

## Curriculum Vitae – Bin Liu, Ph.D.

---

CONTACT INFORMATION	School of Marine Sciences, Shanghai Ocean Univ 904 Library & Info Bldg 999 Huchenghuan Rd, Pudong Shanghai 201306, China	<i>Mobile:</i> (+86)186-0178-9768 <i>EM:</i> BLiu.sjtu@gmail.com <i>Wechat:</i> ibenfox <i>WWW:</i> My Page
RESEARCH INTERESTS	<b>Remote sensing data analysis and image understanding with statistical modeling, data mining, and machine learning / deep learning (from September 2007 to Present).</b> <b>Remote sensing for oceanography (from June 2018 to Present).</b>	
EDUCATION	<b>Shanghai Jiao Tong University</b> , Shanghai, China  Ph.D., Electronic Engineering, September 2009 – June 2015 <ul style="list-style-type: none"><li>• Advisers: Professors Xingzhao Liu and Wenxian Yu</li><li>• Thesis Title: Research on Edge and Region Information Extraction for Polarimetric SAR Images</li><li>• Defense committee: Pr. Jie Shan (Chair, Purdue University, USA), Pr. Jiajun Lin (East China University of Science and Technology, China), Pr. Wenxian Yu (Shanghai Jiao Tong University, China), Pr. Xiaohua Tong (Tongji University, China), and Pr. Junfeng Wang (Shanghai Jiao Tong University, China)</li></ul> <b>TELECOM ParisTech</b> , Paris, France  Visiting Ph.D. Student, Image, Data, Signal department, October 2012 – April 2013 <ul style="list-style-type: none"><li>• Supervisor: Professor Florence Tupin</li><li>• Topic: Detection and characterization of built-up regions for high resolution SAR images in urban areas</li></ul> <b>Technical University Munich</b> , Munich, Germany  Summer School Student, July 2012 <ul style="list-style-type: none"><li>• Organizer: IEEE Geoscience and Remote Sensing Society and Department of Photogrammetry and Remote Sensing of Technical University Munich</li><li>• Topics: The state-of-the-art knowledge of remote sensing given by world-renowned experts</li></ul> <b>The University of Hong Kong</b> , Hong Kong, China  Summer School Student, July 2010 <ul style="list-style-type: none"><li>• Organizer: Imperial College London, the University of Hong Kong, and Shanghai Jiao Tong University.</li><li>• Topics: Developing transferable and research skills in an international environment</li></ul> <b>Shanghai Jiao Tong University</b> , Shanghai, China  M.S., Electronic Engineering, September 2007 – June 2009 <ul style="list-style-type: none"><li>• Adviser: Professor Xingzhao Liu</li><li>• Thesis Topic: Image Formation for Synthetic Aperture Radar Based on GPU</li></ul> B.S., Electronic Engineering, September 2003 – June 2007 <ul style="list-style-type: none"><li>• Adviser: Professor Xingzhao Liu</li><li>• Thesis Topic: Terahertz Technology and its Applications in Imaging</li><li>• Rank: 13/330 in the Department of EE, top 5%</li></ul>	

PROFESSIONAL  
EXPERIENCE

**Shanghai Ocean University**, Shanghai, China

Postdoc Research Fellow, School of Marine Sciences **June 2018 to Present**

- Remote sensing data analysis for oceanography with the use of machine learning / deep learning: coastal area land cover classification and environment monitoring, coastal area flooding detection and evaluation after hurricane / typhoon / tropical cyclone, internal wave detection, wind information retrieval from SAR images.

**Shanghai Jiao Tong University**, Shanghai, China

Research Assistant Professor, Institute for Sensing and Navigation and Co-Advisor for the Radar Imagery Group **September 2015 to May 2018**

- Methods of superpixel generation and image segmentation for SAR images, and corresponding applications, including image classification, target detection, and change detection.
- **The OpenSAR Project**: an open and large-volume dataset dedicated to Sentinel-1 image interpretation and quality assessment, including OpenSARShip (ship target), OpenSARUA (urban area), and OpenSARE+ (plus environment)
- SAR marine applications, including wind retrieval, statistical analysis, and roll analysis. This involves international collaborations with experts from NOAA, USA.

PUBLISHED BOOKS [1] W. Yu, K. Ji, and **B. Liu**. Information Processing Techniques for Maritime Targets via the Integration of Spaceborne SAR and AIS. *Science Press* (in Chinese), June 2017.

PUBLISHED BOOK CHAPTERS [2] L. Huang, B. Li, **B. Liu**, W. Guo, Z. Zhang, and W. Yu. Ship Characterization and Analyses in Sentinel-1 Imagery Based on a Large and Open Dataset. in *Advances in SAR Remote Sensing of Oceans* (Editors: X. Li, H. Guo, K.-S. Chen, and X. Yang). *CRC Press*, estimated publication date: December 2018.

SELECTED REFEREED JOURNAL PUBLICATIONS [3] H. Hu, **B. Liu**(\*<sup>1</sup>), Z. Zhang, W. Guo, and W. Yu. Superpixel generation for synthetic aperture radar imagery using edge-dominated local clustering. *Journal of Applied Remote Sensing*, 2018. 12(4), 045006 (2018). doi:10.1117/1.JRS.12.045006

[4] B. Li, **B. Liu**(\*), W. Guo, Z. Zhang, and W. Yu. Ship Size Extraction for Sentinel-1 Images Based on Dual-Polarization Fusion and Nonlinear Regression: Push Error Under One Pixel. *IEEE Transactions on Geoscience and Remote Sensing*, 2018. 56(8):4887–4905, August 2018. doi:10.1109/TGRS.2018.2841882

[5] L. Huang, X. Li(\*), **B. Liu**, J. A. Zhang, D. Shen, Z. Zhang, and W. Yu. Tropical Cyclone Boundary Layer Rolls in Synthetic Aperture Radar Imagery. *Journal of Geophysical Research: Oceans*, 123, 2018. doi:doi.org/10.1029/2018JC013755

[6] L. Huang, **B. Liu**(\*), B. Li, W. Guo, W. Yu, Z. Zhang, and W. Yu. OpenSARShip: A Dataset Dedicated to Sentinel-1 Ship Interpretation. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, 2018. 11(1):195–208, January 2018. doi:10.1109/JSTARS.2017.2755672

---

<sup>1</sup>\* indicates the corresponding author.

- [7] L. Huang, **B. Liu**(\*), X. Li, Z. Zhang, and W. Yu. Technical Evaluation of Sentinel-1 IW Mode Cross-Pol Radar Backscattering from the Ocean Surface in Moderate Wind Condition. *Remote Sensing*, 2017, 9(8): 854. doi:10.3390/rs9080854
- [8] **B. Liu**, Z. Zhang, X. Liu, and W. Yu. Representation and spatially adaptive segmentation for PolSAR images based on Wedgelet analysis. *IEEE Transactions on Geoscience and Remote Sensing*, 2013. 53(9):4797–4809, September 2015. doi:10.1109/TGRS.2015.2410177
- [9] **B. Liu**, H. Hu, H. Wang, K. Wang, X. Liu, and W. Yu. Superpixel-based classification with an adaptive number of classes for polarimetric SAR images. *IEEE Transactions on Geoscience and Remote Sensing*, 51(2):907–904, February 2013. doi:10.1109/TGRS.2012.2203358
- [10] **B. Liu**, Z. Zhang, X. Liu, and W. Yu. Edge Extraction for Polarimetric SAR Images Using Degenerate Filter With Weighted Maximum Likelihood Estimation. *IEEE Geoscience and Remote Sensing Letters*, 11(12):2140–2144, December 2014. doi:10.1109/LGRS.2014.2321629
- [11] **B. Liu**, H. Wang, K. Wang, X. Liu, and W. Yu. A foreground/background separation framework for interpreting polarimetric SAR images. *IEEE Geoscience and Remote Sensing Letters*, 8(2):288–292, March 2011. doi:10.1109/LGRS.2010.2064283
- [12] **B. Liu**, H. Wang, Q. Yu, X. Liu, and W. Yu. A novel ship detection approach in polarimetric SAR images based on a foreground/background separation framework. *Chinese Journal of Electronics*, 22(3):641–647, June 2013.
- [13] S. Zhu, W. Guo, **B. Liu**(\*), Z. Zhang, and W. Yu. Detection of Inshore Containers Based on Superpixel-Level Contextual Feature. *Geomatics and Information Science of Wuhan University* (in Chinese). estimated publication date: 2019.
- [14] J. Zhao, W. Guo, **B. Liu**, S. Cui, Z. Zhang, and W. Yu. Convolutional Neural Network-based SAR Image Classification with Noisy Labels. *Journal of Radars* (in Chinese), 2017. doi:10.12000/JR16140
- [15] H. Hu, **B. Liu**, W. Guo, Z. Zhang, and W. Yu. Superpixel generation for SAR images based on DBSCAN clustering and probabilistic patch-based similarity. In: *Proceedings of 2017 IEEE International Geoscience And Remote Sensing Symposium (IGARSS 2017)*, Fort Worth, Texas, USA. July 23–28, 2017.
- [16] L. Huang, **B. Liu**, W. Guo, Z. Zhang, and W. Yu. Preliminary evaluation of vessel detectability for Sentinel-1 SAR data. In: *Proceedings of 2017 IEEE International Geoscience And Remote Sensing Symposium (IGARSS 2017)*, Fort Worth, Texas, USA. July 23–28, 2017.
- [17] H. Hu, **B. Liu**, W. Guo, Z. Zhang, and W. Yu. Preliminary Exploration of Introducing Spatial Correlation Information into the Probabilistic Patch-Based Similarity Measure. In: *Proceedings of 2017 MultiTemp Conference*, Bruges, Belgium. June 27–29, 2017.
- [18] **B. Liu**, Z. Zhang, X. Liu, and W. Yu. Region-based L0 gradient minimization for PolSAR image segmentation. In: *Proceedings of 2015 IEEE International Geoscience And Remote Sensing Symposium (IGARSS 2015)*, Milan, Italy. July 26–31, 2015.

CONFERENCE  
PUBLICATIONS

- [19] H. Hu<sup>†</sup>, **B. Liu**<sup>†</sup>, Z. Zhang, X. Liu, and W. Yu. Multi-Temporal Superpixel Generation for High Resolution SAR Image Analysis. In: *Proceedings of 2014 IEEE International Geoscience And Remote Sensing Symposium (IGARSS 2014)*, Quebec City, QC, Canada. July 13–18, 2014. (H. Hu and B. Liu contributed equally to this work.)
- [20] **B. Liu**, F. Tupin, X. Liu, and W. Yu. Extraction and characterization of buildings in urban areas via joint use of high-resolution SAR and optical imagery. In: *Proceedings of 2013 IEEE International Geoscience And Remote Sensing Symposium (IGARSS 2013)*, Melbourne, Australia. July 21–26, 2013.
- [21] W. Yu, **B. Liu**, S. Liu, Q. Sun, and T. Shu. High-performace SAR image target detection and recognition techniques. In: *Proceedings of 2012 Satellite Application Technology Symposium*, Qingdao, China. October, 2012. (in Chinese)
- [22] C. Zhu, **B. Liu**, Y. Zhou, Q. Yu, X. Liu, and W. Yu. A spy positive and unlabeled learning classifier and its application in HR SAR image scene interpretation. In: *Proceedings of IEEE 2012 Radar Conference (RadarCon 2012)*, Atlanta, GA. May 7–11, 2012.
- [23] **B. Liu**, H. Wang, K. Wang, X. Liu, and W. Yu. Scene interpretation for SAR images using supervised topic models. In: *Proceedings of 2011 IEEE International Geoscience And Remote Sensing Symposium (IGARSS 2011)*, Vancouver, Canada, July 24–29, 2011.
- [24] **B. Liu**, K. Wang, X. Liu, and W. Yu. An efficient signal processor of synthetic aperture radar based on GPU. In: *Proceedings of 2010 European Conference on Synthetic Aperture Radar (EUSAR 2010)*, Aachen, Germany. June 7–10, 2010.

#### TEACHING

Lectures on SAR processing and applications in 3S course focusing on undergraduate students, and lectures on SAR image processing focusing on graduate students and lectures on Remote Sensing Data Science for Oceanography with Deep Learning focusing on graduate students.

#### PROFESSIONAL SERVICE

##### **Guest Editor Service**

- [Remote Sensing] Special Issue - AI-based Remote Sensing Oceanography

##### **Selected Referee Service**

- IEEE TRANSACTIONS ON GEOSCIENCE AND REMOTE SENSING
- IEEE JOURNAL OF SELECTED TOPICS IN APPLIED EARTH OBSERVATIONS AND REMOTE SENSING
- IEEE GEOSCIENCE AND REMOTE SENSING LETTERS
- IEEE TRANSACTIONS ON IMAGE PROCESSING
- IEEE SIGNAL PROCESSING LETTERS
- IEEE ACCESS
- International Journal of Remote Sensing / Remote Sensing Letters
- IET Radar, Sonar & Navigation
- Canadian Journal of Remote Sensing
- CEAS Space Journal
- Geocarto International
- Chinese Journal of Electronics

##### **Conference Session Chair**

- *IEEE IGARSS 2017*, Fort Worth, Texas, USA.

#### COMPUTER SKILLS Computer Programming:

- C/C++ (GDAL, PROJ4, OpenCV, OpenMP), MATLAB, Java, Python, GNU make, SQL, L<sup>A</sup>T<sub>E</sub>X, CUDA

Remote Sensing & GIS Softwares:

- PolSARpro, SNAP, ENVI, RAT (Radar Tools), QGIS

AWARDS AND  
HONORS

- The Ph.D. dissertation “Research on Edge and Region Information Extraction for Polarimetric SAR Images” is selected by Shanghai Jiao Tong University to be submitted to The Chinese Institute of Electronics as candidates for Ph.D. Dissertation Award.
- The paper “High-performance SAR image target detection and recognition techniques” won the 2nd prize in *the 2012 Satellite Application Technology Symposium*, Qingdao, China. October, 2012.
- Shanghai Jiao Tong University
  - † Ph.D. Student
    - *State* Graduate Fellowship, 2012
    - *Qiushi* Graduate Fellowship, 2011–2012
    - PhD Student Visiting Fellowship, 2012
    - Graduate Student International Conference Fellowship, 2012
    - Academic Star of School of Electronic, Information, and Electrical Engineering, 2010–2011
    - *Bosch* PhD Fellowship, 2010–2011
    - *Pan Wen-Yuan* PhD Fellowship, 2009–2010
  - † M.S. Student
    - Graduate Student Fellowship (Rank A), 2007–2008
  - † B.S. Student
    - Outstanding Graduate Student, 2007
    - Recommended for a direct entry into graduate studies without entrance examinations (Rank 13/330 in Department of Electronic Engineering, top 5%)
    - *Far Eastern* Industries Scholarship, 2005–2006
    - Outstanding Student, 2003–2004
    - Undergraduate Student Scholarship, 2003–2004 & 2004–2005

VERSION  
INFORMATION

Last updated in *December 12, 2018*.