Meredith Young-Ng

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Education

Brown University, Providence, RI — *2019 – 2021*
M.S., Computer Science
GPA: 4.0

Cornell University, Ithaca, NY — *2016 – 2019*
B.S., Computer Science, *cum laude*
Minor in Information Science
GPA: 3.74

Research Experience

Brown University HCI Lab, *Research Assistant* — *Aug. 2019 – Present*
Mentor: Jeff Huang

- Currently working on a smartphone AR method that uses mid-air hand gestures to recreate dynamic virtual object animation motions, enabling users to view AR animations during animation authoring with storyboarding applications
- Designed and fabricated a hand-mounted wearable display with a Raspberry Pi and OLED screen that expands the free-hand interaction region for Portalware, a smartphone-wearable AR mid-air 3D sketching system; implemented 3D sketch editing tools with Unity and C#
- Assisted with autobiographical design evaluation for Portalware system; contributed to full paper submission
- Ran pilot study for Throwable, a projectile-based adaptive throwing model with free-hand manipulation in smartphone AR; contributor to upcoming paper submission

Brown University Visual Computing Lab, *Research Assistant* — *Sept. 2020 – Present*
Mentor: James Tompkin

- Currently working on a real-time amortized deep view synthesis method to learn depth and disocclusions for VR, using layered multi-sphere images from 6DoF omnidirectional stereo (ODS) video with Tensorflow

GE Research, *Edison Program Intern - Technical Research* — *June – Sept. 2020*
Mentors: Shaopeng Liu and Masako Yamada (Software & Analytics Group)

- Designed and implemented analytical tool to classify electric breaker faults using RTDS simulated phasor measurement (PMU) time series data; developed two new multi-PMU feature embedded image encoding approaches with Python
- Trained MLP and FCN models with PMU image encoding inputs with Tensorflow, achieving >99% accuracy
- Contributed to upcoming external paper submission for CNNs with PMU situational awareness

Cornell University Graphics & Vision Lab, *Research Assistant & Summer 2018 REU* — *May 2018 – Aug. 2019*
Mentors: Steve Marschner and François Guimbretière

- Simulated a 3D knitting machine (CrochetMatic) by constructing 3D stitch mesh-like polyline block models in Blender and a pipeline to convert these models into B-splines for simulator input
- Built a GPU cloth rendering pipeline to simulate input knitting patterns, generating images of fabric throughout simulation

Publications

Portalware: Exploring a Mid-Air Sketching Paradigm with Smartphone-Wearable Free-Hand Manipulation
Jing Qian*, **Meredith Young-Ng***, Tongyu Zhou, Angel Cheung, Xiangyu Li, Ian Gonsher, and Jeff Huang
Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems (under review)

Portalware: A Smartphone-Wearable Dual-Display System for Expanding the Free-Hand Interaction Region in Augmented Reality
Jing Qian, **Meredith Young-Ng**, Xiangyu Li, Angel Cheung, Fumeng Yang, and Jeff Huang
Extended Abstracts of the 2020 CHI Conference on Human Factors in Computing Systems (CHI LBW)

Honors & Awards

GHC 2020 Student Scholarship *September 2020*
CRA-WP Grad Cohort for Women 2020, Invitation & travel grant (postponed to 2021) *April 2021*
Cornell Engineering Dean's List *Fall 2016 – Spring 2017, Spring 2018 – Spring 2019*
Shell Eco-Marathon Americas 2018, 5th place *April 2018*

Other Experience

Cornell University Resistance Racing, *Software Developer* *Sept. 2016 – Sept. 2018*

- Designed, tested, and implemented data acquisition system for the team's battery electric vehicle using the Particle Electron and a Raspberry Pi to handle I^2C, SPI, and UART communications with the battery management system, motor controller, and sensors to send data to the Particle Cloud
- Programmed CANBUS communications system for electrical systems in the team's 2016 electric motorcycle

Teaching Experience

Brown University, *Teaching Assistant*

- CSCI 1290: Computational Photography and Image Manipulation *Fall 2020*
- CSCI 1951-C: Designing Humanity Centered Robots (*Head Teaching Assistant*) *Fall 2019*

Cornell University, *Teaching Assistant*

- CS 4820: Introduction to Analysis of Algorithms *Spring 2019*
- CS 4620: Introduction to Computer Graphics *Fall 2018*

Stanford iD Tech Camps, *Instructor*

- Introduction to Java Coding *Summer 2017*

Projects

SurfaceBrush *Spring 2020*
Re-implemented SurfaceBrush, a method for manifold mesh reconstruction from VR 3D brush strokes [Rosales et al., SIGGRAPH 2019] with 3 other team members. Implemented the Viterbi algorithm for vertex matching, mesh strip generation, closing the gaps, and boundary and Laplacian smoothing in C++ with Qt.

Path Tracer *Spring 2020*
Built a physically realistic CPU path tracer in C++ with Qt. Implemented soft shadows, indirect illumination, Russian Roulette path termination, and event splitting with ideal diffuse, glossy specular, ideal specular (mirror), and dielectric refraction BRDFs. Includes stratified sampling and BRDF importance sampling.

Tile Tunes *Fall 2018*
Designed and fabricated a line tracking robot that plays musical compositions mapped from colored tiles with 2 team members. Implemented colored tile detection, OLED graphics, and audio through I^2C, SPI, and UART using an Adafruit Feather M4.

Service

Brown University

CS Diversity Committee, *Member* — *Mar. 2020 – Present*
RISD | Brown Design for America, *Closing the Gender Gap in CS Team Member* — *Sept. 2019 – Present*

Cornell University

Cornell Alumni Admissions Ambassador Network (CAAAN), *Member* — *Sept. 2019 – Present*
Diversity Programs in Engineering, *CURIE Academy Program Assistant* — *July 2019*
College of Engineering, *Engineering Peer Advisor* — *Mar. 2017 – May 2019*
Diversity Programs in Engineering, *CURIE Academy Volunteer* — *July 2018*
Society of Women Engineers, *Community Outreach Chair* — *Sept. 2017 – Sept. 2018*
Society of Women Engineers, *High School Outreach Chair* — *Sept. 2016 – Sept. 2017*

Skills

Programming Languages: Python, C++, Java, Javascript, HTML, CSS, C, R, MATLAB, LaTeX
Software: Autodesk Maya, Adobe Suite (Photoshop, Illustrator, Adobe XD)
Fabrication: CAD (Fusion 360), 3D Printing, Laser Cutting, Microcontrollers
Interests: Violin, Chamber Music, Piano, Electric Cars, Creative and Expository Writing