Alexander Berman
Computer Scientist - PhD (Graduating Fall 2020)

Human-Computer Interaction (HCI) Researcher with experience in Machine Learning, Web Design, Robotics, andDigital Fabrication seeking employment **starting Winter 2020**

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Texas A&M, College Station 📍

alexander-berman.github.io 🌐

EDUCATION

Computer Science, PhD
Texas A&M University
2015 - Present

Computer Science, B.S.E.
University of Michigan
2011 - 2015

WORK EXPERIENCE

Graduate Research Assistant
Texas A&M University with Dr. Francis Quek
2015 - Present
Achievements/Tasks

- Developed and Publishing with**HowDIY**, a website guiding printing-newcomers' first-steps in 3D printing by recommending personally-relevant online resources to help specify first prints
- Scraped, Cleaned, and Published large dataset **ThingiPano** for training multi-modal (text, images, 3D renders) machine learning methods for facilitating 3D design-reuse in digital fabrication
- *Leads and Mentors*design and fabrication of STEM education-kits, proximally and *over the interne*t, with multiple large *Multi-Disciplinary Teams (many publications from Education to ACM-venues)*

Computer Science Summer Intern
U.S. Department of Defense
2017 - 2018
Achievements/Tasks

- **Best Paper** winning (HCII) machine learning methodology and analysis of unstructured multimodal data (DarkNet)
- Invented Novel NLP Algorithms for Combining N-Grams
- Developed Visualizations for understanding unstructured multi-modal (text, meta-data, images) Datasets

Summer Intern
John Deere Headquarters
2014
Achievements/Tasks

- Developed Farm Fleet Surveillance System to send phone-notifications to fleet-owners about theft
- Enhanced 6150R Tractor and other equipment by integrating various sensors and processors (RaspPi and Arduino) with CAN busses

Undergraduate Researcher
University of Michigan with Dr. Emily Mower Provost
2013 - 2015
Achievements/Tasks

- Trained SVM to classify emotion from real-time webcam data
- Created framework for training and deploying similar models

SKILLS

python | keras | Jupyter Notebook
django | html | bootstrap | C/C++
Java | Matlab | javascript | Circuits
Micro-Processors | Laser Cutting
3D Printing | CAD (Fusion 360) | Making

HIGHLIGHTED PUBLICATIONS

"ThingiPano" IEEE BigMM 2020
- A large multimodal dataset of metadata, images, and 3D renderings to support analysis and machine learning tools supporting design-reuse (examples online)

"Anyone Can Print" ACM NordiCHI 2020
- Human Studies surrounding how newcomers may be introduced to 3D printing through computational tools

"Making Sense of Darknet Markets" HCII 2019
- **Best Paper Award**- novel analysis of Darknet marketplace listings with self-supervised machine learning methods

"Proximal and Distal Mentors" FabLearn 2019
- Explored methods for how to sustainably teach hands-on multidisciplinary lessons from a distance over Skype

ORGANIZATIONS

ACM SIGCHI Student Chapter (2018 - Present)

UM::Autonomy (2011 - 2015)
*Design and Code autonomous boats in MultiDisciplinary team to navigate obstacle courses -***Electrical Team Lead,***AUVSI RoboBoat Competition Champions*

IEEE-ACM Student Chapter (2011 - 2015)
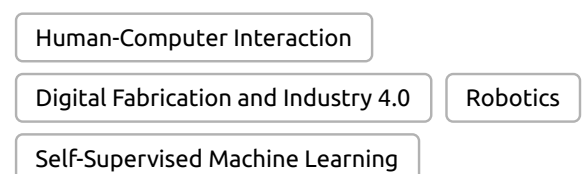**Department Relations Officer -** *Organized Academic Events*

Michigan Marching and Hockey Band (2011 - 2015)
*Practice and Perform Tuba in front of many large audiences -***2014 Parkinson Michigan Marching Band Scholarship**

Tutor at Northwestern Michigan College (2012)

Boy Scouts of America Eagle Scout and Senior Patrol Leader (2011)

INTERESTS

Human-Computer Interaction

Digital Fabrication and Industry 4.0 | Robotics

Self-Supervised Machine Learning

Publications

Mohanty, Ronak, Alexander Berman, Shinjiro Sueda, Francis Quek, Vinayak Krishnamurthy. "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 2020

Berman, Alexander, Osazuwa Okundaye, Francis Quek, Jay Woodward, Jeeeun Kim. "Anyone Can Print": Supporting Collaborations with 3D Printing Services to Empower Broader Participation in Personal Fabrication". NordiCHI 2020, ACM.

Osazuwa, Okundaye, Sharon Chu, Francis Quek, Alexander Berman, Glen Hordemann, Larry Powell, Leming Yang. "Investigating Telepresence Robotics for Supporting Hands-on Distance Instruction". NordiCHI 2020, ACM.

Natarajarathinam, Malini, et al. "Making in The Colonias: Motivating STEM Participation through a Making as Micro-Manufacturing Model". 127th 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, Alexander Berman, Brittany Garcia, Sharon Chu. "Towards the Meaningful 3D-Printed Object: Understanding the Materiality of 3D Prints". HCII, ACM. 2019 (poster)

Berman, Alexander, Sharon Chu, Francis Quek, Osazuwa Okundaye, Leming Yang, Beth Deuermeyer, Enrique Berrios, Skylar Deady, and Jessica Doss. "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". 126th Annual Conference for the American Society for Engineering Education (ASEE). 2019

Berman, Alexander, Elizabeth Deuermeyer, Beth Name, Sharon Chu, Francis Quek. "Exploring the 3D Printing Process for Young Children in Curriculum-Aligned Making in the Classroom". IDC, ACM. 2018. (poster)

Okundaye, Osazuwa, Sharon Chu, Francis Quek, Alexander Berman, Malini Natarajarathinam, Matthew Kuttolamadom. "Making to Micro-Manufacture: Catalyzing STEM Participation in Rural High Schools". Fablean Europe, ACM. 2018.

Berman, Alexander, Leela Krishna Chaitanya Gottumukkala, Zepeng Huo, Seth Posley, Francis Quek, and Tracy Hammond. "iCanTrace: Avatar Personalization through Selfie Sketches." WIPTTE. 2017 (poster)

Chu, Sharon Lynn, Francis Quek, Sourabh Bhangaonkar, and Alexander Berman. "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, Elizabeth Deuermeyer, Rachel Martin, Francis Quek, Alexander Berman, Mario Suarez, Niloofar Zarei, Beth Name, and Colin Banigan. "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, Brittany Garcia, Beth Nam, Sharon Chu, Francis Quek. "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.