

Huaijin (George) Chen

CONTACT INFORMATION Department of Electrical and Computer Engineering tel: +1 (419) 909-0509
Rice University website: <http://hgchen.com>
6100 Main MS-366, Houston TX, 77005 e-mail: huaijin.chen@rice.edu

INTERESTS Computational Photography — Computer Vision — Deep Learning

EDUCATION **Rice University**, Houston, TX, USA
• **Ph.D., Electrical and Computer Engineering (ECE)** Oct 2018 (Expected)
• **M.S., Electrical and Computer Engineering (ECE)** May 2016
Texas Instruments Distinguished Fellowship
Advisor: Prof. Ashok Veeraraghavan

Rochester Institute of Technology, Rochester, NY, USA
• **B.S., Imaging Science** (Magna Cum Laude and Honors Program) May 2013
Minor/Concentration in Music and Management Information System
Advisor: Prof. Jinwei Gu

University of Oxford, Oxford, UK
• **Visiting Student**, St. Catherine's College Fall 2012
Courses in Computer Graphics and Music Analysis

PUBLICATIONS Wang, Zihao, Leonidas Spinoulas, Kuan He, Lei Tian, Oliver Cossairt, Aggelos K. Katsaggelos, and **Huaijin G Chen**. "Compressive Holographic Video." *Optics Express* 25, no. 1 (2017): 250-262. [\[PDF\]](#)

Chen, Huaijin G., "Efficient Machine Vision Using Computational Cameras", *M.S. Dissertation, Rice University, 2016*.

Chen, Huaijin G.*, Suren Jayasuriya*, Jiyue Yang, Judy Stephen, Sriram Sivaramakrishnan, Ashok Veeraraghavan and Alyosha Molnar, "ASP Vision: Optically Computing the First Layer of Convolutional Neural Networks using Angle Sensitive Pixels", *The IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2016, Oral, 3% acceptance rate* (*Joint first authors) [\[PDF\]](#) [\[Website\]](#)

Chen, Huaijin G., M. Salman Asif, Aswin C. Sankaranarayanan and Ashok Veeraraghavan, "FPA-CS: Focal Plane Array-based Compressive Imaging in Short-wave Infrared", *The IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2015, pp. 2358-2366* [\[PDF\]](#) [\[Website\]](#)

Chen, Huaijin G.*, Fengqiang Li*, Adithya Pediredla, Ashok Veeraraghavan, Oliver Cossairt, "CS-ToF: Compressive High-resolution Time-of-flight Imaging using Phasor", *Under review*. (*Joint first authors)

Chen, Huaijin G., Yuzhong Huang, Ashok Veeraraghavan, Ankit Patel, "Learning Event-driven Representation for Video Recognition", *In Preparation*

ENTREPRENEURSHIP EXPERIENCE Co-founder, **SenseWatch** (<http://sense.watch/>) May 2015 - May 2016
• Created SenseWatch within the Rice OwlSpark Program at Texas Medical Center X (TMCx). SenseWatch is a startup focused on utilizing wearable devices for human-computer interaction via gesture recognition and vital sign interpretation.

RESEARCH EXPERIENCE **IBM**, Intern, Austin Research Lab May 2016 - Aug 2016
• **Multi-purpose Elderly Robotic Assistant (MERA)**
– Manager: Christopher Durham
– Collaborators: Jinho Lee, Maynk Kumar and Susann Keohane
– Press Coverage: [\[Austin American-Statesman\]](#) [\[PR News Wire\]](#) [\[IEEE GlobalSpec\]](#) [\[KUOW Seattle Public Radio\]](#) [\[McKnight's Senior Living\]](#) [\[Health Management Technology\]](#) [\[Rice University News\]](#) [\[IBM Newsroom\]](#)

- **Deep Learning-based Robotic Visual Exploration**
 - Manager: Christopher Durham
 - Collaborators: Inseok Hwang, Jinho Lee and Bumssoo Kang

Northwestern University, EECS Department, Cossairt Lab Mar 2016 - May 2016

- **Compressive Video Holography, and High-resolution ToF Imaging**
 - Collaborators: Fengqiang Li, Zihao Wang, Leonidas Spinoulas, and Prof. Oliver Cossairt
 - Setup two DMD-based spatial-temporal multiplexing imaging systems for high-resolution ToF imaging and compressive video holography.
 - Designed a hyperspectral imaging system for cultural heritage imaging.
 - Coordinated the IEEE ICCP 2016.

Cornell University, ECE Department, Molnar Lab Sep 2015 - Nov 2015

- **A Biologically-inspired Imaging Systems for Energy-efficient Deep Learning**
 - Collaborators: Suren Jayasuriya and Prof. Alyosha Molnar,
 - Developed an energy-efficient computer vision system that includes a computational camera front-end that generates responses similar to the V1 layer of the human visual cortex, and a reduced convolutional neural network (CNN) back-end.
 - System achieves equivalent performance on visual recognition tasks while saving 97.5% and 4-7% energy in sensing and recognition stage, respectively.

Rice University, ECE Department, Ashok Lab Feb 2014 - Present

- **Focal Plane Array Compressive Sensing**
 - Project Committee: Profs. Ashok Veeraraghavan, Kevin Kelly and Richard Baranuick
 - Prototyped the camera system, including the optical design and assembly
 - Implemented the compressive sensing and reconstruction framework
 - Tested and evaluated the system, and published results at CVPR 2015

Brown University, Department of Computer Science June 2012 - Aug 2012

- **Scene Understanding and Geo-localization of Large-scale Datasets**
 - Advisor: Prof. James Hays
 - Developed a pipeline that uses multiple land cover databases to map the land cover attributes and label geo-tagged public-domain images harvested from Flickr
 - Automated the labeling of the potential land cover attributes in each image and trained SVM classifiers to perform land cover recognition on those images and evaluated the result

RIT, Department of Computer Science / Center for Imaging Science Apr 2011 - May 2013

- **Text Detection and Inpainting in Video CAPTCHA**
 - Senior Thesis, Committee: Prof. Richard Zanibbi (Chair), Jeff Pelz, and Carl Salvaggio
 - Improved the conventional video CAPTCHA algorithm by detecting and removing the text within the frames, and evaluating the performance of the developed system
- **Programmable, Adaptive Aperture Imaging with a LCD Modulator**
 - Advisor: Prof. Jinwei Gu
 - Implemented a low-cost version of Columbia University's Adaptive Dynamic Range camera by using consumer-level LCD as the pixel-level controllable light attenuator
- **A Dual-side Viewable LCD System for Portable Devices,**
 - Advisor: Prof. Carl Salvaggio
 - Proposed and implemented a novel display design that utilizes both sides of a conventional LCD panel
 - Project funded by Kodak-RIT CIS Innovative Micro-grant

INVITED TALKS/
PRESENTATIONS

“*Computational Photography: Overview and Recent Progress*”, Research Lab, Sunny Optical Technology (Group) Co., Ltd., Zhejiang, China, Oct 2016

“*Efficient Machine Vision using Computational Cameras*”, College of Computer Science and Software Engineering, Shenzhen University, China, Oct 2016 [\[Link\]](#)

“*Efficient Machine Vision using Computational Cameras*”, Computational Photography Lab, Northwestern University, Mar 2016

“FPA-CS:Focal Plane Array-based Compressive Imaging in Short-wave Infrared”, Mixed Signal Integrated Circuit Lab, Cornell University, Oct 2015

“Focal Plane Array Compressive Sensing Camera”, Visual Computing Research Center, Chinese Academy of Science - Shenzhen Advanced Institute of Technology, June 2014

“Programmable, Adaptive Aperture Imaging with a LCD Modulator”, Undergraduate Research Symposium, Rochester Institute of Technology, NY, August 2011

LIVE PERFORMANCE Chen, Huaijin*, Hope Cowan* and Emma Wine*, ”Colorspace”, Live harp and computer music performance, *15th LaTex Electronic Music Festival*, Houston, TX, Nov 20-21, 2015

POSTER PRESENTATION “ASP Vision: Optically Computing the First Layer of Convolutional Neural Networks using Angle Sensitive Pixels”, *IEEE International Conference on Computation Photography (ICCP)*, 2016

“FPA-CS: Focal Plane Array-based Compressive Imaging in Short-wave Infrared”, *IEEE International Conference on Computation Photography (ICCP)*, 2015, **Best Poster: Runner-up**

RESEARCH FUNDING **Principle Investigator**, Kodak-RIT CIS Innovative Micro-grant, *A Dual-side Viewable LCD System for Portable Devices* \$ 1,791, Mar 2011

STUDENT MENTORING Napas Udomsak, B.S. ECE, Rice University 19’, Century Scholar
Yuzhong Huang, B.S. ECE, Franklin W. Olin College of Engineering 18’
Jiyue Yang, B.S. ECE, Cornell University 16’, now at UCLA ECE
Judy Stephen, B.S. ECE, Cornell University 16’

PROFESSIONAL SERVICE Reviewer, OSA Applied Optics
Volunteer Chair, IEEE International Conference on Computational Photography (ICCP) 2016
Student Volunteer, IEEE ICCP 2013 and 2015
IS&T, SPIE Student Chapter at RIT
Student Member, AAAS, IEEE

TEACHING TA, ELEC 345/546 Introduction to Computer Vision, Rice University, Spring 2017
Invited Instructor, ELEC 681 Fundamentals of Machine Learning, Rice University, Spring 2016
TA, BIOE 451/452, ELEC 494 Senior Design, Rice University, Fall 2015 - Spring 2016
TA, ELEC 241 Fundamentals of Electrical Engineering I, Rice University, Spring 2014

LEADERSHIP ACTIVITIES **Co-founder**, Society of Asian Scientists and Engineers, Rice Chapter Nov 2014 - Apr 2015
ECE Representative, Rice Graduate Student Association Apr 2014 - Mar 2016
VP, RIT Chinese Culture Club Dec 2010 - May 2012
Treasurer, Management Information System Team, RIT Dec 2010 - Sep 2011
Peer Advisor Leader, RIT New Student Orientation Aug 2010 - Sep 2010

HONORS AND SCHOLARSHIPS **Texas Instruments (TI) Distinguish Fellowship** (2013 - 2018): Fellowship covering partial tuition provided to selected graduate students at Rice ECE department

Rice ECE Department Fellowship (2013 - 2019): Fellowship provided to Ph.D students at ECE Department of Rice University

RIT Honors Scholarship (2011 - 2013): Tuition scholarship given to the top 1% of RIT students who are accepted to the Honors Program for the excellence in academic performance, community service and leadership

Beta Gamma Sigma: National honors society for business students (I entered college as business major - Management Information System)

RIT Honors Summer Research Award (2011): Grant and stipend for conducting research with a faculty member at RIT during the summer quarter

RIT Nathaniel Rochester Scholarship (2011- 2013): Tuition scholarship for undergraduate studies based on academic merit and leadership

Other merit-based scholarship and awards: RIT International Student Scholarship (2009 - 2013), Dean's List (2009 - 2013), Isaac Gordon Scholarship (2011), John Whitman II Memorial Scholarship (2010)

EXTRA-
CURRICULAR
ACTIVITIES

Tenor at RIT Singers

Post-production Technician at RIT 89.7 WITR Radio Station

Volunteer at Foodlink Rochester

Volunteer at Elderly Unity Cottage Rochester