RESEARCH INTERESTS

I study and make observations about human behavior to inform the invention of novel technologies. Based on these observations, I prototype software and hardware systems and hypothesize how these novel systems will affect human behavior. I evaluate these ideas by designing, developing, and deploying studies where people use my prototypes and determine how these new technologies benefit, affect, or alter their behavior.

Some recent interests of mine include:
Novel Sensor Design • Generative Design • Ubiquitous Computing • Human-Computer Interactions • Virtual Reality • Human-AI Interaction • Accessibility • Creativity Support Tools

A note on publication venues: in my primary area of research, Human Computer Interaction, the ACM Conference on Human Factors in Computing Systems (CHI) is considered one of the best forums for dissemination of research results and covers the broad spectrum of research in Human Computer Interaction. The ACM Symposium on User Interface Software and Technology (UIST) is of similar quality, but is focused on a particular sub-area of the field, namely interactive techniques and devices. Papers in these conferences are refereed as full papers, and have an acceptance rate of around 15-25% each year.

PEER-REVIEWED PROCEEDINGS


**PATENTS**


**MANUSCRIPTS IN PREPARATION**


M2. Josh Urban Davis, Yizhe Zu, Xing-Dong Yang. “PantoTouch: Enabling Precision Gestural Input on Smart Watches Using a Pantograph”


**AWARDS**

- Best Paper Award Creativity and Cognition (C&C’21)
- Best Paper Nomination Accessibility and Computing (ASSETS’21)
Neukom Institute Award for Outstanding Graduate Research 2020
Best Paper Honorable Mention Human Factors in Computing (CHI’20)
Neukom Institute Grant 2019
Dartmouth Graduate Student Fellowship

INVITED TALKS

- MIT HCI Engineering Group, Massachusetts Institute of Technology (Cambridge, MA) “Systems for Democratizing Creativity” (Virtual 2022)
- Art and Computation Reading Group, Adobe Research, (San Francisco, CA) “A Brief History of Generative Art and Design” (Virtual 2021)
- Center for Accessibility and Inclusion Research (CAIR), iSchool of the Golisano College of Computing and Information Sciences at RIT, (Rochester, NY) “Accessible Creativity: Wearables, Generative Design, and Inclusive Human-AI Co-Creation” (Virtual 2021)
- HCI Reading Group, Adobe Research, (San Jose, CA) “Making on Your Feet, Semi-extemporaneous Presentations in Mixed-Reality”
- Harvard Graduate School of Design, Harvard University, (Cambridge, MA) “Accessible Creativity: Wearables, Generative Design, and Inclusive Human-AI Co-Creation” (Virtual ’20)
- Summer HCI Talks, Microsoft Research, (Redmond, WA) “Exploring the Accessibility of Personal Protective Equipment (PPE), Wearables, and Beyond” (Virtual) 2020
- Taste of Science Houston, (Houston, TX) “Sonnets and Science, A Brief History and Future of Computational Poetry” (Virtual) 2020
- Ability Team, Microsoft Research, (Redmond, WA) “Project PokerFace: Designing an Interactive Mixed-Reality Mask” (Virtual) 2020
- RiSE Group, Microsoft Research, (Redmond, WA) “Make It or Break It: Design Considerations When Making During a Crisis” (Virtual) 2020
- MIT Computer Science and Artificial Intelligence Laboratory, (Boton, MA) Fabrication at CHI, “Tangible Circuits: An Interactive 3D Printed Circuit Education Tool for People with Visual Impairments” (Virtual) 2020
- Thayer School of Engineering (Hanover, NH) “Creating Tools for Accessible STEAM Education” (Virtual) 2020
- Autodesk Research (Toronto, ON) “Creative Support Tools in Virtual Environments with Generative Design” 2020

RESEARCH EXPERIENCE

Adobe Research, Research Intern
GILL Lab
Mentor: Paul Asente
June 2021 – September 2021

- Prototyped a gesture and speech driven mixed-reality interface using Javascript, HTML/CSS, MediaPipe, and OpenCV
- Studied the habits of presenters in virtual telepresence environments through formative studies
- Developed a programming-by-demonstration authoring environment for mixed-reality
- Presented talks on evolving personal research projects to lab meetings and reading groups
- Evaluated prototype in study and reported results intended to be submitted for publication
Microsoft Research, Research Intern  
Future Wearables Lab, RISE Group, and Ability Team  
Mentor: John Tang, Teddy Seyed, Edward Cutrell,  
June 2020 – September 2020

- Deployed studies examining the accessibility of wearables and personal protective equipment masks for people with special needs
- Submitted findings from accessibility study for publication at ACM SIGACCESS
- Prototyped an interactive mask which uses a commodity smartphone to enable live translation, captions, and expressivity
- Evaluated prototype in study and reported results intended to be submitted for publication to Human Factors in Computing (CHI)
- Facilitated partnerships between the research team and commercial interests in order to patent and develop prototype into product

Autodesk Research, User Interface Research Intern  
HCI and Graphics Research Group  
Mentor: Fraser Anderson, Tovi Grossman, George Fitzmaurice  
January 2020 – May 2020

- Designed interfaces for virtual reality which facilitated fluid human-ai interaction
- Developed and evaluated novel interaction methods intended in publication (User Interface Software Technology UIST)
- Prototyped and deployed interactive generative design systems using generative adversarial networks for virtual reality

XDiscovery Lab, Dartmouth College, Graduate Student Researcher  
Mentor: Xing-Dong Yang  
March 2018 - Present

- Prototyped post-touch screen devices and novel sensing techniques
- Developed and evaluated novel interaction methods resulting in publication (Human Factors in Computing CHI and User Interface Software Technology UIST)
- Collaborated with Kelley Center for the blind to implement enabling technologies for visually disabled users.

Bregmann Media Labs, Media Arts and Sciences Researcher  
Mentor: Michael Casey, Grace Leslie  
February 2017 – February 2018

- Analyzed fMRI data for signal reconstruction of auditory stimuli
- Developed novel brain-computer interaction methods for creating paintings and music
- Led experiment team in collection of EEG and user experience data
- Presented and demonstrated brain-computer interaction techniques at multiple venues (Human Factors in Computing CHI and New Interfaces for Musical Expression NIME)

DALI Lab, Developer II  
August 2016 – February 2017
• Led team of designers and developers to create virtual reality and biofeedback systems
• Collaborated with NASA and the Space Medicine Laboratory at Geisel Medical School to create virtual reality content for space flights
• Prototyped biofeedback systems for virtual reality to provide assistive health and well-being
• Developed and edited 360 video and 3D modeled VR environments with Unity and Adobe Creative Suite

EDUCATION AND TRAINING

Dartmouth College, Hanover, NH. 2018-Present
Ph.D in Computer Science
Department of Computer Science Human Computer Interaction Lab
Advisors: Prof. Xing-Dong Yang

Dartmouth College, Hanover, NH. 2016-2018
M.S. in Computer Science and Digital Arts
Bregman Media Labs and Department of Computer Science
Advisors: Prof. Michael Casey, Prof. Xing-Dong Yang, Prof. Grace Leslie

BIO

+ pronouns: any pronoun is fine +

Josh Urban Davis is an american research-based artist and engineer from Texas whose practice incorporates sculpture, performance, writing, sound, and video. His research interests span a wide spectrum of topics in human-computer interaction (HCI), with a specific emphasis on generative design, novel creativity support tools, and inclusive technologies. Davis’ recent creative projects explore the relationship between emerging technologies, social relationships, and identity. His work has been exhibited at DiverseWorks, the Blaffer Art Museum, Chandler Center for the Arts, Art League Houston, and was featured in collaboration with the New School as part of the Venice Architecture Biennale in 2021. He currently lives in Oakland, CA with his cat, Nocturne, where he is pursuing a PhD in computer sciences at Dartmouth.

CREATIVE WORK

EXHIBITIONS AND PERFORMANCES

+ 2022
  + Hideouts. Creativity and Cognition Gallery 2021. Venice, Italy 2022

+ 2021
  + RipTides of the Mind. Biennale Architettura 2021. Supported by a grant from the New School. Venice, Italy. 2022

+ 2020
  + The Night Air COVID poetry project, Virtual. Supported by a grant from Houston Arts Alliance and Art League Houston. 2020

+ 2019
  + An Archive of Feeling, Chandler Gallery, Randolph, VT. 2019
  + New Century/New Materials, Heritage Gallery at Alternatives, Whitinsville, MA. 2019
  + IllumiWear: Concert for Fabric and Light, NIME, Puerto Alegre, Brazil. 2019
  + Science and Sonnets: Creative Turing Test, Pint of Science, Houston, TX. 2019
Lion’s Den, BETA Theatre and DinoLion Productions, (Creative Technologist Collaborator) Houston, TX. 2019

2018
+ Stabat Mater: For Voice and Electronics, SHIFT Festival, (Electronics and Visuals Collaborator) Hanover, NH. 2018
+ Postcards from the Electric Void, Artificial Intelligence and Art, Montreal, QC. 2018

2017
+ Synapstraction, Digital Arts Expo, Black Visual Arts Center, Hanover, NH. 2017
+ Mixtape, Hardy and Nance Studios, Houston, TX. 2017

2016
RedHoust, BETA Theatre and DinoLion Productions, (Script Writing Collaborator) Houston, TX. 2016

2015
+ The Big Machine, El Rincoln Sociale. Houston, TX 2015

2014
+ Submission, Silver Street Studios. Houston, TX. 2014

2012
+ Cohesion, Gallery M Squared, Houston TX. 2012
+ A Taste of Red Ink, G Gallery, Houston TX. 2012

2011
+ The Big Show, Lawndale Contemporary Arts Center, Houston, TX. Runner-up: Best in Show (Juror: Larissa Harris, Curator, Queens Museum of Art, New York, NY) 2011
+ State Fair, DiverseWorks Alternative Art Space, Houston, TX. 2011
  (Juror: Diane Barber, Executive Director, DiverseWorks Alternative Art Space, Houston, TX)
+ Luck of the Draw, DiverseWorks Alternative Art Space, Houston TX. 2011
+ East Austin Studio Tour, Home for Misfit Ideas, Austin, TX. 2011
  (Juror: Lizzie Pelz, Curator, Home for Misfit Ideas, Austin, TX)
+ Ekphrastic: Dionesia, University of Houston Honors College, Houston TX. 2011

PUBLICITY AND CREATIVE PUBLICATIONS

Interview with Aetheia Literary Magazine Online. 14 Feb. 2012

REFERENCES

Prof. Xing-Dong Yang
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Dartmouth College
HB 6211
xing-dong.yang@dartmouth.edu

Dr. Fraser Anderson
HCI and Visualization Research Group
Autodesk Research, Toronto
Fraser.anderson@autodesk.com

Prof. Michael Casey
Director, Graduate Program in Digital Musics, Professor of Computer Science
Dartmouth College
Hallgarten Hall, Room 103
HB 6242
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Prof. Grace Leslie
Department of Music Technology
Georgia Institute of Technology
grace.leslie@gatech.edu

Prof. Lorie Loeb
Faculty Director, DALI Lab
Research Professor
Director, Digital Arts Program
Dartmouth College
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