# David S. Dunn

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## Research Scientist

## EDUCATION

**Doctor of Philosophy - Computer Science**          University of North Carolina – Chapel Hill
Emphasis in Virtual and Augmented Reality Displays          Chapel Hill, NC, **2019**
*Dissertation*: Deformable Beamsplitters: Enhancing Perception with Wide Field of View,
Varifocal Augmented Reality Displays

**Master of Science - Computer Science**          University of North Carolina – Chapel Hill
Emphasis in Virtual and Augmented Reality Displays          Chapel Hill, NC, **2018**

**Bachelor of Fine Arts - Animation**          Brigham Young University
Emphasis in Computer Animation Character Rigging          Provo, UT, **2009**
*Student Academy Awards*:  Pajama Gladiator and Kites
*Student Emmys*: Pajama Gladiator, Kites, Lion and the Mouse, and X-ing

## RELEVANT EXPERIENCE

- ❖ Computational Displays
- ❖ Spatial Light Modulators
- ❖ Clean Room Fabrication
- ❖ Deep Learning
- ❖ Laser & LED Illumination
- ❖ Perception & User Studies
- ❖ Rapid Prototyping
- ❖ PyTorch and Docker
- ❖ Zemax Optic Studio
- ❖ Python and OpenCV
- ❖ Matlab and C
- ❖ Solidworks and Fusion360

## AWARDS AND HONORS

**2018 ISMAR Conference Best Paper Award**          IEEE Computer Society
**2018 DOID Student Optical Design Challenge First Prize**          SPIE Photonics Europe
**2017 SIGGRAPH Emerging Technologies DCEXPO Special Prize**          Digital Content Association of Japan
**2017 Timothy L. Quigg Student Inventor of the Year Award**          UNC-Chapel Hill Computer Science
**2017 IEEE-VR Conference Best Paper Award**          IEEE Computer Society
**2017 GPU Technology Conference Best Poster Finalist (Top 5)**          NVIDIA

## SELECTED PUBLICATIONS

**Wide Field of View Varifocal Near-Eye Display Using See-Through Deformable Membrane Mirrors**
D. Dunn, C. Tippets, K. Torell, P. Kellnhofer, K. Akşit, P. Didyk, K. Myszkowski, D. Luebke, and H. Fuchs.
IEEE Transactions on Visualization and Computer Graphics, IEEE Virtual Reality. Los Angeles, CA. 2017.

**Mitigating Vergence-Accommodation Conflict for Near-Eye Displays via Deformable Beamsplitters**
D. Dunn, P. Chakravarthula, Q. Dong, and H. Fuchs.
Digital Optics for Immersive Displays Conference, Photonics Europe. Strasbourg, France. 2018.

**Focus AR: Auto-Focus Augmented Reality Eyeglasses for both Real World and Virtual Imagery**
P. Chakravarthula, D. Dunn, K. Akşit, and H. Fuchs.
IEEE Transactions on Visualization and Computer Graphics, IEEE Virtual Reality. Munich, Germany. 2018.

**Low-Latency Near-Eye Gaze Estimation with an Anatomically-Informed Dataset**
J. Kim, M. Stengel, A. Majercik, S. De Mello, D. Dunn, S. Lane, M. McGuire, D. Luebke.
Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems. Glasgow, UK. 2019.

## SELECTED TALKS AND DEMONSTRATIONS

**Perceptually-based Near Eye Displays**
MPI Informatik. Saarbruken, Germany. April 2018.

**Varifocal Near-Eye Displays**
NVIDIA GPU Technology Conference, San Jose, CA. March 2018.

**Membrane AR: Varifocal, Wide Field of View AR Display from Deformable Membranes**
SIGGRAPH Emerging Technologies, Los Angeles, CA. August 2017.

## PATENTS

**US Patent 9,983,412**                                                                                 UNC-Chapel Hill
Wide field of view augmented reality see through head mountable display with distance accommodation

## PROFESSIONAL EXPERIENCE AND CONTRIBUTIONS

**Disney Research**                          Glendale, CA                          2018 – 2020
*Post-Doctoral Research Associate*
- ❖ Developed new display technology for deployment in theme parks
- ❖ Responsible for concept, design, hardware, algorithms, and software

**NVIDIA**                          Santa Clara, CA                          2015, 2016, and 2017
*Research Intern*
- ❖ Employed deep learning for better accuracy in eye-tracking for near-eye displays
- ❖ Researched new varifocal augmented reality display technology
- ❖ Explored human visual perception with respect to near-eye displays

**Shade VFX**                          Santa Monica, CA                          2013 – 2014
*Lead Character TD*
- ❖ Created a crowd generation system for live-action stadium fill
- ❖ Responsible for all character setup on HBO mini-series
- ❖ Processed LIDAR data from scans for CG stadium recreation

**Digital Domain**                          Venice, CA                          2012 – 2013
*Character TD*
- ❖ Responsible for rigging Maleficent character for Maleficent film
- ❖ Set up character rigging pipeline for three pixie characters on Maleficent

**Disney Feature Animation**                          Burbank, CA                          2011 – 2012
*Character TD*
- ❖ Simulated cloth and hair on Wreck-It Ralph
- ❖ Technical Animation on Wreck-It Ralph

**Sony Imageworks**                          Culver City, CA                          2009 – 2011
*Intermediate Character TD*
- ❖ Developed method to speed up every stand-in rig at facility by 10-15%
- ❖ Implemented system for building proprietary Sony rigs with custom in-house transform constraint nodes and spine nodes in native Maya format for export to other facilities

**Projects and website located at [Qenops.com](Qenops.com)**