GIERAD LAPUT

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Human-Computer Interaction Institute
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Overview: My research in HCI lies at the intersection of interactive systems, sensing, and applied machine learning. I design, build, and evaluate novel interactive technologies that greatly enhance input expressivity for users and contextual awareness for devices. These often lie in application-driven domains such as ubiquitous and wearable computing, smart environments, and the Internet of Things (IoT).

EDUCATION

Carnegie Mellon University, School of Computer Science — Aug 2013 - Present
ABD, Ph.D., Human-Computer Interaction
Future Interfaces Group. Advisor: *Chris Harrison*

University of Michigan — Apr 2013
M.S.I. Human-Computer Interaction
Advisor: *Eytan Adar*

University of Michigan — May 2009
B.S. Electrical Engineering
Magna Cum Laude, 1st Place Senior Capstone Project

AWARDS AND HONORS

Google PhD Fellowship in Human-Computer Interaction 2018
Swartz Innovation Fellowship, $100K Towards Entrepreneurship 2018
McGinnis Venture Capital Award 2018
Fast Company Innovation by Design Award 2017
Best Paper Award, ACM UIST 2016 2016
Best Talk Award, ACM UIST 2016 2016
Best Paper Award, ACM CHI 2015 2015
Best Talk Award, ACM UIST 2015 2015
Adobe Research Fellowship 2016
Qualcomm Innovation Fellowship 2014
Yahoo! InMind Fellowship 2014
Disney Research Fellowship 2013

PEER-REVIEWED PUBLICATIONS

I publish my research at premiere venues in Human-Computer Interaction.

[29] **Laput, G**., Harrison, C. 2019. Exploring the Efficacy of Sparse, General-Purpose Sensor Constellations for Wide-Area Ubiquitous Sensing. To appear in *Proceedings of the ACM annual conference on Interactive, Mobile, and Ubiquitous Technologies* (London, UK, September 11 - 13, 2019). IMWUT '19. ACM, New York, NY.

[28] **Laput, G**., Harrison, C. 2019. SurfaceSight: A New Spin on Touch, User, and Object Sensing for IoT Experiences. To appear in *Proceedings of the ACM annual conference on Human Factors in Computing Systems* (Glasgow, Scotland, May 4 - 9, 2019). CHI '19. ACM, New York, NY.

[27] **Laput, G**., Harrison, C. 2019. Investigating Fine-Grained Hand Activities Using Commodity Smartwatches. To appear in *Proceedings of the ACM annual conference on Human Factors in Computing Systems* (Glasgow, Scotland, May 4 - 9, 2019). CHI '19. ACM, New York, NY.

[26] Markvicka, E., Wang, G., Lee, Y., **Laput, G.**, Majidi, C., Yao, L. 2019. ElectroDermis: Fully Untethered, Stretchable, and Highly-Customizable Electronic Bandages. To appear in *Proceedings of the ACM annual conference on Human Factors in Computing Systems* (Glasgow, Scotland, May 4 - 9, 2019). CHI '19. ACM, New York, NY.

[25] Zhang, Y., Pahud, M., Holz, C., Xia, H., **Laput, G.**, McGuffin, M., Tu, X., Mittereder, A., Su, F., Buxton, W., Hinckley, K. 2019. Sensing Posture-Aware Pen+Touch Interaction on Tablets. To appear in *Proc. of the ACM annual conference on Human Factors in Computing Systems* (Glasgow, Scotland, May 4 - 9, 2019). CHI '19. ACM, New York, NY. **Best Paper Nomination**.

[24] **Laput, G**., Ahuja, K., Goel, M., Harrison, C. 2018. Ubicoustics: Plug-and-Play Acoustic Activity Recognition. In *Proceedings of the 31st Annual ACM symposium on user interface software and technology* (Berlin, Germany, October 14 - 17, 2018). UIST '18. ACM, New York. 213 - 224.

[23] Zhang, Y., **Laput, G**., Harrison, C. 2018. Vibrosight: Long-Range Vibrometry for Activity Detection. In *Proceedings of the 31st Annual ACM symposium on user interface software and technology* (Berlin, Germany, October 14 - 17, 2018). UIST '18. 225 - 236. **Best Paper Nomination**.

[22] Carrington, P., **Laput, G**., Bigham, J.P. 2018. Exploring Data Tracking and Sharing Preferences of Wheelchair Athletes. In *Proceedings of the ACM annual conference on Computers and Accessibility* (Galway, Ireland, October 22 - 24, 2018). ASSETS '18. ACM, New York, NY. 242 - 248. **Best Paper Nomination**.

[21] Guo, A., Jain, A., **Laput, G**., Harrison, C., Bigham, J.P. 2018. Crowd-AI Camera Sensing in the Real World. In *Proceedings of the ACM Journal on Interactive, Mobile, Wearable, and Ubiquitous Technologies* (Singapore, October 8 - 12, 2018). UbiComp '18. ACM, New York, NY

[20] **Laput, G**., Zhang, Y., Harrison, C. 2017. Synthetic Sensors: Towards General-Purpose Sensing. In *Proceedings of the ACM annual conference on Human Factors in Computing Systems* (Denver, Colorado, May 6 - 11, 2017). CHI '17. ACM, New York, NY. 3986 - 3999. **Fast Company Innovation by Design Finalist.**

[19] Das, S., **Laput, G**., Harrison, C., Hong, J. 2017. Thumprint: Socially-Inclusive Local Group Authentication Through Shared Secret Knocks. in *Proceedings of the ACM annual conference on Human Factors in Computing Systems* (Denver, Colorado, May 6 - 11, 2017). CHI '17. ACM, New York, NY. 3764 - 3774. **Best Paper Nomination**.

[18] Xiao, R., **Laput, G**., Zhang, Y., Harrison, C. 2017. Deus EM Machina: On-Touch Contextual Functionality for Smart IoT Appliances. In *Proceedings of the ACM annual conference on Human Factors in Computing Systems* (Denver, Colorado, May 6 - 11, 2017). CHI '17. ACM, New York, NY. 4000 - 4008.

[17] Zhang, Y., **Laput, G**., Harrison, C. 2017. Electrick: Low-Cost Touch Sensing for Large, Irregular and Rapidly-Prototyped Objects. To appear in *Proc. CHI '17* (Denver, Colorado, May 6 - 11, 2017). ACM, New York, NY. 1 - 14.

[16] He, L., **Laput, G**., Brockmeyer, E., Froehlich, J., C. 2017. SqueezaPulse: Adding Interactive Input to Fabricated Objects Using Corrugated Tubes and Air Pulses. In *Proc. of the ACM TEI '18* (Yokohama, Japan, March 20-23, 2017). ACM, New York.

[15] **Laput, G**., Xiao, R., Harrison, C. 2016. ViBand: High-Fidelity Bio-Acoustic Sensing Using Commodity Smartwatch Accelerometers. In *Proceedings of the ACM symposium on user interface software and technology* (Tokyo, Japan, October 16 - 19, 2016). UIST '16. ACM, New York. 321 - 333. **Best Paper Award. Best Talk Award.**

[14] Zhou, J., Zhang, Y., **Laput, G**., Harrison, C. 2016. AuraSense: Enabling Expressing Around-Smartwatch Interactions with Electric Field Sensing. In *Proceedings of the ACM symposium on User interface software and technology* (Tokyo, Japan, October 16 - 19, 2016). UIST '16. ACM, New York. 81 - 86.

[13] Zhang, Y., Zhou, J., **Laput, G**., Harrison, C. 2016. SkinTrack: Using the Body as an Electrical Waveguide for Continuous Finger Tracking on the Skin. In *Proceedings of the ACM annual conference on Human Factors in Computing Systems* (San Jose, California, May 7 - 12, 2016). CHI '16. ACM, New York, NY. 1491 - 1503. **Best Paper Nomination**.

[12] **Laput, G**., Chen, X.A., Harrison, C. 2016. SweepSense: Ad Hoc Configuration Sensing Using Reflected Swept-Frequency Ultrasonics. in *Proceedings of the ACM International Conference on Intelligent User Interfaces* (Sonoma, California March 7 - 10, 2016). IUI '16. ACM, New York, NY. 332 - 335.

[11] **Laput, G**., Yang, C., Xiao, R., Sample, A., Harrison, C. 2015. EM-Sense: Touch Recognition of Uninstrumented, Electrical and Electromechanical Objects. In *Proceedings of User Interface. and Soft. Techn.* (Charlotte, North Carolina, November 8 - 11, 2015). UIST '15. ACM, New York, NY. 157 - 166. **Best Talk Award**. **Fast Company Innovation by Design Award**.

[10] **Laput, G.**, Chen, X.A., Harrison, C. 2015. 3D Printed Hair: Fused Deposition Modeling of Soft Strands, Fibers, and Bristles. In *Proceedings of the annual ACM symposium on User interface software and technology* (Charlotte, North Carolina, November 8 - 11, 2015). UIST '15. ACM, New York, NY. 593 - 597.

[9] **Laput, G.**, Brockmeyer, E., Hudson, S.E., Harrison, C. 2015. Acoustruments: Passive, Acoustically-Driven, Interactive Controls for Handheld Devices. In *Proceedings of the ACM annual conference on Human Factors in Computing Systems* (Seoul, South Korea, April 18 - 23, 2015). CHI '15. ACM, New York, NY. 2161 - 2170. **Best Paper Award.**

[8] **Laput, G.**, Lasecki, W., Weise, J., Xiao, R., Bigham, J., Harrison, C. 2015. Zensors: Adaptive, Rapidly Deployable, Human-Intelligent Sensor Feeds. In *Proceedings of the ACM conference on Human Factors in Computing Systems* (Seoul, South Korea, April 18 - 23, 2015). CHI '15. ACM, New York, NY. 1935 - 1944.

[7] **Laput, G.**, Xiao, R., Chen, X.A., Hudson, S.E., Harrison, C. 2014. Skin Buttons: Cheap, Small, Low-Powered and Clickable Fixed-Icon Laser Projectors. *In Proceedings of the annual ACM symposium on User interface software and technology* (Honolulu, HI, October 5 - 8, 2014). UIST '14. ACM, New York, NY. 389 - 394.

[6] Adar, E., Dontcheva, M., **Laput, G.** 2014. CommandSpace: Modeling the Relationships Between Tasks, Descriptions and Features. In *Proceedings of the annual ACM symposium on User interface software and technology* (Honolulu, Hawaii, October 5 - 8, 2014). UIST '14. ACM, New York, NY. 167 - 176.

[5] Xiao, R., **Laput, G.**, Harrison, C. 2014. Expanding the Input Expressivity of Smartwatches with Physical Pan, Twist, Tilt, and Click. In *Proceedings of the annual ACM conference on Human Factors in Computing Systems* (Toronto, Canada, April 26 - May 1, 2014). CHI '14. ACM, New York, NY. 193 - 196.

[4] Dixon, M.E., **Laput, G.**, Fogarty, J. 2014. Pixel-Based Methods for Widget State and Style in a Runtime Implementation of Sliding Widgets. In *Proc. CHI '14* (Toronto, Canada, April 26 - May 1, 2014). ACM, New York, NY. 2231 - 2240.

[3] **Laput, G.**, Dontcheva, M., Wilensky, G., Chang, W., Agarwala, A., Linder, J., Adar, E. 2013. PixelTone: A Multimodal Interface for Image Editing. In *Proceedings of the annual ACM conference on Human Factors in Computing Systems* (Paris, France, April 27 - May 2, 2014). CHI '13. ACM, New York, NY. 2185 - 2194.

[2] **Laput, G.**, Lin, Y., Linnemeier, M., Vijjapurapu, R. 2012. StoryCubes: Connecting Elders in Independent Living Through Storytelling. In *Proceedings of the annual ACM conference on Human Factors in Computing Systems* (Austin, Texas, May 5 - 10, 2012). CHI '12. ACM, New York, NY. 1321 - 1326.

[1] **Laput, G.**, Adar, E., Dontcheva, M., Li, W. 2012. Tutorial-Based Interfaces for Cloud-Enabled Applications. In *Proceedings of the annual ACM Symposium on User interface software and technology* (Cambridge, Massachusetts, October 7 - 10, 2012). UIST '12. ACM, New York, NY. 113 - 122.

SELECTED WORKSHOPS AND DEMOS

[4] Yeo, H.S., **Laput, G**., Gillian, N., Quigley, A. 2017. Workshop on Object Recognition for Input and Mobile Interaction. In *Proceedings of the 19th International Conference on Human-Computer Interaction with Mobile Devices and Services* (Vienna, Austria, September 4 - 7, 2017). MobileHCI '17 Workshop.

[3] **Laput, G**., Zhang, Y., Harrison, C. 2017. Synthetic Sensors: Towards General-Purpose Sensing. In *Proceedings of the 2017 ACM annual conference on Human Factors in Computing Systems* (Denver, Colorado, May 6 - 11, 2017). CHI '17 Demos.

[2] Gleason C., Guo, A., **Laput, G**., Kitani, K., Bigham, J.P.. 2016. VizMap: Accessible Visual Information Through Crowdsourced Map Reconstruction In Proceedings of the 18th International ACM SIGACCESS Conference on Computers and Accessibility. ASSETS '17 Workshop.

[1] **Laput, G.**, Brockmeyer, E., Hudson, S.E., Harrison, C. 2015. Acoustruments: Passive, Acoustically-Driven, Interactive Controls for Handheld Devices. In *Proceedings of SIGGRAPH EMerging Technologies* (Los Angeles, CA, August 9 - 13, 2015). SIGGRAPH EmTech '15.

SELECTED INVITED PRESENTATIONS

University of Chicago CS (Chicago, IL) April 2019
Context-Driven Implicit Interactions

Microsoft Research (Redmond, WA) March 2019
Context-Driven Implicit Interactions

Cornell University CIS (Ithaca, NY) March 2019
Context-Driven Implicit Interactions

Massachussets Institute of Technology EECS (Cambridge, MA) Feb 2019
Context-Driven Implicit Interactions

University of California - Berkeley EECS (Berkeley, CA) Feb 2019
Context-Driven Implicit Interactions

Yale University CS (New Haven, CT) Feb 2019
Context-Driven Implicit Interactions

University of Wisconsin CS (Madison, WI) Feb 2019
Context-Driven Implicit Interactions

University of California - Los Angeles CS (Los Angeles, CA) Jan 2019
Context-Driven Implicit Interactions

University of Michigan EECS (Ann Arbor, MI) Jan 2019
Context-Driven Implicit Interactions

Apple AI and Machine Learning (Seattle, WA) Jan 2019
Context-Driven Implicit Interactions

Apple Hardware, Apple Core Audio (Cupertino, CA) Jan 2019
Making Ubiquitous Contextual Sensing More Practical

American Express User Experience and AI Group (New York, NY) Oct 2018
Making Ubiquitous Contextual Sensing More Practical

Adobe Research, Creative Technologies Group (Seattle, WA) Jun 2018
Making Ubiquitous Contextual Sensing More Practical

University of California - San Diego, HCI / Design Lab (San Diego, CA) May 2018
Practical Ubiquitous Contextual Sensing

Qualcomm, HCI Invited Speaker (San Diego, CA) May 2018
Practical Ubiquitous Contextual Sensing

Snap Research, Invited Speaker (Santa Monica, CA) May 2018
Practical Ubiquitous Contextual Sensing

TechConnect World Sensors Symposium, Keynote Panels (Anaheim, CA) May 2018
Practical Ubiquitous Contextual Sensing. w/ Joe Paradiso, MIT Media Lab

McGinnis Venture Capital Competition, Tepper School of Business (Pittsburgh, PA) Apr 2018
Zensors: Sensing Unleashed

University of Michigan, Interactive and Social Computing Seminar Series (Ann Arbor, MI) Mar 2018
Unleashing Ubiquitous, Unobtrusive, and More Practical Contextual Sensing

Pittsburgh City Council, PGH Labs 2.0 Invited Speaker (Pittsburgh, PA) Dec 2017
Zensors: Sensing Unleashed

ACM SIGGRAPH 2017, UIST Reprise Invited Speaker (Los Angeles, CA) Aug 2017
ViBand: High-Fidelity Bio-Acoustic Sensing Using Commodity Smartwatch Accelerometers

Magic Leap, Magic Leap Research, Invited Speaker (Seattle, WA) Jun 2017
Synthetic Sensors: Towards General-Purpose Sensing

EMPLOYMENT EXPERIENCE

Carnegie Mellon University, School of Computer Science — Aug 2013 - Present
Graduate Student Researcher – Human-Computer Interaction Institute
Faculty Collaborators: Chris Harrison, Scott Hudson, Jeff Bigham, and Anind Dey. Exploring novel sensing, display, and interaction techniques for smart environments and devices.

Apple — Oct 2018
Exploratory Design Group (XDG)
Project scope undisclosed at the moment.

Microsoft Research — Jun 2017
Research Intern. Natural Interactions Group. Supervisors: Ken Hinckley, Bill Buxton.
Project scope undisclosed at the moment.

Google Research — Jun 2015
Research Intern. Collaborators: Alex Kauffman (Advanced Interaction Research), Murphy Stein (Daydream), Emre Karagozler (ATAP), Ivan Poupyrev (ATAP). Novel sensing and haptics.

Disney Research / Walt Disney Imagineering — Jun 2014
Research Associate. Collaborators: Alanson Sample, Eric Brockmeyer, Elizabeth Carter, Chris Harrison, and Scott Hudson. Exploring novel sensing, hardware, and fabrication techniques for interactive systems and devices. Multiple publications.

University of Washington, Computer Science and Engineering, DUB Group — Jun 2013
Visiting Researcher – Computer Science and Engineering, Seattle, Washington
Mentors: James Fogarty and Morgan Dixon. Examined runtime enhancement and modeling of user interface widget state and style using pixel-based reverse engineering. Summer research work resulted in a publication.

Adobe Research — Jun 2012
Research Intern – Adobe Research, San Francisco, CA
Mentors: Mira Dontcheva, Gregg Wilensky and Aseem Agarwala. Examined novel multimodal interaction techniques for Photoshop and other Creative Suite products. Summer work resulted in a publication, and was demoed live at Adobe Tech Summit.

Past Employment, Volunteer, and Internships
Ford Motor Company, *Mobile Computing, Researcher*, Dearborn, MI — Aug 2009

ACADEMIC SERVICE

Editor-in-Chief, ACM XRDS Magazine
Program Committee, Co-Chair, ACM UIST 2020 Demos
Program Committee, Associate Chair (AC), ACM CHI 2020 Papers and Notes
Program Committee, Co-Chair, ACM UIST 2019 Demos
Program Committee, Associate Chair (AC), ACM UIST 2019 Papers and Notes
Program Committee, Associate Chair (AC), ACM CHI 2019 Papers and Notes
Program Committee, Associate Chair (AC), ACM UIST 2018 Papers and Notes
Program Committee, Associate Chair (AC), ACM CHI 2018 Papers and Notes
Program Committee, Co-Chair, ACM UIST 2018 Student Innovation Contest (SIC)
Program Committee, Co-Chair, ACM UIST 2017 Student Innovation Contest (SIC)
Program Committee, Workshop Organizer, ACM MobileHCI 2017
Program Committee, Associate Chair (AC), ACM CHI 2017 Late Breaking Work
Program Committee, Associate Chair (AC), ACM CHI 2016 Late Breaking Work
Session Chair, ACM UIST 2018 Session on Sensing at the Small Scale
Session Chair, ACM CHI 2018 Session on Sensing and Tangibles
Session Chair, ACM CHI 2017 Session on Sensing and Input
Faculty Hiring Committee, 2017 Cycle, Carnegie Mellon University, Human-Computer Interaction Institute
Reviewer (100+ papers): ACM CHI ’13 ’14 ’15 ‘16 ‘17 ‘18 ‘19, ACM UIST ’14 ‘15 ‘16 ‘17 ‘18 ‘19, ACM UbiComp ’15 ‘16 ‘17 ‘18 ‘19

TEACHING EXPERIENCE

Teaching Assistant, Carnegie Mellon University — Spring 2016
Designing Human-Centered Systems *(Undergraduate)*

Teaching Assistant, Carnegie Mellon University — Fall 2015
User-Centered Research and Evaluation *(Graduate)*

Teaching Assistant, University of Michigan — Fall 2012
Fundamentals of Human Behavior *(Graduate)*

Teaching Assistant, University of Michigan — Fall 2008
Introduction to Programming *(Undergraduate)*

Invited Guest Lectures
Pervasive and Ubiquitous Computing (invited by Mayank Goel) — Fall 2017
Software Systems for User Interfaces, "New Fabrication Technologies" (invited by Anind Dey) — Fall 2015
Designing Human-Centered Systems, "Low-fi Prototyping" (invited by Chris Harrison) — Fall 2015
Electronics Prototyping Workshop (invited by Chris Harrison) — Fall 2014

STUDENTS MENTORED

Evi Bernitsas, Undergraduate, CMU Computer Science (Now at Apple) — 2018
Richard Kang, Masters, Computational Design (Currently at CMU) — 2018
Jason Wu, Ph.D., Human-Computer Interaction (Currently at CMU) — 2018
Karan Ahuja, Ph.D., Human-Computer Interaction (Currently at CMU) — 2017
Saiganesh Swaminathan, Ph.D., Human-Computer Interaction (Currently at CMU) — 2017
Liang He, Masters, Tangible Interaction (Currently Ph.D. at University of Washington) — 2016
Yang Zhang, Masters, Tangible Interaction (Currently Ph.D. at CMU) — 2015
Ishan Chatterjee, Undergraduate, Harvard Electrical Engineering (Now at Microsoft) — 2014

SELECTED PRESS COVERAGE

TechCrunch, This Robot Uses Lasers to 'Listen' to the Environment — 10/2018
The Register (UK), Alexa heard what you did last summer– AI Recognizes Activities from Sound — 10/2018
Science Daily, Sound, Vibration Recognition Boost Context-Aware Computing — 10/2018
Futurity, Sound and Vibrations Let Smart Devices Know Where They Are — 10/2018
R&D Magazine, New Techniques Help Smart Devices Detect What's Happening — 10/2018
Google AI Blog, Announcing the 2018 Google PhD Fellows for North America, Europe and the Middle East — 4/2018
Pittsburgh Business Times, AI Startup wins McGinnis Venture Competition — 4/2018
Bloomberg: Innovator Profile, Gierad Laput: This Cracker-Size Sensor Can Tell You Which Oven Burner You Left On — 9/2017
NPR All Tech Considered, Our Homes May Get Smarter, But Have We Thought It Through? — 8/2017
NPR (WESA FM), CMU Grad Students' Universal Sensor Could Make The Internet Of Things Cost Less And Do More — 7/2017
WIRED, Your Camera Wants to Kill the Keyboard — 5/2017
MIT Technology Review, This Mega-Sensor Makes the Whole Room Smart — 5/2017
The Wall Street Journal, How to turn anything into a touchpad — 5/2017
TechCrunch, Google-funded 'super sensor' project brings IoT powers to dumb appliances — 5/2017
Uproxx, A New Gadget Can Make Your Home 'Smart' Without Replacing Anything — 5/2017
COMPUTERWORLD, Google, A.I. and the rise of the super-sensor — 5/2017
Android Authority, This could turn your entire home into a smart home with a simple click — 5/2017
Discovery Channel, Turn Anything into a Touchscreen With 'Electrick' — 5/2017
Engadget, A smart home mega sensor can track what goes on in a room — 5/2017
Digital Trends, Synthetic Sensors create a connected home without adding smart devices — 5/2017
Futurism, A New "Mega-Sensor" Could Make Your Entire Home Smart — 5/2017
The Verge, Electrick lets you spray touch controls onto any object or surface — 5/2017
NPR (WESA FM), CMU Researchers Find If You Can Paint It, You Can Make It A Touch Screen — 5/2017
Engadget, Get ready to 'spray' touch controls onto any surface — 5/2017
Popular Mechanics, High-Tech Spray Paint Can Make Anything Into a Touchscreen — 5/2017
TechCrunch, New technique turns anything into a touch sensor — 5/2017
Daily Mail, Graffiti goes hi-tech: Radical spray paint can turn ANYTHING into a touchpad — 5/2017
MIT Technology Review, A Cheap, Simple Way to Make Anything a Touch Pad — 5/2017

Gizmodo, Scientists Figure Out How to Turn Anything Into a Touchscreen Using Conductive Spray Paint	5/2017
Newsweek, Conductive Spray Paint Can Turn Any Surface Into a Touchscreen	5/2017
CNET, Turn Anything into a Touchscreen With 'Electrick'	5/2017
New Scientist, Spray-on touch controls give an interactive twist to any surface	5/2017
TechCrunch, How a tap could tame the smart home	5/2017
The Verge, Someday we might be able to use smart gadgets through electromagnetic emissions	5/2017
New Atlas, Single Synthetic Sensor keeps watch over entire room	5/2017
MIT Technology Review, Home Assistants Like Amazon Echo Could Be a Boon for Assisted Living	2/2017
Fast Company, A Smartwatch That Recognizes What You Touch	11/2016
TechCrunch, Overclocked Smartwatch Sensor Uses Vibrations to Sense Gestures, Objects and Locations	11/2016
Gizmodo, Brilliant Mod Makes Smartwatches Actually Useful	11/2016
Yahoo! News, A hacked smartwatch can tell what your hands are doing, holding or touching	11/2016
The Verge, Carnegie Mellon researchers hacked an LG smartwatch to turn it into a gesture device	11/2016
Digital Trends, Ingenious accelerometer hack could allow existing smartwatches to identify any object that you grab	11/2016
Fast Company, The Most Innovative Student Design of 2016	9/2016
Scientific American, Maker Movement Turns Scientists into Tinkerers	8/2016
NPR Radio Broadcast (Via WESA 90.5FM), "CMU's SkinTrack Technology Turns Your Forearm Into Smartwatch Trackpad"	6/2016
MIT Technology Review, "Use Your Arm as a Smart Watch Touch Pad"	5/2016
The Verge, "New Tech Turns Your Skin into a Touchscreen for your Smartwatch"	5/2016
Huffington Post, "New Tech Turns Your Arm Skin Into A 'Touchpad'"	5/2016
CNN, "This Watch Turns Your Arm into a Touchscreen"	5/2016
Newsweek, "Smart Ring Turns Your Skin into a Touchpad for your Smartwatch"	5/2016
Yahoo! News, "SkinTrack Turns Your Whole forearm into a Smartwatch Interface"	5/2016
WIRED, "SkinTrack Can Turn Your Skin into a Touchscreen"	5/2016
TechCrunch, "Want More Screen Space on Your Smartwatch? Put a ring on it…"	5/2016
The Daily Mail (UK), "Frustrated with Tiny Smartwatch screens? Gadget Turns the Skin into a Touchpad"	5/2016
Popular Science, "This Smartwatch Turns Your Skin into a Touch Screen"	5/2016
Inverse, "Carnegie Mellon Can Turn Your Beautiful Skin into a Vast Smartwatch Trackpad"	5/2016
Gizmodo, "This New 'Skinterface' Could Make Smartwatches Suck Less"	5/2016
Engadget ,"Navigate your Smartwatch by Touching Your Skin"	5/2016
Mashable, "Researchers Create Wild Skin-Touch Interface for Tiny Smart Watches"	5/2016
Maxim, "This Freakishly Futuristic Technology Lets You Use Your Skin as a Touchscreen"	5/2016
Discovery Channel, "Your Arm Could be the Touchpad"	5/2016
Phys.org ,"SkinTrack Technology Turns Arm into Smartwatch Touchpad"	5/2016
Tech Times, "Fingertips Too Big For Your Tiny Smartwatch? SkinTrack Turns Your Forearm Into A Touchpad"	5/2016
R&D Magazine, "Engineers Create Tool That Turns Skin into Touchpads"	5/2016
PC Magazine, "'SkinTrack' Turns Your Arm Into a Touch Screen"	5/2016
R&D Magazine, "SweepSense Pauses Your Music When Earphones are Removed"	2/2016
MIT Technology Review, "Pause Your Tunes by Taking Out Your Earbuds"	2/2016
NPR (WESA 90.5 FM, Radio Broadcast), "CMU Technology Syncs Smart Watch User's Actions With Helpful Apps"	11/2015
BBC News, Click (TV Programme, Aired Live), "The Smartwatch Gets Serious"	11/2015
NBC News, "Disney Smartwatch Knows What You're Touching and Tells You What to Do Next"	11/2015
CBS (KDKA-FM 93.7 Pittsburgh Radio Interview), "A Smartwatch that Knows What You're Touching"	11/2015
Discovery Channel (Canada) Live Broadcast, "Smartwatch Turns Your Body into an Antenna"	11/2015
Ars Technica, "Disney's smartwatch prototype can identify and track everything you touch"	11/2015
VICE Motherboard, "Disney Designed a Smartwatch that Knows What You're Touching"	11/2015
WIRED, "EM-Sense Enabled Smartwatch Can Detect When You Touch a Doorknob"	11/2015
Popular Mechanics, "Disney's Wild New EMSense Tech Can Identify Any Gadget You Touch"	11/2015
Discovery News, "Smartwatch Turns Your Body into an Antenna"	11/2015
Daily Mail (UK), "EM-Sense knows what you're touching and shows relevant information on its display"	11/2015
WIRED (UK), "Disney's concept smartwatch knows what you're touching"	11/2015
CNET (Japan), "EMSense identifies the type of electronic device you're touching"	11/2015
Gizmodo, "Your Smartwatch Might Soon Know Exactly What You're Touching"	11/2015
Fast Company, "This $10 Hack Could Let Your Apple Watch Sense Everything You Touch"	11/2015
New Scientist, "No-touch smartwatch scans the skin to see the world around you"	11/2015
Hacker News (Front Page), "Disney's EM-Sense Smartwatch, contextually determining what you're touching"	11/2015
Digital Trends, "Armed with electromagnetic sensors, Disney's new wearable can tell what you're touching"	11/2015
Tech Spot, "This smartwatch uses electromagnetic noise to identify what you're touching"	11/2015
Hack A Day, "Disney's Designing a Smartwatch that Knows What You're Touching"	11/2015
Tech Radar, "Disney made a smartwatch that tells you what you're touching"	11/2015
Tech Times, "Recognition Software Could Let Smartwatches Enable Context-Aware Apps"	11/2015
Phys.org, "System recognizes objects touched by user, enabling context-aware smartwatch apps"	11/2015
TechCrunch, "Researchers Can Now Create 3D-Printed (Plastic) Hair"	11/2015
Fast Company, "This Delicate Hair Is Artisan-Level 3-D Printing"	11/2015
Business Insider, "You can now use a 3-D printer to create artificial hair"	11/2015
Cosmopolitan (UK), "You Can Now 3-D Print Hair"	11/2015

Marie Claire, “3-D Printers Are Now Making Hair: Is This the Future of Extensions?” 11/2015
Hack A Day, “Hair Enthusiasts Rejoice! Synthetic Follicles are Now 3D-Printable” 11/2015
Pittsburgh Post-Gazette, “CMU researchers develop technique for printing hair strands” 11/2015
Discovery Channel (Canada) Live Broadcast, “Furbrication” 11/2015
MIT Technology Review, “You Can Now 3-D Print a Toupee” 11/2015
New York Magazine, “So Long, Weaves. 3-D Printers Can Now Make Hair” 11/2015
CBS (Pittsburgh), “Carnegie Mellon Researchers Create ‘Hair’ With 3-D Printer” 10/2015
NPR (WESA 90.5 FM Radio Broadcast), “Bad Hair Day? Try Printing It Instead” 10/2015
CNET, “3D-printed hair puts a coiffure on your plastic creations” 10/2015
Engadget, “3D printing hair is as easy as using a hot glue gun” 10/2015
Gizmodo, “Sorry, Hair Club—We Can Finally 3D-Print Hair” 10/2015
Phys.org, “Research team fur-bricates hair with inexpensive 3-D printer” 10/2015
Tech Times, “Researchers Use Hot Glue Gun Technology to Create 3D-Printed Hair Strand By Strand” 10/2015
International Business Times, “Sorry, Hair Club—We Can Finally 3D-Print Hair” 10/2015
CMU Link, “Acoustruments: Adding new functionality to smartphones by harnessing the power of sound” 10/2015
WIRED, “There’s a Way to Control Phones With Sound, Not Electronics” 10/2015
TechCrunch, “Disney’s Lab Builds Buttons That Work By Manipulating Soundwaves Rather Than Electricity” 7/2015
IEEE Pervasive Mag, “Acoustruments: Passive, Acoustically-Driven Interactive Controls for Handheld Devices” 5/2015
Fast Company, “Disney’s Incredible iPhone Accessories Can Hear How You Touch Them” 4/2015
Gizmodo, “Disney Invented a Way To Control Your Phone Using the Sounds It Emits” 4/2015
Mashable, “Researchers use sound waves to control iPhones” 4/2015
Engadget, “Disney’s ‘acoustruments’ can control phones using their own sounds” 4/2015
PCWorld, “Weird Disney tech lets you play Pied Piper to your smartphone” 4/2015
Phys.org, “Beyond the touchscreen: Researchers develop acoustically driven controls for smartphones” 4/2015
TechSpot, “Disney is using ultrasonic sound-waves to develop next generation smartphone accessories” 4/2015
Science Daily, “Acoustically driven controls created for smartphones” 4/2015
WIRED, “Human Smarts Plus AI Could Unlock Computer Vision” 4/2015
PCWorld, “Zensors app lets you crowdsource live camera monitoring” 4/2015
Digital Trends, “Zensors app uses your old smartphone and crowdsourcing for smart surveillance” 4/2015
Gizmodo, “One Old Android Phone Could Make All Your Dumb Things Smart” 4/2015
Engadget, “Scientists turn old smartphones into all-seeing eyes” 4/2015
SlashGear, “Zensors wants to make dumb stuff smart in your home” 4/2015
Gizmodo, “The 7 Most Important UI and UX Ideas of 2014” 4/2015
New York Times, “In a Small Space, a Big Issue: Researchers Look at Ways to Fit Technology in Confined Spaces” 12/2014
TechCrunch, “Skin Buttons Are Working Buttons Projected Onto The Skin” 11/2014
WIRED, “A Smartwatch That Projects Buttons Onto Your Skin” 10/2014
Fast Company, “This Smartwatch Projects Laser Buttons Onto Your Skin” 10/2014
New Scientist, Magazine Issue #2991 (UK), “Skin buttons expand smartwatches” 10/2014
Gizmodo, “7 Experimental Interfaces That Show the Future of UI Design” 10/2014
Canadian Broadcasting Company (CBC), “Skin Buttons”, Live Broadcast 10/2014
NEXT Pittsburgh, “How Apple botched the watch and why Skin Buttons will be better” 10/2014
IEEE Spectrum, “Wearable Computers Will Transform Language” 10/2014
WIRED, “ Hardware Whizzes Solve a Big Smartwatch Problem: Your Fat Fingers” 9/2014
MIT Technology Review, “A Smart Watch Controlled by Twists, Tilts, and Clicks” 5/2014
Daily Mail (UK), “Time to play! The twistable smartwatch that doubles up as a JOYSTICK” 5/2014
The Economic Times (India), “How a joystick could iron out kinks in smartwatches” 5/2014
New Scientist, “Tilting smartwatch cuts need for fiddly screen-jabbing” 5/2014
Gizmodo, “A Joystick-Inspired Interface Could Solve Smartwatches’ Biggest Problem” 5/2014
Engadget, “Concept smartwatch uses the whole screen as a joystick” 5/2014
Hacker News (Front Page), “Joystick-like Input Method for Smartwatches” 5/2014
PCWorld, “Researchers try a new ‘twist’ on smartwatch control” 4/2014
Network World, “Researchers try new ‘twist’ on smartwatches” 4/2014
Kotaku, “Smartwatch Concept Brings DOOM To Your Wrist” 4/2014
Adobe.com Leaders: Breakthrough Innovation, “Tell an Image What to Do” 4/2014
SunStar (Philippines), “Cebuano student leads team behind voice-controlled photo editing app” 4/2014
Pestaola (Greece), “PixelTone app, το μέλλον της Apple και της Ελλάδας είναι multimodal” 4/2014
Tech Genius (Italy), “Adobe sta sviluppando un Photoshop a comandi vocali?” 4/2013
PCWorld (Bulgaria), “Скоро може да се появи графичен редактор с гласово и жестово управление” 3/2013
Pop Photo, “PixelTone: A Voice Controlled Photo Editing App for iPad” 2/2013
Tec Mundo (Brazil), “Adobe desenvolve editor de fotos que pode ser comandado por voz” 2/2013
Tom’s Guide,(France), “Adobe travaille sur une application de retouche photo à la voix” 2/2013
PetaPixel, “PixelTone: A Futuristic Image Editor That Lets You ‘Shop Photos Using Your Voice” 2/2013
Discovery Channel, Featured on the Daily Planet’s digit@l Segment 2/2013
Gizmodo, “Adobe’s Developing a Brilliant Photo Editing App You Can Just Talk To” 2/2013
NBC, “Voice-controlled photo app PixelTone: Shades of ‘Blade Runner’” 2/2013
Plus dozens more.

PATENTS ISSUED AND PENDING

Note: Patent author order is arbitrary and has no legal bearing.

[20] Agarwal Y., Harrison C., Laput, G., et. al.. 2018. Virtual Sensor System. U.S. Patent Application 15/961,537. Filed October 2018..

[19] Laput, G., Ahuja, K., Goel, M., Harrison, C. 2018. Ubicoustics: Plug-and-Play Acoustic Activity Recognition. U.S. Patent App. Filed June 2018.

[18] Laput, G., Harrison, C. 2018. Fine-Grained Activity Sensing Using Commodity Smartwatches. U.S. Patent App. Filed June 2018.

[17] Zhang, Y., Laput, G., Harrison, C. 2018. Vibrosight: Long-Range Laser Vibrometry for Activity Recognition. U.S. Patent App. Filed June 2018.

[16] Laput, G., Zhang Y., Harrison, C. 2016. Synthetic Sensors: System and Method Towards General-Purpose Sensing. U.S. Patent App. Filed September 2016.

[15] Zhang Y., Laput, G., Harrison, C. 2016. Electrick: Low-Cost Touch Sensing for Large, Irregular, Rapidly-Prototyped Objects. U.S. Patent App. Filed September 2016.

[14] Laput G., Xiao, R., Harrison, C. 2016. EMPower: Instant and Effortless Summoning of Rich Contextual Applications for Interface-Poor Smart Devices. U.S. Patent App. Filed April 2016.

[13] Laput G., Xiao, R., Harrison, C. 2016. System and Method for High-Fidelity Bio-Acoustic Sensing for Wearable Devices. U.S. Patent Application Filed April 2016.

[12] Laput G., Harrison C. 2016. Generalized Machine Learning and Signal Processing Pipeline for Time-Series Sensor Streams. U.S. Patent Application Filed April 2016.

[11] Laput, G., Xiao, R., Harrison, C. 2016. A system for Enabling Rich Contextual Applications for Interface-Poor Smart Devices. U.S. Patent Application Filed April 2016.

[10] Laput, G., Yang, C., Xiao, R., Sample, A., Harrison, C. 2015. Automatic Object Detection and State Estimation via Electronic Emissions Sensing. U.S. Patent Application Filed Oct. '15. US Patent Application Number 14/925,697. **Patent Issued.**

[9] Laput, G., Chen, X.A., Harrison, C. 2015. Fused Deposition Modeling of Strands, Fibers and Bristles. U.S. Patent Application Filed on Oct. '15.

[8] Yang, Z., Zhou, J., Laput, G., Harrison, C. Wearable Sensors for Continuous Finger Tracking on the Skin. U.S. Patent Application Filed Oct. '15.

[7] Laput, G., Lasecki W., Weise, J.W., Xiao, R., Bigham, J., Harrison, C. 2015. Zensors: Adaptive, Rapidly-Deployable, Human-Intelligent Sensor Feeds. U.S. Patent Application filed April 2015.

[6] Laput, G., Harrison, C., Hudson, S.E., Xiao, R., Chen, X.A. 2014. Cheap, Small, Low-Powered, Clickable Fixed-Icon Laser Projections. U.S. Patent Application 61/997,743 filed July 2014.

[5] Harrison, C., Hudson, S.E., Xiao, R., Laput, G. 2014. Expanding the Input Expressivity of Smartwatches with Mechanical Pant, Tilt, Twist, and Click. U.S. Patent Application 61/995,579 filed April 2014.

[4] Wilensky, G., Chang, W., Dontcheva, M., Laput, G., Agarwala, A. 2012. Natural Language Image Editing. U.S. Patent 13/683,278 filed Nov 21, '12. **Patent Issued**

[3] Wilensky, G., Chang, W., Dontcheva, M., Laput, G., Agarwala, A. 2012. Natural Language And User Interface Controls. U.S. Patent Application 13/683,341 filed Nov 21, 2012. **Patent Issued.**

[2] Wilensky, G., Chang, W., Dontcheva, M., Laput, G., Agarwala, A. 2012. Natural Language Image Spatial and Tonal Localization. U.S. Patent Application 13/683,416 filed Nov 21, 2012. **Patent Issued.**

[1] Wilensky, G., Chang, W., Dontcheva, M., Laput, G., Agarwala, A. 2012. Natural Language Image Tags. U.S. Patent 13/683,466 filed Nov 21, 2012. **Patent Issued.**

MISCELLANEOUS

Drummer, Disney Research Band (From Ottis Redding to Johnny Cash, to Adele and the Foo Fighters) 2014 - 2018
Running (Logged on Nike+) — 1000+ miles of running (and counting)
Steps (Logged on FitBit and Apple Watch) — Average 15K steps per day. Logged 9,000+ Lifetime miles (and counting)
Swimming (Logged on Apple Watch) — 18,450+ Yards (and counting)
Languages — Cebuano (Fluent), Tagalog (Fluent), English (Fluent, 3rd Language)

REFERENCES

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