

# Bihan Wen

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CONTACT INFORMATION	Departmental of Electrical and Computer Engineering University of Illinois at Urbana-Champaign <i>Address:</i> 131 Coordinated Science Lab 1308 W. Main Street, Urbana, IL 61801, USA	<i>Mobile:</i> (217) 402-4900 <i>E-mail:</i> bwen3@illinois.edu <i>Web:</i> <a href="http://web.engr.illinois.edu/~bwen3">web.engr.illinois.edu/~bwen3</a>
RESEARCH INTERESTS	<ul style="list-style-type: none"><li>• Data Representation and Feature Learning</li><li>• Machine Learning, Optimization and Online Methods</li><li>• Image / Video Processing and Computer Vision</li><li>• Computational Imaging and Inverse Problems</li></ul>	
EDUCATION	<b>University of Illinois at Urbana-Champaign (UIUC)</b> <ul style="list-style-type: none"><li>• <b>Ph.D. Candidate</b>, Electrical and Computer Engineering, Urbana, IL, USA</li><li>• Thesis Topic: Nonlocal and Structured Sparse Signal Modeling and Applications</li><li>• Advisor: Prof. Yoram Bresler</li></ul> <b>University of Illinois at Urbana-Champaign (UIUC)</b> <ul style="list-style-type: none"><li>• <b>Master of Science</b>, Electrical and Computer Engineering, Urbana, IL, USA</li><li>• Thesis Topic: Transform Learning Based Image and Video Processing</li><li>• Advisor: Prof. Yoram Bresler</li></ul> <b>Nanyang Technological University (NTU)</b> <ul style="list-style-type: none"><li>• <b>Bachelor of Engineering</b>, Electrical and Electronic Engineering, Singapore</li><li>• Graduation with the highest honor, Dean's List 2008-2012.</li><li>• GPA: <b>4.94/5.00</b>, Department Rank <b>top 1%</b>.</li></ul>	Expected: April, 2018 Aug, 2012 - Dec, 2015 August, 2008 - May, 2012
HONORS AND AWARDS	<ul style="list-style-type: none"><li>• Warren W. Yee Memorial Fellowship</li><li>• UIUC Conference Travel Award</li><li>• Top 10% Paper Award, IEEE International Conference on Image Processing</li><li>• Carl Storm Fellowship</li><li>• Harold L. Olesen Award Nomination for Teaching</li><li>• Teachers Ranked As Excellent</li><li>• Professional Engineers Board (PEB) Gold Medal</li><li>• EEE Department Excellence Award</li><li>• Motorola Book Prize</li><li>• Best Undergraduate Peer Tutor Award</li><li>• Titanium Award, URECA research competition</li><li>• SM2 Undergraduate Scholarship</li></ul>	Sep, 2016 Aug, 2016 Oct, 2014 July, 2014 Dec, 2013 Aug, 2013 May, 2012 May, 2012 Apr, 2012 Dec, 2011 Mar, 2010 Aug, 2008
RESEARCH EXPERIENCE	<b>University of Illinois at UrbanaChampaign, Urbana, IL, USA</b> <i>Research Assistant</i> , Advisor: Prof. Yoram Bresler <ul style="list-style-type: none"><li>• Transform learning for data feature representation and sparse modeling.</li><li>• Streaming data representation learning and online reconstruction.</li><li>• Data-driven methods for computer vision, image and video processing.</li><li>• Hybrid vision applications with compressed sensing.</li><li>• Computational imaging, Compressed sensing, and Inverse problems.</li></ul> <b>Mitsubishi Electric Research Laboratories, MA, USA</b> <i>Research Intern</i> , Mentors: Dr. Dehong Liu and Prof. Ulugbek Kamilov	August, 2012 - present May, 2017 - August, 2017

**Dolby Laboratories, CA, USA** May, 2016 - August, 2016  
*Research Intern*, Mentor: Dr. Guan-Ming Su

**Advanced Digital Science Center, Singapore** May, 2015 - August, 2015  
*Research Intern*, Mentors: Dr. Stefan Winkler and Dr. Rama Ratnam

**Plunify, Singapore** May, 2011 - August, 2011  
*Software Engineer Intern*, Mentor: Harn-Hua Ng (CEO)

SELECTED  
JOURNAL PAPERS

**Bihan Wen**, Saiprasad Ravishankar and Yoram Bresler. “VIDOSAT - High-dimensional Sparsifying Transform Learning for Online Video Restoration”, *IEEE Transactions on Image Processing (TIP)*, 2017 (under review, *arXiv:1710.00947*).

**Bihan Wen**, Saiprasad Ravishankar and Yoram Bresler. “FRIST Flipping and Rotational Invariant Sparsifying Transform Learning and Applications”, *Inverse Problems (IVP)*, 2017.

**Bihan Wen**, Saiprasad Ravishankar and Yoram Bresler. “Structured Overcomplete Sparsifying Transform Learning with Convergence Guarantees and Applications”, *International Journal of Computer Vision (IJCV)*, 2016.

Ding Liu, Zhaowen Wang, **Bihan Wen**, Jianchao Yang, Wei Han and Thomas S. Huang. “Robust Image Super-Resolution via Deep Networks with Sparse Prior”, *IEEE Transactions on Image Processing (TIP)*, 2016.

Soumyabrata Dev, **Bihan Wen**, Yee-Hui Lee and Stefan Winkler. “Ground-based Image Analysis: A Tutorial on Machine-Learning Techniques and Applications”, *IEEE Geoscience and Remote Sensing Magazine (GRSM)*, 2016.

Saiprasad Ravishankar, **Bihan Wen** and Yoram Bresler. “Online Sparsifying Transform Learning Part I: Algorithms”, *IEEE Journal of Selected Topics in Signal Processing (JSTSP)*, 2015.

SELECTED  
CONFERENCE  
PAPERS

Ding Liu, **Bihan**, Xianming Liu, and Thomas S Huang. “When Image Denoising Meets High-Level Vision Tasks: A Deep Learning Approach”. *Conference on Computer Vision and Pattern Recognition (CVPR)*, 2018 (submitted, *arXiv:1706.04284*).

**Bihan Wen**, Ulugbek Kamilov, Dehong Liu, Hassan Mansour, and Petros Boufounos. “Deep-CASD: An End-to-End Approach for Multispectral Image Super-Resolution”. *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, 2018 (submitted).

**Bihan Wen**, and Guan-Ming Su. “TransIm - Transfer Image Local Statistics Across EOTFs for HDR Image Applications”. *IEEE International Conference on Multimedia and Expo (ICME)*, 2018 (submitted).

**Bihan Wen**, Yanjun Li, Luke Pfister and Yoram Bresler. “Joint Adaptive Sparsity and Low-rankness on the Fly: An Online Tensor Reconstruction Method for Video Denoising”, *International Conference on Computer Vision (ICCV)*, 2017.

**Bihan Wen**, Yanjun Li and Yoram Bresler. “When Sparsity meets Low-Rankness: Transform Learning with Non-local Low-rank Constraint for Image Restoration”. *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, 2017.

**Bihan Wen**, Saiprasad Ravishankar and Yoram Bresler. “Learning Flipping and Rotational Invariant Sparsifying Transform”. *IEEE International Conference on Image Processing (ICIP)*, 2016.

**Bihan Wen**, Ye Zhu, Ramanathan Subramanian, Tian-Tsong Ng, Xuanjing Shen and Stefan Winkler. “COVERAGE A Novel Database for Copy-Move Forgery Detection”. *IEEE International Conference on Image Processing (ICIP)*, 2016.

**Bihan Wen**, Saiprasad Ravishankar and Yoram Bresler. “Video Denoising Using Online 3D Sparsifying Transform Learning”. *IEEE International Conference on Image Processing (ICIP)*, 2015.

**Bihan Wen**, Saiprasad Ravishankar and Yoram Bresler. “Learning Overcomplete Sparsifying Transforms with Block Cosparsity”. *IEEE International Conference on Image Processing (ICIP)*, 2014. (**The 10% best paper award**).

Saiprasad Ravishankar, **Bihan Wen** and Yoram Bresler. “Online Sparsifying Transform Learning for Signal Processing”. *IEEE Global Conference on Signal and Information Processing (GlobalSIP)*, 2014.

**Bihan Wen** and Yilong Lu. “A study of synthetic aperture radar imaging with compressed sensing”. *IEEE Asia-Pacific Conference on Antennas and Propagation (APCAP)*, 2012.

**Bihan Wen** and Yilong Lu. “MATLAB tools for EnvisAT ASAR data visualization and image enhancement”. *SPIE International Symposium Lidar and Radar Mapping Tech*, 2011.

PATENTS

“Multispectral Image Fusion Technique via Deep Learning Approach,” with Ulugbek Kamilov, Dehong Liu, Hassan Mansour, and Petros Boufounos. Mitsubishi Electric Research Laboratories. US pattern pending.

“Inverse Luma/Chroma Mappings With Histogram Transfer And Approximation, ” with Harshad Kadu and Guan-Ming Su. Dolby Laboratories. US pattern pending.

TEACHING  
EXPERIENCE

**ECE 513: Vector Space Signal Processing** Spring 2017  
*Guest Lecturer*, Instructor: Prof. Yoram Bresler

**ECE 513: Vector Space Signal Processing** Spring 2016  
*Teaching Assistant*, Instructor: Prof. Yoram Bresler

**ECE 210: Analog Signal Processing** Spring and Fall 2014  
*Lead Teaching Assistant*, Instructor: Prof. Farzad Kamalabadi

**ECE 210: Analog Signal Processing** Spring and Fall 2013  
*Teaching Assistant*, Instructor: Prof. Erhan Kudeki

**EE 2008: Engineering Mathematics, EE 2010: Signal and System** Fall 2011  
*Undergraduate Peer Tutor*

PROPOSAL  
WRITING  
EXPERIENCE

**Contributed to NSF Granted Project:**

- Theory and Algorithms for Learning Sparse Representations for Large-Scale Problems September, 2013 - August, 2017  
Awarded Amount: **\$495,000**

**Other Awarded Proposal Writing Experiences:**

- Warren W. Yee Memorial Fellowship (2016).
- UIUC Conference Travel Award (2016).
- Carl Storm Fellowship (2014).

ACADEMIC  
SERVICES

- Conference Program Committee (PC) Member and Reviewer:
  - *Conference on Computer Vision and Pattern Recognition (CVPR)*, 2018.
  - *IEEE International Conference on Image Processing (ICIP)*, 2017.
- Journal Reviewer:
  - IEEE Transactions on Image Processing (TIP).
  - IEEE Transactions on Signal Processing (TSP).
  - IEEE Transactions on Circuits and Systems for Video Technology (TCSVT).
  - IEEE Transactions on Information Forensics and Security (TIFS).
  - IEEE Transactions on Computational Imaging (TCI).
  - Neurocomputing
  - Electronics Letters
  - IET Radar, Sonar and Navigation
  - Journal of Electronic Imaging (JEI)
  - Complexity
- Conference Organizer:
  - Coordinated Science Laboratory Student Conference (CSLSC), 2017  
Machine Learning and Signal Processing, Area Chair.
  - Allerton Conference on Communication, Control, and Computing, 2017  
Learning and Optimization, Session Assistant.

INVITED TALKS AND  
LECTURES

- “Sparsifying Transform Learning for Image and Video Applications”. Invited Talk, Mitsubishi Electric Research Laboratories. July, 2017.
- “Introduction to Compressed Sensing and Sparse Coding”. Guest Lecture, University of Illinois at Urbana-Champaign. March, 2017.
- “Data-driven Image and Video Modeling and Applications”. Invited Talk, Qualcomm. November, 2016.
- “Sparsifying Transform Learning and Applications”. Invited Talk, Social Hour Seminar at Coordinated Science Laboratory. September, 2016.
- “Transform Learning for Big Data Applications”. Invited Talk, Advanced Digital Science Center. August, 2015.
- “Online Sparsifying Transform Learning and Big Data Applications”. Invited Talk, Coordinated Science Laboratory Student Conference. February, 2015.

PROFESSIONAL  
SOCIETY  
MEMBERSHIPS

- IEEE, Student Member
- IEEE, Signal Processing Society Member
- IEEE, Computational Imaging Special Interest Group Affiliate Member

HOME PAGE AND  
LINKS

- Homepage: <http://web.engr.illinois.edu/~bwen3/>.
- Transform Learning Project Homepage: <http://transformlearning.csl.illinois.edu/>.
- Codes and Database on Github: <https://github.com/wenbihan>.
- Google Scholar: [scholar.google.com/citations?user=yPkClpwAAAAJ](https://scholar.google.com/citations?user=yPkClpwAAAAJ).