Ermal Dreshaj

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Profile

Driven by the curiosity of technology that makes us go “wow!”, my skill set spans a breadth of experience and interests lying at the intersection of user experience, core engineering disciplines, prototyping, display technology, 3D computer graphics and programming.

Experience

ENGINEERING MANAGER - AR/VR COMPUTATIONAL DISPLAY TEAM, APPLE INC, PANEL PROCESS AND OPTICS GROUP – 2020-PRESENT

Leading a team responsible for R&D into computational display algorithms for improving user perception, quality and immersion of AR/VR technology. Day-to-day duties include iterative development of algorithms for improving production processes and run-time features, as well as user experience demonstrations of AR/VR experiences.

DISPLAY EXPLORATION ENGINEER, APPLE INC, PANEL PROCESS AND OPTICS GROUP – 2015-2020

Technical lead in a team responsible for prototyping and characterization of advanced display technologies (as part of a larger incubation initiative at Apple). Day-to-day responsibilities included incubation of concept-to-prototype demonstrations of various hardware, software and complex systems for the purpose of investigating novel user experiences related to display technology.

RESEARCH ASSISTANT, MIT MEDIA LAB, OBJECT-BASED MEDIA GROUP – 2013-2015

Performed graduate school research into the applications of digital holographic video displays. My thesis work involved hologram fringe pattern computation from real-world 3D capture. This work was used for the purpose of developing 3D telepresence and interaction applications. While exploring my creativity, I studied product design, and honed my skills in ideation, CAD modeling, and using fabrication tools to form concepts into physical, usable prototypes.

SYSTEMS ENGINEER, PERCEPTUAL COMPUTING, INTEL CORPORATION – 2010 - 2013

Early contributor to Perceptual Computing Group. Helped to outline a vision for the highly influential initiative, and developed new human-computer interaction technologies. Technical lead and product manager of a mobile sensor controller project (Intel Remote Keyboard app). Prototyped work involving motion sensing, depth-sensing camera technologies, as well as computer vision algorithms and explored techniques for remote face-to-face interaction, telepresence and 3D vision.

Education

MIT, Cambridge, MA – MS Media Arts and Sciences (Media Lab), 2015
Case Western Reserve University, Cleveland, OH – BS Computer Engineering, 2009

Skills

Core Strengths

Team leadership in incubation of user experiences that require complex system development. Ideating concepts from a blank slate, forming them into usable prototypes.

C++, GPGPU, C#/.NET+WPF, driver I/O, sockets, parallelism, SSE & AVX (SIMD), object-oriented and event-driven programming.

Design and fabrication techniques (Rhino 3D and Solidworks) 3D printing and PCB milling. Prototyping with micro-controllers, Arduino, digital circuits, optics and CNC machines.

3D computer graphics, 3D capture, 3D display and motion sensors. Highly experienced in VR and AR device system architecture, rendering pipeline, and UX development.

Digital and analog holography, computer-generated holography and diffraction modeling algorithms. Experienced in LCD, LCoS, DMD, and OLED display technologies.

Tool belt – Software development: Visual Studio, Xcode, Boost, OpenGL, CUDA, OpenCL, Win32 API, Unix, Point Cloud Library, OpenCV, DirectX, Unity.

Vision technology: structured light, time-of-flight, stereo correspondence, IR imaging, RGB+D techniques, digital imaging.

Tracking systems: Lighthouse, OptiTrack and similar pose-tracking sensors and technologies.

Familiarity – Objective-C, Java, Android and iOS development.

Publications

S. Jolly, E. Dreshaj, and V. M. Bove, "Computation of Fresnel holograms and diffraction-specific coherent panoramagrams for full-color holographic displays based on anisotropic leaky-mode modulators". Proceedings of SPIE Practical Holography XXIX: Materials and Applications (2015).

E. Dreshaj, "Holosuite: An Exploration Into Interactive Holographic Telepresence". Thesis: S.M., Massachusetts Institute of Technology, School of Architecture and Planning, Program in Media Arts and Sciences, 2015.

Interests

I love cooking, running, hiking, analog holography, "Twin Peaks", "Death Stranding", rubiks cubes, independent music and films. Currently a student pilot training at Palo Alto airport, working towards earning my private pilot's license.