Nitish Padmanaban

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Education

Stanford University

Ph.D. Electrical Engineering *Jun 2020*
M.S. Electrical Engineering *Jun 2017*

University of California, Berkeley, College of Engineering *May 2015*

Major: B.S. Electrical Engineering & Computer Sciences *GPA:* 4.00
Minor: Bioengineering *Track:* Signal processing/Medical imaging

Industry Experience

Co-founder—Zinn Labs *Feb 2020–present*

- Automatically refocusing presbyopia correction

Engineering Intern—Display Incubation, Apple *Jun 2019–Sep 2019*

Research Intern—Advanced Photonics Team, Magic Leap *Jun 2017–Sep 2017*

- Display technology

Architecture Intern—Synaptics *Jun 2015–Aug 2015*

- Developed alternative algorithms to correct for low ground mass in touch detection
- Hand optimized assembly for 20% overall reduction in processing cycles
- Created a front-end for data collection from various types of devices

Engineering Intern—Early Identification Program, General Electric *Jun 2014–Aug 2014*

- Created verification and validation code for integration process between teams
- Used C# to implement data models to integrate new data sources into System1 Fleet
- Automated some internal tracking processes using Python

Academic Experience

PhD Candidate—Stanford Computational Imaging Lab *Jan 2016–Jun 2020*

- Investigated how vision and motion perception are influenced by graphical and optical techniques, especially as it applies to virtual reality
- Developed gaze-contingent systems to restore accommodation (refocus) in both real and virtual environments

Undergraduate Researcher—Magnetic Particle Imaging, Conolly Lab, UC Berkeley *Feb 2013–May 2015*

- Rewrote scanner code in C for the MATLAB–scanner hardware output using LabWindows libraries
- Set up a real time system for backend scanner software in using C and LabWindows with a modular setup for easy addition of devices and PID feedback control

Undergraduate Researcher—Image Processing, Ward Lab, UCSD *May 2012–Aug 2012*

- Used SPSS statistics software to assess significance of obtained results from hundreds of data points
- Implemented MATLAB algorithms and functions for automating image texture quantification on a set of T2-weighted MRI images

Publications

Neural Holography with Camera-in-the-Loop Training. Peng, Y., Choi, S., Padmanaban, N., & Wetzstein, G. *SIGGRAPH Asia, 2020*.

Factored Occlusion: Single Spatial Light Modulator Occlusion-Capable Optical See-Through Augmented Reality Display. Krajancich, B.*, Padmanaban, N.*, & Wetzstein, G. *IEEE Transactions on Visualization and Computer Graphics, 2020*.

Holographic Near-Eye Displays Based on Overlap-Add Stereograms. Padmanaban, N., Peng, Y., & Wetzstein, G. *SIGGRAPH Asia, 2019*.

Autofocals: Evaluating Gaze-Contingent Eyeglasses for Presbyopes. Padmanaban, N., Konrad, R., & Wetzstein, G. *Science Advances, 2019*.

Towards a Machine-Learning Approach for Sickness Prediction in 360° Stereoscopic Videos. Padmanaban, N.*, Ruban, T.*, Sitzmann, V., Norcia, A. M., & Wetzstein, G. *IEEE Transactions on Visualization and Computer Graphics, 2018*.

Accommodation-Invariant Computational Near-Eye Displays. Konrad, R., Padmanaban, N., Molner, K., Cooper, E. A., & Wetzstein, G. *ACM SIGGRAPH (Transactions on Graphics), 2017*.

Optimizing Virtual Reality for All Users Through Gaze-Contingent and Adaptive Focus Displays. Padmanaban, N., Konrad, R., Stramer, T., Cooper, E. A., & Wetzstein, G. *Proceedings of the National Academy of Sciences, 2017*.

Abstracts

Evaluation of Accommodation Response to Monovision for Virtual Reality. Padmanaban, N., Konrad, R., & Wetzstein, G. *3D Image Acquisition and Display: Technology, Perception and Applications, OSA Imaging and Applied Optics Congress, 2017*.

Active Feedback Real Time MPI Control Software. Padmanaban, N., Orendorff, R. D., Konkle, J. J., Goodwill, P. W., & Conolly, S. M. *2015 5th International Workshop on Magnetic Particle Imaging (IWMPI)*. Mar 2015.

Talks

Autofocals: Evaluating Gaze-Contingent Eyeglasses for Presbyopes. Padmanaban, N., Konrad, R., & Wetzstein, G. *ACM SIGGRAPH 2019 Talks*. August 2019.

Optimizing VR for All Users Through Adaptive Focus Displays. Padmanaban, N., Konrad, R., Cooper, E. A., & Wetzstein, G. *ACM SIGGRAPH 2017 Talks*. July 2017.

Computational Focus Tunable Near-Eye Displays. *NVIDIA GPU Technology Conference*. May 2017.

Invited Talks

Automatically Refocusing Reading Glasses. *TEDx Beacon Street*. Nov 2019.

Autofocals: Evaluating Gaze-Contingent Eyeglasses for Presbyopes. *MIT Research Laboratory of Electronics*. Nov 2019.

Autofocal Correction for Presbyopes and Its Application to AR/VR. *Samsung Forum*. June 2019.

Autofocal Correction for Presbyopes and Its Application to VR and AR. *Silicon Valley ACM SIGGRAPH Local Chapter*. Feb 2019.

Varifocal Lenses for Focus-Supporting Near-Eye Displays. *Max Planck Institute for Informatics; University of Tübingen*. Mar 2018.

Gaze-Contingent Adaptive Focus Near-Eye Displays. Padmanaban, N., Konrad, R., Cooper, E. A., & Wetzstein, G. *SID Symposium Digest of Technical Papers*. May 2017.

Panel: Frontiers in Technology. *Sensing and Tracking for 3D Narratives, Stanford mediaX*. October 2016.

Teaching Experience

Virtual Reality. Teaching Assistant. *EE 267, Stanford*. Spring 2019; Spring 2020.

Fundamentals of Virtual- and Augmented-Reality Technologies. Wetzstein, G., Konrad, R., & Padmanaban, N. *SID Display Week 2019 Short Courses*. May 2019.

Build Your Own VR Display: An Introduction to VR Display Systems for Hobbyists and Educators. Konrad, R., Padmanaban, N., & Ikoma, H. *Electronic Imaging 2018 Short Courses; Electronic Imaging 2019 Short Courses*. Jan 2018; Jan 2019.

Build Your Own VR System: An Introduction to VR Displays and Cameras for Hobbyists and Educators. Wetzstein, G., Konrad, R., Padmanaban, N., & Ikoma, H. *ACM SIGGRAPH 2017 Courses*. July 2017.

Public Demonstrations

Neural Holography. Peng, Y., Choi, S., Padmanaban, N., Kim, J., & Wetzstein, G. *ACM SIGGRAPH 2020 Emerging Technologies*. Aug 2020.

Autofocals: Gaze-Contingent Eyeglasses for Presbyopes. Padmanaban, N., Konrad, R., & Wetzstein, G. *ACM SIGGRAPH 2018 Emerging Technologies*. Aug 2018.

Computational Focus-Tunable Near-Eye Displays. Konrad, R., Padmanaban, N., Cooper, E., & Wetzstein, G. *ACM SIGGRAPH 2016 Emerging Technologies*. July 2016.

Scholarships and Fellowships

National Science Foundation Graduate Research Fellowship	*Apr 2015*
James H. Eaton Memorial Scholarship	*Apr 2015*
Arthur M. Hopkin Award	*Apr 2015*
Intuit Scholarship	*Mar 2014*
George A. Hansen Scholarship	*Mar 2014*
Berkeley Stem Cell Center Summer Fellowship	*Jun 2013*
Edward Frank Kraft Award	*Feb 2012*
CoreLogic Family Scholarship	*Aug 2011*
National Merit Scholarship	*Mar 2011*

Awards

SIGGRAPH 2018 Emerging Technologies DC EXPO Special Prize: *Nov 2018*
Autofocals: Gaze-Contingent Eyeglasses for Presbyopes