

# Nitish Padmanaban

nit@stanford.edu • <https://nitish.me/>

## EDUCATION

---

### Stanford University

Ph.D. Electrical Engineering

June 2020

M.S. Electrical Engineering

June 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

## ACADEMIC EXPERIENCE

---

### PhD Candidate—Stanford Computational Imaging Lab

Jan 2016–present

- Investigating how vision and motion perception are influenced by graphical and optical techniques, especially as it applies to virtual reality
- Developing 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

## INDUSTRY EXPERIENCE

---

### Engineering Intern—Display Incubation, Apple

June 2019–Sept 2019

### Research Intern—Advanced Photonics Team, Magic Leap

June 2017–Sept 2017

- Display technology

### Architecture Intern—Synaptics

June 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

June 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

## PUBLICATIONS

---

### 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.

**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 2019 Short Courses*. Jan 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*. Jan 2018.

**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

---

**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	<i>Apr 2015</i>
James H. Eaton Memorial Scholarship	<i>Apr 2015</i>
Arthur M. Hopkin Award	<i>Apr 2015</i>
Intuit Scholarship	<i>Mar 2014</i>
George A. Hansen Scholarship	<i>Mar 2014</i>
Berkeley Stem Cell Center Summer Fellowship	<i>June 2013</i>
Edward Frank Kraft Award	<i>Feb 2012</i>
CoreLogic Family Scholarship	<i>Aug 2011</i>
National Merit Scholarship	<i>Mar 2011</i>

## AWARDS

---

SIGGRAPH 2018 Emerging Technologies DC EXPO Special Prize: <i>Autofocals: Gaze-Contingent Eyeglasses for Presbyopes</i>	<i>Nov 2018</i>
--	-----------------