

JOSH URBAN DAVIS

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RESEARCH INTERESTS

Novel Sensor Design • Generative Design • Ubiquitous Computing • Human-Computer Interactions • Post-Touch-Screen Interactive Devices • Machine Learning • Biofeedback • Virtual Reality • Human-AI Interaction • Accessibility • Enabling Technologies •

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

1. **Josh Urban Davis**, Te-Yen Wu, Bo Shi, Hanyi Lu, Athina Panotopoulou, Emily Whiting, Xing-Dong Yang. "TangibleCircuits: An Interactive 3D Printed Circuit Education Tool for People with Visual Impairments". Proceedings of Human Factors in Computing (**CHI**'20). Honolulu, Hawaii. 2020. [Acceptance Rate: 24.31%] [Best Paper: Top 5%] [Neukom Institute Award for Outstanding Graduate Research]
2. **Josh Urban Davis**, Jun Gong, Yunxin Sun, Parmit Chilana, Xing-Dong Yang. "CircuitStyle: A System for Peripherally Reinforcing Best Practices in Hardware Computing". Proceedings of User Interfaces Software Technology (**UIST**'19) New Orleans, LA. 2019. [Acceptance Rate: 20.6%]
3. **Josh Urban Davis**. "IllumiWear: A Bendable Interactive Fiber-Optic eTextile for Audio and Visual Interactions." Proceedings of New Interfaces in Musical Expression (**NIME**'19). Porto Alegre, Brazil. 2019. [Acceptance Rate: 31%]
4. Jun Gong, Xin Yang, Teddy Sayed, **Josh Urban Davis**, Xing-Dong Yang. "Indutivo: Contact-Based Object-Driven Interactions with Inductive Sensing." Proceedings of User Interface Software Technology (**UIST**'18), Berlin, Germany. 2018. [Acceptance Rate: 21%]
5. **Josh Urban Davis**. "Postcards from the Electric Void: Interactive Generation of Animations, Images, and Sound Using Adversarial Learning". Second Workshop on Machine Learning for Creativity and Design, Neuro Information Systems Processing (**NerulIPS**'18). Montreal, QC. 2018. [Acceptance Rate: 21%]
6. **Josh Urban Davis**. "The Gender Generator: Towards a Brain-Computer Interface for Evocation of Gender Dysphoria Symptoms." Proceedings of the 8th Annual Workshop on Creative Applications of Brain-Computer Interfacing, Human Factors in Computing (**CHI**'18). Montreal, QC. 2018. [Acceptance Rate: 27%]

7. Fatih Akdag, **Josh Urban Davis**, Christoph Eick. "A Computational Framework for Finding Interestingness Hotspots in Large Spatio-Temporal Grids." Proceedings of the 3rd ACM SIGSPATIAL International Workshop on Analytics for Big Geospatial Data, (**SIGSPATIAL'** 2014). [Acceptance Rate: 22.5%]

MANUSCRIPTS IN PREPARATION

1. Josh Urban Davis, Fraser Anderson, Merten Stroezel, Tovi Grossman, George Fitzmaurice "Calliope: Supporting Human-AI Creative Collaboration in Virtual Environments"
2. Josh Urban Davis, Yizhe Zu, Xing-Dong Yang. "PantoTouch: Enabling Precision Gestural Input on Smart Watches Using a Pantograph"
3. Jun Gong, Teddy Sayed, Josh Urban Davis, Songlin Xu, Yao Zou, Yuke Wang, Xin Lui, Da-Yuan Huang, Xing-Dong Yang. " SpringBoard: A Haptic Feedback System for Breadboards Using Virtual Springs."

PATENTS

1. Calliope: A System for Supporting Human-AI Collaboration in Virtual Environments. Josh Urban Davis, Fraser Anderson, George Fitzmaurice. (Pending)
2. Circuit Style: A System for Peripherally Reinforcing Best Practices in Hardware Computing. Josh Urban Davis, Jun Gong, Parmit Chilana, Xing-Dong Yang (No. 62/916,977)

AWARDS

- Neukom Institute Award for Outstanding Graduate Research 2020
- Best Paper Honorable Mention Human Factors in Computing (**CHI'20**)
- Neukom Institute Travel Grant 2019
- Dartmouth Graduate Student Fellowship

INVITED TALKS

- 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, (Boston, 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

Microsoft Research, Research Intern
Future Wearables Lab, RiSE Group, and Ability Team
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 a prototype 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
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
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
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

University of Houston, Houston, TX. 2016

B.S. Computer Science

B.F.A. Studio Arts

Cum Laude

Areas of Concentration: Natural Language Processing, Machine Learning, New Media, Interactive Installation

BIO

Josh Urban Davis is a research based artist and engineer whose practice spans sculpture, filmmaking, projection, and site-specific performance and installations. He holds a BFA in studio art and BS in computer science as well as an MS in computer sciences and digital arts. Recent projects draw inspiration from speculative fiction to explore the relationship between emerging technologies, social relationships, and identity. Explicitly engaged with the very technologies that he critiques, Davis's work viscerally confronts the viewer, inviting contemplation of the role new technologies play in mediating and reimagining our understanding of reality, corporeality, and identity. His work has been exhibited at DiverseWorks, the Blaffer Art Museum, Art League, Houston, Black Visual Arts Center, Alternatives, Chandler Gallery, and others. They currently live in Hanover, NH with their cat, Nocturne, where they are pursuing a PhD in computer sciences at Dartmouth.

CREATIVE WORK

EXHIBITIONS AND PERFORMANCES

+ 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
Drawing the Perfect Line, Box 13 Artspace, Lonestar Explosion Performance Art Biennale.
Houston, TX. (Curated by Julia Wallace and Jonatan Lopez). 2015.
The Big Machine, El Rincón 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

"Janus Turned" poem, "Vitrine #6", and "A Plea for Dorian Gray" images, Glass Mountain Literary
Magazine 20 Feb. 2012.
"The Buried Orchestra" cover image, The Aletheia Literary Magazine 21 Feb. 2012.
Interview with Aletheia Literary Magazine Online. 14 Feb. 2012
Klaasmeyer, Kelly. "A State Affair." Houston Press 12 Oct. 2011.
Britt, Douglas. "DiverseWorks' State Fair Offers Alternative to Art Fairs." The Houston Chronicle 7
Sept. 2011.
Hancock, Hank. "Fair Game." Art + Culture 11 Sept. 2011.
"Op 1 No 5" image, The Aletheia Literary Magazine 15 Sept. 2011.

REFERENCES

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