

# BOYING LI

🌐 <https://leeby68.github.io/> ✉ [liboying.fhyt@sjtu.edu.cn](mailto:liboying.fhyt@sjtu.edu.cn)

📍 Shanghai Jiao Tong University, Shanghai, China. ☎ +(86) 15809215299

*Computer vision, Robotics, Visual SLAM, Machine learning*

## EDUCATION

**Shanghai Jiao Tong University, China**

Sep 2016 - Jun 2023

*Ph.D. in Information & Communication Engineering*

Outstanding Graduate of Shanghai Jiao Tong University

**Northwestern Polytechnical University, China**

Sep 2012 - Jun 2016

*B.S. in Automation*

National Scholarship (Year 2013-2014 and Year 2014-2015), Top 2%

## PUBLICATIONS

- **Boying Li**, Danping Zou, Yuan Huang, Xinghan Niu, Ling Pei and Wenxian Yu, "TextSLAM: Visual SLAM with Semantic Planar Text Features." Submitted to *IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)* – Major revision.
- **Boying Li\***, Yuan Huang\*, Zeyu Liu, Danping Zou and Wenxian Yu, "StructDepth: Leveraging the structural regularities for self-supervised indoor depth estimation." *Proceedings of the IEEE/CVF International Conference on Computer Vision (ICCV)*. 2021: 12663-12673.
- **Boying Li**, Danping Zou, Daniele Sartori, Ling Pei and Wenxian Yu, "TextSLAM: Visual SLAM with Planar Text Features." *IEEE International Conference on Robotics and Automation (ICRA)*. 2020: 2102-2108.
- **Boying Li**, Bin Liu, Weiwei Guo, Zenghui Zhang and Wenxian 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 (TGRS)*, 2018, 56(8): 4887-4905.
- **Boying Li**, Bin Liu, Lanqing Huang, Weiwei Guo, Zenghui Zhang and Wenxian Yu, "OpenSARShip 2.0: A large-volume dataset for deeper interpretation of ship targets in Sentinel-1 imagery." *SAR in Big Data Era: Models, Methods and Applications (BIGSAR DATA)*. *IEEE*, 2017: 1-5.
- **Boying Li**, Bin Liu, Weiwei Guo, Zenghui Zhang and Wenxian Yu, "Ship Geometric Information Extraction for Sentinel-1 Dual-Polarization Images." *Science & Technology Review*, 2017, 35(20): 94-101.
- Lanqing Huang, Bin Liu, **Boying Li**, Weiwei Guo, Wenhao Yu, Zenghui Zhang and Wenxian Yu, "OpenSARShip: A dataset dedicated to Sentinel-1 ship interpretation." *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, 2017, 11(1): 195-208.
- Lanqing Huang, **Boying Li**, Bin Liu, Weiwei Guo, Zenghui Zhang and Wenxian Yu, "Ship Characterization and Analyses in Sentinel-1 Imagery Based on a Large and Open Dataset." *Advances in SAR Remote Sensing of Oceans*. *CRC Press*, 2018: 177-212.

## ACADEMIC EXPERIENCES

**Deep Learning in 3D Computer Vision**

2020 - Now

*Research*

- **StructDepth: the Self Supervised Depth Estimation Leveraging Indoor Structural Regularities.**
- In StructDepth, Propose Two Extra Supervisory Signals: the Manhattan Normal and the Co-planar Constraint.
- In StructDepth, Propose Two Self Supervised Components to Generate Supervisory Signals: Manhattan Normal Detection and Planar Region Detection.

- StructDepth Outperforms the State-of-the-art Methods.
- **3D Scene Reconstruction with Neural Radiance Fields (NeRF) using Semantic & Geometric Messages.**

**Visual SLAM with Semantic and Geometric Priors**  
*Research*

2018 - Now

- **TextSLAM: the First Visual SLAM System with Text Features Tightly Coupled.**
- Implemented a Visual SLAM System from Scratch as the Core Pipeline.
- In TextSLAM, Propose a Novel Parameterization & a Novel Photometric Error for the Text Features.
- In TextSLAM, Propose a Semantic Loop Closing based on Scene Text Objects.
- TextSLAM Outperforms the State-of-the-art Methods including SLAM and Visual Localization.
- **Establish a Novel SLAM & Visual Localization Dataset with Rich Semantics for the Evaluation.**

**Synthetic Aperture Radar (SAR) Imagery Interpretation**  
*National Natural Science Foundation Key Project*

2016 - 2018

- **Algorithm:** Propose a Novel Ship Size Extraction Method and Achieve the Best Performance in the World (4 Times Better than State-of-the-art Accuracy).
- **Dataset:** Build 2 SAR Ship Datasets & 1 SAR Landcover Dataset. Establish Ship Elaborate Labels for the Two SAR Ship Datasets.
- **Dataset Assessment:** Analyse the SAR polarization Characteristics based on SAR Ship datasets.

## VOLUNTEER EXPERIENCES

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**Shanghai Jiao Tong University**

2018 - 2023

- **Teaching Assistant** for 3S (RS, GPS, GIS) Technique Courses for 2 Years.
- **Chief Umpire** of the 2nd National Unmanned Aerial Vehicle Intelligent Sensing Technology Competition.
- **Popular Science Introduction** of Unmanned Aerial Vehicle, Navigation and Computer Vision for teenagers.

**Northwestern Polytechnical University**

2012 - 2016

- Vice-Minister of the Propaganda Department in the Broadcasting Station of the University News Center.
- Volunteer Teacher & Donate Books for the Children in Remote Villages.

## MAIN HONORS

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**Shanghai Jiao Tong University**

2016 - 2023

- Outstanding Graduate of Shanghai Jiao Tong University.
- Second Prize of National Post-Graduate Mathematical Contest in Modeling.
- The Scholarship of Zhou Weigan & Ren Yuehua

**Northwestern Polytechnical University**

2012 - 2016

- National Scholarship (Year 2013-2014 and Year 2014-2015), Top 2%.
- First Prize Award of Northwestern Polytechnical University (Year 2013-2014 and Year 2014-2015), Top 2%.
- Outstanding Student of Northwestern Polytechnical University (Year 2013-2014 and Year 2014-2015), Top 2%.
- Outstanding Graduate of Northwestern Polytechnical University.
- Outstanding Dissertation for Bachelor Degree of Northwestern Polytechnical University.
- Third Prize of National Mathematics China mathematics modeling network Challenge.
- Third Prize of National Innovation Creativity Entrepreneurship.

## TECHNICAL STRENGTHS

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<b>Languages</b>	fluent in English, CET-6
<b>Computer Languages</b>	Matlab, CPP, Python
<b>Frameworks</b>	PyTorch, ROS