

# Yicheng Wu

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CONTACT INFORMATION	Ph.D. student, ECE Department Rice University Houston, TX 77005	Phone: 832-488-0946 Email: <a href="mailto:yicheng.wu@rice.edu">yicheng.wu@rice.edu</a> Website: <a href="http://yicheng.rice.edu">yicheng.rice.edu</a>
RESEARCH INTERESTS	Computational Imaging, Computational Photography and Computer Vision	
EDUCATION	<b>Rice University</b> , Houston, TX, USA Ph.D., ECE / Applied Physics Aug 2015 to present <ul style="list-style-type: none"><li>• Advisor: Ashok Veeraraghavan, Ph.D.</li><li>• GPA: 4.02/4.00</li></ul> <b>Beijing Normal University</b> , Beijing, China B.S., Physics Sept 2011 to June 2015 <ul style="list-style-type: none"><li>• Top 10 Students at BNU (top 0.5%), National Fellowship</li><li>• GPA: 92.1/100</li></ul>	
RESEARCH EXPERIENCE	<b>Long-range, Sub-diffraction Visible Imaging</b> May 2016 to present <ul style="list-style-type: none"><li>• Demonstrated the first working prototype for macroscopic Fourier Ptychography in a reflection imaging geometry that is able to image optically rough objects.</li><li>• Designed the phase retrieval algorithm with a novel image space denoising regularization to optimized image quality.</li><li>• Reconstructed various diffuse objects with sixfold improvement of spacial resolution by creating a synthetic aperture.</li></ul> <b>Portable Retinal Imager</b> November 2015 to May 2016 <ul style="list-style-type: none"><li>• Built two types of handheld, 3D-printed retinal imaging devices using smartphone camera with modulated LED light source to diagnose eye diseases at early stage.</li><li>• One is designed to work on the non-dilated pupil, which is aimed to be introduced in Indian rural areas. The other is for pediatric ophthalmology, currently tested in Texas Children's Hospital.</li></ul>	
PUBLICATIONS	<ol style="list-style-type: none"><li>1. Holloway, J., <b>Wu, Y.</b>, Sharma, M.K., Cossairt, O., Veeraraghavan, A. "SAVI: Synthetic Apertures for long-range, sub-diffraction Visible Imaging Using Fourier Ptychography." <i>Science Advances</i>, accepted.</li><li>2. <b>Wu, Y.</b>, Ma, J., Yang, Y., Sun, P. "Improvements of measuring the width of Fraunhofer diffraction fringes using Fourier transform." <i>Optik-International Journal for Light and Electron Optics</i>, 126(23):4142-4145, 2015.</li><li>3. <b>Wu, Y.</b>, He, C., Wang, Y., Liu, X., Zhou, J. "Controlling the wave propagation through the medium designed by linear coordinate transformation." <i>European Journal of Physics</i>, 36(1):015006, 2014.</li></ol>	
POSTER PRESENTATION	<ol style="list-style-type: none"><li>1. "A portable, low-cost, non-mydratic device for retinal imaging", <i>ECE Corporate Affiliates Day</i>, 2016</li></ol>	

COURSEWORK  
PROJECTS

**Augmented Reality Video**

- Created an immersive 3-D video with interaction between real scene and virtual objects from scratch, in which virtual objects are translated, rotated and scaled by hand gestures using feature detection and depth estimation.

**Object Recognition from CIFAR-10**

- Built GPU-accelerated Convolutional Neural Networks (CNNs) to classify 60,000 images from the CIFAR-10 dataset using MatConvNet and Torch.
- Achieved object recognition accuracy of 0.89 and ranked top 5 in class.

**Predicting Parkinson's Disease Progression with Smartphone Data**

- Analyzed data from smartphones of 16 participants to quantify Parkinson's Disease symptoms.
- Built a Support Vector Machine classifier with selected features and achieved 0.9 detection rate.

**Monte-Carlo Simulation of Photon Transport in a Scattering Medium**

- Designed a statistical scattering model to simulate the behavior of photons penetrating into a scattering medium.
- Calculated quantitatively the probability that photons are absorbed by medium or pass through the boundary with different parameters such as refraction index and anisotropy of the medium.

SKILLS

MATLAB, Python, Mathematica, C, C++, Torch

LEADERSHIP

Chairman of Student Union in Physics Department

May 2013 to May 2014