

**Alexander Berman**  
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**Computer Scientist**  
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**Overview:** HCI Researcher with experience in machine learning, web design, and digital fabrication seeking employment – More Details at <https://Alexander-Berman.github.io>

## Experience

### **Intern at the U.S. Department of Defense** **Summers 2017 and 2018**

Analyzed associations between images and text in unstructured multimedia datasets (Darknet Markets and Wikipedia) by training (via transfer-learning) Convolutional Neural Networks to predict semantic embedding of source text associated with a given image. Helped develop visualizations for exploring these relations.

### **Research with Dr. Francis Quek** **2015 to Present**

Studying educational methods and tools used by people employing personal fabrication methods. Have done work investigating how students learn with Making-oriented classroom activities. Developing *HowDIY*, a website utilizing novel multi-modal (text, images, 3D files) search and recommender systems to introduce anyone to 3D Printing

### **Research with Dr. Emily Mower-Provost** **2013 to 2015**

Trained SVM Classifiers to determine speaker's Emotion in real-time with audio-video (webcam) data of speaker. Created real-time website to demonstrate Emotion Classification.

Coded Machine Learning Library and Tools for Intelligent Interactive Systems course.

### **John Deere - Moline, IL Headquarters** **Summer 2014**

Created low-cost distributed prototype Surveillance System on 6150R Tractor and other Farm Equipment by Integrating new Sensors and Processors into vehicle CAN buses.

Setup a server and simple phone application for farm supervisor to monitor fleet and receive security notifications.

### **Math Tutoring Center at Northwestern Michigan College** **Summer 2012**

## Education

### **Texas A&M - Computer Science PhD** **2015-Present**

All non-elective courses completed in addition to electives relating to HCI and Machine Learning.

Research with Dr. Francis Quek in TEILab relating to Embodiment Interaction, Education, and Digital Fabrication

### **University of Michigan – Computer Science BSE** **2011-2015**

Courses related to HCI, AI, and Robotics while researching with Dr. Emily Mower-Provost on Emotion Recognition

## Activities

### **UM::Autonomy** **2011-2015**

Electrical Team Leader (2013-2014): Assemble & Maintain onboard computer with sensors, work with embedded systems, and write Perception Software. Lead, Teach, and Supervise Multidisciplinary Team.

Design and code small fully-autonomous boat to navigate buoy course and perform various tasks.

2012 International AUVSI RoboBoat Competition Champions

### **IEEE-ACM** **2012-2015**

Department Relations Officer (2013-2014): organize events with Faculty in the Electrical Engineering and Computer Science department to improve collaboration between students and faculty. (Biweekly Meetings and Events)

### **Michigan Marching and Hockey Bands** **2011-2015**

Perform Tuba at all home and some away football and hockey games (~2 Hours a Day plus Games)

2014 Parkinson Michigan Marching Band Scholarship recipient

### **Boy Scouts of America Eagle Scout and Senior Patrol Leader** **2011**

## Skills

**Programming:** Python, Keras, JavaScript, HTML, CSS3, Bootstrap, Django, SQL, C/C++, Java, MATLAB

**Fabrication:** Simple Circuit Design, Microprocessor Utilization, 3D Printing, Laser Cutting, Power Tools

**Software:** Jupyter Notebook, PyCharm, Linux, XCode, Photoshop, Qt, CAD (Fusion 360), Cura, Three.js

- Berman, Alexander et al. “HowDIY: Introducing Anyone to 3D Printing Services through Online Computational Tools”. IEEE Pervasive Computing – Special Issue on Pervasive Manufacturing (pending)
- Mohanty, Ronak and Berman, Alexander et al. “Clock-Maker's Work-space: Investigating Spatial Object Manipulation in Peripersonal Space”. TEI 2020, ACM. (pending)
- Berman, Alexander and Quek, Francis. “ThingiPano: A Large-Scale Dataset of 3D Printing Metadata, Images, and Panoramic Renderings for Exploring Design Reuse”. IEEE BigMM (pending)
- Peña, Alexander and Berman, Alexander. “Visually Exploring Relationships Between Textual Embeddings, User Data, and Recommendations”. RecSys 2020, ACM. (pending)
- Berman, Alexander, et al. “Anyone Can Print”: Supporting Collaborations with 3D Printing Services to Empower Broader Participation in Personal Fabrication”. NordiCHI 2020, ACM. (pending)
- Osazuwa, Okundaye et al. “Investigating Telepresence Robotics for Supporting Hands-on Distance Instruction”. NordiCHI 2020, ACM (pending)
- Natarajarathinam, Malini, et al. “Making in The Colonias: Motivating STEM Participation through a Making as Micro-Manufacturing Model”. 127<sup>th</sup> Annual Conference for the American Society for Engineering Education (ASEE). 2020 (poster)
- Berman, Alexander and Paul, Celeste. “Making Sense of Darknet Markets: Automatic Inference of Semantic Classifications from Unconventional Multimedia Datasets”. HCII, Springer. 2019. **(Best Paper Award)**
- Nam, Beth, et al. “Towards the Meaningful 3D-Printed Object: Understanding the Materiality of 3D Prints”. HCII, ACM. 2019 (poster)
- Berman, Alexander, et al. “Proximal and Distal Mentors: Sustaining Making-Expertise in Rural Schools”. Fablearn 2019, ACM. NY, NY. 2019
- Natarajarathinam, Malini, et al. “Developing Communities of Practice through Peer Mentorship in Making through Micro Manufacturing Model”. 126<sup>th</sup> Annual Conference for the American Society for Engineering Education (ASEE). 2019
- Berman, Alexander, et al. “Exploring the 3D Printing Process for Young Children in Curriculum-Aligned Making in the Classroom”. IDC, ACM. 2018. (poster)
- Berman, Alexander, et al. "iCanTrace: Avatar Personalization through Selfie Sketches." WIP TTE. 2017 (poster)
- Okundaye, Osazuwa, et al. “Making to Micro-Manufacture: Catalyzing STEM Participation in Rural High Schools”. Fablean Europe, ACM. 2018.

- Chu, Sharon Lynn, et al. "Physical Making Online: A Study of Children's Maker Websites." *Proceedings of the 7th Annual Conference on Creativity and Fabrication in Education*. ACM, 2017.
- Chu, Sharon Lynn, et al. "Becoming Makers: Examining Making Literacy in the Elementary School Science Classroom." *Proceedings of the 2017 Conference on Interaction Design and Children*. ACM, 2017.
- Berman, Alexander, et al. "Toward a Making Community of Practice: The Social Aspects of Elementary Classroom-Based Making." *Proceedings of the 6th Annual Conference on Creativity and Fabrication in Education*. ACM, 2016.