S.A*

*2015-Present*

- Initiated research which focuses on the use of robot toys as haptic interfaces to communicate information non-visually.
- Designed new interactive displays and toolkits which connect consumer robots with existing applications and online media.
- Coordinated and conducted multi-site user studies with blind stakeholders.
- Engaged in recruitment and mentoring within the newly formed Superhuman Computing Lab.

### Research Intern

ERICSSON RESEARCH

*Santa Clara, U.S.A.*

*Summer 2018*

- Designed local and remote crowd-sourced experiments examining spatial audio integrity and perceived localization.
- Implemented a client-server web system which allowed users to perform experiments remotely in a small team.
- Deployed experiments on an online crowd-sourcing platform.

### Research Intern

MICROSOFT RESEARCH

*Redmond, U.S.A.*

*Summer 2017*

- Designed a new pipeline to supply text captions for images in a web page to a screen-reader user using a web crawler and existing search APIs.
- Created a web server which finds and serves existing captions available on the web to the user's browser via a custom extension.
- Developed an automated system to crawl, cache, and analyze accessibility metadata coverage on the most popular websites.
- Designed initial surveys to assess caption quality and preference with sighted and blind participants.
- This system went on to become the [Caption Crawler](#) product which is currently in Beta.

### Research Assistant

BAYLOR UNIVERSITY

*Waco, U.S.A.*

*2013 - 2015*

- Initiated research in mid-air gestural interaction as an assistive technology.
- Implemented different approaches for gestural cursor control for people with decreased mobility or pain related impairments.
- Engaged in recruitment and mentoring within the newly formed HCI Research Group.

## Work Experience

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### Technology Support Specialist

BOWLING GREEN STATE UNIVERSITY

*Bowling Green, U.S.A.*

*2009-2013*

- Designed, developed, and maintained modules across two content management systems used by the university.
- Met with direct users and stakeholders to scope out and define project goals and requirements.
- Implemented modules including staff evaluations, room reservations, real-time inventory of campus hardware, IT ticketing & scheduling, and more.
- Trained junior student developers in their transition to lead developer.

## Skills

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- Prototyping** Node.js, C#, Python, PHP, Java, C++, Android, OpenCV, OpenGL, R, Matlab, HTML, CSS, SQL, Laser Cutting, Browser Extensions
- Frameworks** Azure Cloud Services, Bootstrap, Express, React, WebSockets, Cylon.js
- Accessibility** Tactile Media Production, Screen Reading Technologies, Spatial Audio, GUI Automation, Accessible Captioning, Blind Guidance
- Methods** Interviews, Lab Study Design, Survey Design, Statistical Analysis, Repeated Measures Design, Crowdsourcing

## Education

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### University of Colorado

PH.D. IN COMPUTER SCIENCE - ADVISED BY SHAUN KANE

*Boulder, CO*

*(exp) May 2021*

### Baylor University

M.S. IN COMPUTER SCIENCE - ADVISED BY G. MICHAEL POOR

*Waco, TX*

*July 2015*

### Bowling Green State University

B.S. IN COMPUTER SCIENCE

*Bowling Green, OH*

*May 2013*

## Honors & Awards

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2019	<b>Best Paper Nominee</b> , ACM ASSETS 2019	<i>Pittsburgh, USA</i>
2019	<b>Best Paper Honourable Mention</b> , ACM CHI 2019	<i>Glasgow, Scotland</i>
2018	<b>Best Paper Honourable Mention</b> , ACM CHI 2018	<i>Montreal, CA</i>
2015	<b>Best Poster</b> , ACM SUI 2015	<i>Los Angeles, USA</i>

## Teaching Experience

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<b>Fundamentals of Human-Computer Interaction</b> , Teaching Assistant	<i>Summer 2020</i>
<b>Fundamentals of Human-Computer Interaction</b> , Teaching Assistant	<i>Spring 2020</i>
<b>Fundamentals of Human-Computer Interaction</b> , Teaching Assistant	<i>Fall 2019</i>
<b>Introduction to Programming</b> , Teaching Assistant	<i>Summer 2019</i>
<b>Fundamentals of Human-Computer Interaction</b> , Teaching Assistant	<i>Spring 2019</i>
<b>ICTD Laboratory</b> , Instructor	<i>Fall 2018</i>
<b>User-Centered Design &amp; Development I</b> , Teaching Assistant	<i>Fall 2016</i>

## Invited Talks

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2019	<b>A Brief Introduction to the Superhuman Computing Lab</b> , CU Science Discovery's Teen Science Café	<i>Boulder, USA</i>
2018	<b>Using Robots to Create Tactile Learning Experiences</b> , Tactile Graphics in Education and Careers Symposium	<i>Baltimore, USA</i>

## Conference Papers

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1. Kyle Reinholt, **Darren Guinness**, and Shaun K. Kane. 2019. EyeDescribe: Combining Eye Gaze and Speech to Automatically Create Accessible Touch Screen Artwork. In Proceedings of the 2019 ACM International Conference on Interactive Surfaces and Spaces (ISS '19). Association for Computing Machinery, New York, NY, USA, 101–112. DOI:<https://doi.org/10.1145/3343055.3359722>
2. **Darren Guinness**, Annika Muehlbradt, Daniel Szafir, and Shaun K. Kane. 2019. RoboGraphics: Dynamic Tactile Graphics Powered by Mobile Robots. In The 21st International ACM SIGACCESS Conference on Computers and Accessibility (ASSETS '19). Association for Computing Machinery, New York, NY, USA, 318–328. DOI:<https://doi.org/10.1145/3308561.3353804> **Best Paper Nominee**
3. Varsha Koushik, **Darren Guinness**, and Shaun K. Kane. 2019. StoryBlocks: A Tangible Programming Game To Create Accessible Audio Stories. In Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems (CHI '19). ACM, New York, NY, USA, Paper 492, 12 pages. DOI:<https://doi.org/10.1145/3290605.3300722> **Best Paper Honourable Mention**
4. **Darren Guinness**, Annika Muehlbradt, Daniel Szafir, and Shaun K. Kane. 2018. The Haptic Video Player: Using Mobile Robots to Create Tangible Video Annotations. In Proceedings of the 2018 ACM International Conference on Interactive Surfaces and Spaces (ISS '18). ACM, New York, NY, USA, 203-211. DOI: <https://doi.org/10.1145/3279778.3279805>
5. Annika Muehlbradt, Madhur Atreya, **Darren Guinness**, and Shaun K. Kane. 2018. Exploring the Design of Audio-Kinetic Graphics for Education. In Proceedings of the 20th ACM International Conference on Multimodal Interaction (ICMI '18). ACM, New York, NY, USA, 455-463. DOI:<https://doi.org/10.1145/3242969.3243004>
6. **Darren Guinness**, Edward Cutrell, and Meredith Ringel Morris. 2018. Caption Crawler: Enabling Reusable Alternative Text Descriptions using Reverse Image Search. In Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems (CHI '18). ACM, New York, NY, USA, Paper 518, 11 pages. DOI: <https://doi.org/10.1145/3173574.3174092> **Best Paper Honourable Mention**
7. **Darren Guinness**, Daniel Szafir, and Shaun K. Kane. 2017. GUI Robots: Using Off-the-Shelf Robots as Tangible Input and Output Devices for Unmodified GUI Applications. In Proceedings of the 2017 Conference on Designing Interactive Systems (DIS '17). ACM, New York, NY, USA, 767-778. DOI: <https://doi.org/10.1145/3064663.3064706>
8. Ashley Dover, G. Michael Poor, **Darren Guinness**, and Alvin Jude. 2016. Improving Gestural Interaction With Augmented Cursors. In Proceedings of the 2016 Symposium on Spatial User Interaction (SUI '16). ACM, New York, NY, USA, 135-138. DOI: <https://doi.org/10.1145/298331-0.2985765>
9. **Darren Guinness**, Alvin Jude, G. Michael Poor, and Ashley Dover. 2015. Models for Rested Touchless Gestural Interaction. In Proceedings of the 3rd ACM Symposium on Spatial User Interaction (SUI '15). ACM, New York, NY, USA, 34-43. DOI: <https://doi.org/10.1145/2788940.2788948>
10. Alvin Jude, G. Michael Poor, and **Darren Guinness**. 2014. An evaluation of touchless hand gestural interaction for pointing tasks with preferred and non-preferred hands. In Proceedings of the 8th Nordic Conference on Human-Computer Interaction: Fun, Fast, Foundational (NordiCHI '14). ACM, New York, NY, USA, 668-676. DOI: <https://doi.org/10.1145/2639189.2641207>

## Posters

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1. **Darren Guinness**, Annika Muehlbradt, Daniel Szafir, and Shaun K. Kane. 2019. RoboGraphics: Using Mobile Robots to Create Dynamic Tactile Graphics. In The 21st International ACM SIGACCESS Conference on Computers and Accessibility (ASSETS '19). Association for Computing Machinery, New York, NY, USA, 673–675. DOI: <https://doi.org/10.1145/3308561.3354597>
2. **Darren Guinness**. 2018. Using robots to improve the accessibility of online videos. SIGACCESS Access. Comput. 120 (January 2018), 20-23. DOI: <https://doi.org/10.1145/3178412.3178416>
3. Alvin Jude, G. Michael Poor, and **Darren Guinness**. 2016. Grasp, Grab or Pinch? Identifying User Preference for In-Air Gestural Manipulation. In Proceedings of the 2016 Symposium on Spatial User Interaction (SUI '16). ACM, New York, NY, USA, 219-219. DOI: <https://doi.org/10.1145/2983310.2989209>
4. Alvin Jude, **Darren Guinness**, and G. Michael Poor. 2016. Reporting and Visualizing Fitts's Law: Dataset, Tools and Methodologies. In Proceedings of the 2016 CHI Conference Extended Abstracts on Human Factors in Computing Systems (CHI EA '16). ACM, New York, NY, USA, 2519-2525. DOI: <https://doi.org/10.1145/2851581.2892364>
5. **Darren Guinness**, Andrew Seung, Ashley Dover, G. Michael Poor, and Alvin Jude. 2015. Modeling Mid-air Gestures With Spherical Coordinates. In Proceedings of the 3rd ACM Symposium on Spatial User Interaction (SUI '15). ACM, New York, NY, USA, 133-133. DOI: <https://doi.org/10.1145/2788940.2794356> **Best Poster - SUI 2015**
6. Alvin Jude, G. Michael Poor, and **Darren Guinness**. 2014. Evaluating multimodal interaction with gestures and speech for point and select tasks. In Proceedings of the 8th Nordic Conference on Human-Computer Interaction: Fun, Fast, Foundational (NordCHI '14). ACM, New York, NY, USA, 1027-1030. DOI: <https://doi.org/10.1145/2639189.2670267>
7. **Darren Guinness**, G. Michael Poor, and Alvin Jude. 2014. Gestures with speech for hand-impaired persons. In Proceedings of the 16th international ACM SIGACCESS conference on Computers & accessibility (ASSETS '14). ACM, New York, NY, USA, 259-260. DOI: <https://doi.org/10.1145/2661334.2661398>
8. Alvin Jude, G. Michael Poor, and **Darren Guinness**. 2014. Personal space: user defined gesture space for GUI interaction. In CHI '14 Extended Abstracts on Human Factors in Computing Systems (CHI EA '14). ACM, New York, NY, USA, 1615-1620. DOI: <http://dx.doi.org/10.1145/2559206.2581242>
9. Poor, G. M., Brianna J. Tomlinson, **Darren Guinness**, Samuel D. Jaffee, Laura M. Leventhal, Guy Zimmerman, and Dale S. Klopfer. "Tangible or gestural: comparing tangible vs. Kinect™ interactions with an object manipulation task." In 7th International Conference on Tangible, Embedded and Embodied Interaction. 2013.

## Press

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- 2019 **Caption Crawler Release**, Microsoft
- 2018 **Researchers' innovation provides a richer web-browsing experience for people who are blind**, Microsoft
- 2018 **The Radical Frontier of Inclusive Design**, Fast Company
- 2018 **Browser extension helps the visually impaired interpret online images**, TechXplore
- 2017 **Software framework turns small robots into controllers**, CU ATLAS

## Service

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2020-2021	<b>Reviewer</b> , ACM TACCESS	<i>Baltimore, USA</i>
2020	<b>Reviewer</b> , ACM CHI	<i>Honolulu, USA</i>
2019	<b>Reviewer, Student Volunteer</b> , ACM CHI	<i>Glasgow, Scotland</i>
2018	<b>Student Volunteer</b> , ACM ISS	<i>Tokyo, Japan</i>
2018	<b>Associate Chair, Student Volunteer</b> , 2018 ACM CHI Late-Breaking Work	<i>Montreal, CA</i>
2018	<b>Reviewer</b> , ACM Transactions on Computer-Human Interaction	<i>Denver, USA</i>
2018	<b>Reviewer</b> , ACM/IEEE HRI	<i>Chicago, USA</i>
2018	<b>Reviewer</b> , ACM DIS	<i>Hong Kong, China</i>
2017	<b>Reviewer, Student Volunteer</b> , ACM CHI	<i>Denver, USA</i>
2017	<b>Student Volunteer</b> , ACM ASSETS	<i>Baltimore, USA</i>
2017	<b>Reviewer</b> , ACM/IEEE HRI	<i>Vienna, Austria</i>
2017	<b>Reviewer</b> , ACM UIST	<i>Quebec City, CA</i>
2017	<b>Reviewer</b> , ACM TEI	<i>Yokohama, Japan</i>
2016	<b>Reviewer</b> , Elsevier International Journal of Human-Computer Studies	<i>Boulder, USA</i>
2016	<b>Reviewer, Student Volunteer</b> , ACM CHI	<i>San Jose, USA</i>

## Mentoring

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- 2014-2015 **Andrew Seung**, M.S. student at Baylor University
- 2014-2015 **Ashley Dover**, M.S. student at Baylor University
- 2015-2020 **Varsha Koushik**, PhD. student at University of Colorado Boulder
- 2016-2020 **Annika Muehlbradt**, PhD. student at University of Colorado Boulder
- 2018-2020 **Gabriella Johnson**, PhD. student at University of Colorado Boulder
- 2018-2020 **Vinitha Gadiraju**, PhD. student at University of Colorado Boulder