

## CURRICULUM VITAE OF PROF. CHEN SHOUSHUN (COLLABORATOR)

**NAME:** Shoushun Chen

**TITLE:** Assistant Professor

**OFFICE MAILING ADDRESS:** School of Electrical and Electronic Engineering, Nanyang Technological University, BLK S1-B1A-08, 50 Nanyang Ave

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**CURRENT POSITION:** Assistant Professor at School of EEE, Nanyang Technological University (July 2009 – present)

### **EMPLOYMENT HISTORY**

- Program Director (Smart Sensors), VIRTUS, IC Design Centre of Excellence, School of EEE, NTU, Aug. 2010 – present
- Assistant Professor, School of EEE, Nanyang Technological University (NTU), Jul. 2009 – present
- Postdoctoral Research Associate, Electrical Engineering Department, Yale University, Feb. 2008 - May 2009
- Postdoctoral Research Fellow, Wireless IC System Design Centre (WISE), Hong Kong University of Science and Technology (HKUST), Jul. 2007 - Jan. 2008
- Postdoctoral Research Associate, Electronic and Computer Engineering Department, HKUST, Jan. 2007 - Jun. 2007
- Research Assistant /Teaching Assistant, Electronic and Computer Engineering Department, HKUST, Sep. 2003 - Jan. 2007
- Research Assistant, Inst. of Computing Technology & Inst. of Microelectronics, Chinese Academy of Sciences, Sep. 2000 - Jul. 2003

### **ACADEMIC QUALIFICATIONS**

- Ph.D, Hong Kong University of Science and Technology, Hong Kong SAR, 2007
- Master of Engineering, Institute of Microelectronics, Chinese Academy of Sciences, China, 2003
- Bachelor of Science, Peking University, China, 2000
- IEEE Senior Member

### **RESEARCH INTERESTS:**

- Smart image sensor and imaging system
- remote sensing imaging system
- satellite engineering
- mixed-signal integrated circuits

### **LIST OF 5 MOST SIGNIFICANT PUBLICATIONS IN THE PAST 3 YEARS RELEVANT TO THE PROPOSAL**

1) Hang Yu, Wei Tang, Menghan Guo and Shoushun Chen, "A Two-step Prediction ADC Architecture for Integrated Low Power Image Sensors," IEEE Transactions on Circuits and Systems, part I: Regular papers (TCAS-I), Volume 64 , Issue 11 , pp. 50 - 60, 2017

- 2) Yifei Liu, Xiaoyu Yu, Shoushun Chen and Wei Tang, "Object Localization and Size Measurement Using Networked Address Event Representation Imagers," IEEE Sensors Journal, Volume 16 , Issue 9 , pp. 2894 - 2895, 2016
- 3) Vigil Varghese and Shoushun Chen, "Polarization Based Angle Sensitive Pixels for Light Field Image Sensors with High Spatio-Angular Resolution," IEEE Sensors Journal, Volume 16 , Issue 13 , pp. 5183 - 5194, 2016
- 4) Xinyuan Qian, Hang Yu and Shoushun Chen, "A Global-Shutter Centroiding Measurement CMOS Image Sensor with Star Region SNR Improvement for Star Trackers," IEEE Transactions on Circuits and Systems for Video Technology (TCSVT), Volume PP , Issue 99 , pp. 1 - 10, 2015.
- 5) Xinyuan Qian, Hang Yu, Shoushun Chen and Kay Soon Low, "A High Dynamic Range CMOS Image Sensor with Dual-Exposure Charge Subtraction Scheme," IEEE Sensors Journal, Volume 15, Issue 2, pp. 661 - 662, 2015.

## **PATENTS**

- Mehta Deval Samirbhai, Shoushun Chen and Kay Soon Low, "A High Accuracy Star Tracker Using Running Sequential Angular Match Technique," Singapore provisional patent application number 10201603223W, Apr 22, 2016.
- Shoushun Chen, Lier Siek, Gibran Limi Jaya, Bin Hu and Hang Yu, "Time To Reference Column Parallel Current Mode CMOS Image Sensor," US provisional patent application number: 62/072,700, 10/30/2014.
- Shoushun Chen, Kay Soon Low and Hang Yu, "A method to merge ambient light sensor into a CMOS image sensor," PCT application number: PCT/SG2014/000319, 7/3/2013.
- Shoushun Chen, Kay Soon Low and Xinyuan Qian, "A High Dynamic Range CMOS Image Sensor System with Adaptive Integration Time and Multiple Readout Channels," US Patent application number: 13/946,567, 7/19/2012.
- Shoushun Chen, "A High Speed Motion Detection Image Sensor," PCT application number: PCT/SG2014/000023, 1/31/2013

## **SCIENTIFIC AWARDS**

- Best Paper Award (Cadence Award) at the 12th International SoC Design Conference 2015, "A High-Resolution On-Chip Propagation Delay Measurement Scheme"
- Best Paper Award (LG Award) at the 10th International SoC Design Conference 2013, "Linear Angle Sensitive Pixels for 4D Light Field Capture"
- Best Paper Award at the 5th IEEE International Workshop on System on Chip for Real-Time Systems (IWSOC), "A scalable low power imager architecture for compound-eye vision sensors".

## **SUMMARY OF MOST RELEVANT RESEARCH OUTCOMES FROM ALL PREVIOUS GRANTS**

TITLE: Towards "3D" Nanoscope with Super Spatial Resolution (funded by MOE, \$933,500). This work builds heavily on the theoretical premise laid down by the earlier work on multi-aperture imaging. We explore other alternative solutions such as differential quadrature pixels, polarization pixels, multi-finger pixels and combinations of these to effectively capture the angular information of light by consuming only a very small imager area. We demonstrate a new digital refocusing technique using the developed sensor, thus providing an end-to-end solution for solving the defocus problem in photography. We also made significant progress in the aspect of nanoparticles and nanostructures study, especially the far-field sub-diffraction-limit super-oscillatory focusing. It offers competitive advantage over the near-field technique with the immediate proximity of object.