SUN, Tao

B. Eng. in Software Engineering

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Sep 2016 – Jun 2020 (*Exp.*)

EDUCATION

Tongji University, Shanghai, China

B.Eng. in Software Engineering. (currently 4th year)

- Cumulative GPA: 4.82 / 5.00 (equivalent to 93.2 / 100)
- Ranking: 2 / **185** (top 1.1%)
- Related Courses and Scores: Data Mining & Analysis (A), Object-Oriented Programming (A), Data Structures (A), Design and Analysis of Algorithms (A) Operating System (A), Database System Principles (A), Compiler Principle (A), Computer Architecture (A), Computer Networks (A).

RESEARCH

Facebook Maps Team, Facebook Inc.

Feb 2019 - Present

EXPERIENCE

Research Assistant (remotely). Supervised by Research Scientist Dr. Saikat Basu and Dr. Guan Pang.

- Project: Topological-Aware Loss Function for Detecting Linear Structures from Image
- Propose a new loss function to punish the fragmented prediction for linear structures, which reduces the total variance in the patches of linear structures.
- » Improve results for road extraction, land segmentation and cell boundary detection on topological metrics.
- Keywords: Image Segmentation, CNN, Structure-Aware CNN
- Highlight: Submitted 1 paper to *CVPR 2020*

Deep Learning Lab, Tongji University

Mar 2018 - Sep 2019

Undergraduate Research Student. Supervised by Prof. Yin Wang.

- Project: Road Extraction from Satellite Imagery
- » Design new stacked U-Net architecture with outputs for both road segment and intersections.
- Propose original road extraction approach that utilizes both massive GPS trajectories and satellite images.
- Integrate new 1D transposed convolution, GPS argumentation and rendering methods which enable our approach achieve 5% higher accuracy and 40% boost in generalization ability when predicting new area.
- Keywords: Image Segmentation, CNN, Image Processing, Weakly-Supervised Learning, Point-based CNN
- Highlight: Published 3 papers as the first author, including CVPR, ACM SIGSPARIAL Workshop and CVPRW papers

X-Lab (Lab for Intelligent Operation and Maintenance), Tongji University Sep 2018 - Jan 2019 Undergraduate Research Student. Supervised by Prof. Qingfeng Du and Dr. Juan Qiu.

- Project: Time-Series Anomaly Detection for Operation and Maintenance of Cloud Services
- Propose a novel method that combines LSTM with VAE for anomaly detection from imbalanced performance index data from online servers.
- Keywords: Time-Series, LSTM, VAE, GMM
- Highlight: Applied for 1 Chinese Patent

Interests: Computer Vision, Deep Learning, Explainable AI, Weakly-/Un- Supervised Learning

PUBLICATION Conference Paper

[1] T. Sun, Z.-L. Di, P.-Y. Che, C. Liu, and Y. Wang, "Leveraging Crowdsourced GPS Data for Road Extraction from Aerial Imagery", in Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR), Long Beach, CA, USA, 2019. Link

Workshop Paper

- [1] T. Sun, Z.-H. Chen, W.-X. Yang, Y. Wang, "Stacked U-Nets with Multi-Output for Road Extraction", in Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition Workshops (CVPRW), Salt Lake City, UT, USA, 2018.
- [2] T. Sun, Z.-L. Di and Y. Wang, "Combining Satellite Imagery and GPS Data for Road Extraction", in Proceedings of the ACM SIGSPATIAL International Workshop on AI for Geographic Knowledge Discovery (GeoAI), Seattle, WA, USA, 2018. (Oral) Link

ACADEMIC SERVICES	Reviewer ■ IEEE JSTSRS (Journal of Selected Topics in Applied Earth Observations and Remote Sensing, IF: 3.4), reviewed 1 submission. Jan 2019	
	 ACM SIGSPATIAL 2019, reviewed 6 submissions (as Sub-Reviewer) 	Jul 2019
SELECTED PROJECTS	Data Mining & Analysis, Course Project, Tongji UniversityMar 2018 − Jun 2018Discovery the Frequent Patterns of Online Shopping Data. Supervised by Prof. Weixiong Rao• Keywords: GCN (Graph Convolution Network), Frequent Pattern Set, Decision Tree, Feature Embedding	
	 Data Warehouse, Course Project, Tongji University Amazon Movie: Knowledge Graph. Supervised by A/Prof. Hongmin Zhu. Design Spark and Neo4j programs that mine the graph information of Amazon Movies. 	Sep 2018 – Jan 2019 ie dataset.
	 Human-Computer Interaction, Course Project, Tongji University Gaze Control: Eye Gaze Detection API. Supervised by A/Prof. Ying Shen. Detecting eye pupils location and heading in 3D space using OpenCV and reconstruscreen. 	Sep 2017 – Jan 2018 ucting the gaze point at the
	 Are You Feeling Tired?, National SITP Project Granted by the <i>National Students Innovation Training Program (SITP) of China</i> Develop mobile App to help people custom their working schedule corresponding to 	Apr 2017 – <i>Present</i> their biological rhythm.
CAMPUS ACTIVITIES	Dept. of Academic and Culture Promotion , Students Union of Tongji University President	Sep 2016 – Jun 2018
	 Inviting famous scholars and industry experts to give lectures at the campus. Working with the Department members to organize lectures. Maintaining online accounts of the Department. The WeChat account has nearly 10kg. 	s subscribers.
AWARDS & SCHOLARSHIPS	• National Scholarship , China's Ministry of Education For top 0.2% undergraduate students nationwide.	2018 Fall – 2019 Spring
	 National Scholarship, China's Ministry of Education 	2017 Fall – 2018 Spring
	• Student Scholarship, First Class , Tongji University For top 5% students in the university.	2016 Fall – 2017 Spring
	• Special Prize in 16 th "Challenge Cup" National College Student Curricular Academic Science and Technology Works Competition (in Chinese: "挑战杯"), Shanghai's Ministry of Education 2019	
	 Honorable Mention in 2018 Mathematical Contest in Modeling, COMAP 	2018
	• First Prize in $33^{\rm rd}$ China College Students Physics Contest, Shanghai, Chinese Physical Society. 2016	
LANGUAGE PROFICIENCY	 Chinese (Mandarin): Native language. English: Fluent. TOEFL: 107 (Reading: 29, Listening: 30, Speaking: 23. Writing: 25) GRE: 323 (Verbal: 153, Quant: 170, AW: 4.0) 	
SKILLS	Programming ■ Proficient: Python, C, C++ ■ Intermediate: JavaScript, Java, Swift, SQL, MATLAB	
	Research Machine Learning: PyTorch, Keras, TensorFlow, Pandas, Sk-Learn, OpenCV Academic Writing: TEX, LATEX	
	 General Developing: Xcode, Visual Studio, MySQL, Spark Multimedia & Design: Adobe Photoshop, Adobe Lightroom, Autodesk AutoCA Office: Microsoft Word, Microsoft Excel, Microsoft PowerPoint, Microsoft Acc 	