

SUN, Tao

B. Eng. in Software Engineering

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EDUCATION	Tongji University , Shanghai, China B.Eng. in Software Engineering. (currently 4 th year) <ul style="list-style-type: none">▪ Cumulative GPA: 4.82 / 5.00 (equivalent to 93.2 / 100)▪ Ranking: 2 / 185 (top 1.1%)▪ Related Courses and Scores: <i>Data Mining & Analysis (A), Machine Learning (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).</i>	Sep 2016 – Jun 2020 (<i>Exp.</i>)
RESEARCH EXPERIENCE	Facebook Maps Team , Facebook Inc. Research Intern (remotely). <i>Supervised by Research Scientist Dr. Saikat Basu and Dr. Guan Pang.</i> <ul style="list-style-type: none">▪ Project: Topological-Aware Loss Function for Detecting Linear Structures from Image<ul style="list-style-type: none">» 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 <i>CVPR 2020</i>	Feb 2019 – Present
	Deep Learning Lab , Tongji University Undergraduate Research Student. <i>Supervised by Prof. Yin Wang.</i> <ul style="list-style-type: none">▪ Project: Road Extraction from Satellite Imagery<ul style="list-style-type: none">» 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 <i>CVPR</i>, <i>ACM SIGSPATIAL Workshop</i> and <i>CVPRW</i> papers	Mar 2018 – Sep 2019
	X-Lab (Lab for Intelligent Operation and Maintenance) , Tongji University Undergraduate Research Student. <i>Supervised by Prof. Qingfeng Du and Dr. Juan Qiu.</i> <ul style="list-style-type: none">▪ Project: Time-Series Anomaly Detection for Operation and Maintenance of Cloud Services<ul style="list-style-type: none">» 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	Sep 2018 – Jan 2019
Interests: <i>Computer Vision, Deep Learning, Explainable AI, Weakly-/Un- Supervised Learning</i>		
PUBLICATION	Conference Paper <ul style="list-style-type: none">[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 <i>Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR)</i>, Long Beach, CA, USA, 2019. Link Workshop Paper <ul style="list-style-type: none">[1] T. Sun, Z.-H. Chen, W.-X. Yang, Y. Wang, “Stacked U-Nets with Multi-Output for Road Extraction”, in <i>Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition Workshops (CVPRW)</i>, Salt Lake City, UT, USA, 2018. Link[2] T. Sun, Z.-L. Di and Y. Wang, “Combining Satellite Imagery and GPS Data for Road Extraction”, in <i>Proceedings of the ACM SIGSPATIAL International Workshop on AI for Geographic Knowledge Discovery (GeoAI)</i>, Seattle, WA, USA, 2018. (Oral) Link	

ACADEMIC SERVICES	Reviewer <ul style="list-style-type: none"> ▪ IEEE JSTARS (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	<p>Data Mining & Analysis, Course Project, Tongji University Mar 2018 – Jun 2018 Discovery the Frequent Patterns of Online Shopping Data. <i>Supervised by Prof. Weixiong Rao</i></p> <ul style="list-style-type: none"> ▪ Keywords: GCN (Graph Convolution Network), Frequent Pattern Set, Decision Tree, Feature Embedding <hr/> <p>Data Warehouse, Course Project, Tongji University Sep 2018 – Jan 2019 Amazon Movie: Knowledge Graph. <i>Supervised by A/Prof. Hongmin Zhu.</i></p> <ul style="list-style-type: none"> ▪ Design Spark and Neo4j programs that mine the graph information of Amazon Movie dataset. <hr/> <p>Human-Computer Interaction, Course Project, Tongji University Sep 2017 – Jan 2018 Gaze Control: Eye Gaze Detection API. <i>Supervised by A/Prof. Ying Shen.</i></p> <ul style="list-style-type: none"> ▪ Detecting eye pupils location and heading in 3D space using OpenCV and reconstructing the gaze point at the screen. <hr/> <p>Are You Feeling Tired?, National SITP Project Apr 2017 – Present Granted by the <i>National Students Innovation Training Program (SITP) of China</i></p> <ul style="list-style-type: none"> ▪ Develop mobile App to help people custom their working schedule corresponding to their biological rhythm.
CAMPUS ACTIVITIES	<p>Dept. of Academic and Culture Promotion, Students Union of Tongji University Sep 2016 – Jun 2018 President</p> <ul style="list-style-type: none"> ▪ 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 10k subscribers.
AWARDS & SCHOLARSHIPS	<ul style="list-style-type: none"> ▪ National Scholarship, China's Ministry of Education 2018 Fall – 2019 Spring For top 0.2% undergraduate students nationwide. ▪ National Scholarship, China's Ministry of Education 2017 Fall – 2018 Spring ▪ Student Scholarship, First Class, Tongji University 2016 Fall – 2017 Spring For top 5% students in the university. ▪ Special Prize in 16th "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 33rd China College Students Physics Contest, Shanghai, Chinese Physical Society. 2016
LANGUAGE PROFICIENCY	<ul style="list-style-type: none"> ▪ Chinese (Mandarin): Native language. ▪ English: Fluent. <ul style="list-style-type: none"> » TOEFL: 107 (Reading: 29, Listening: 30, Speaking: 23, Writing: 25) » GRE: 323 (Verbal: 153, Quant: 170, AW: 4.0)
SKILLS	<p>Programming</p> <ul style="list-style-type: none"> ▪ Proficient: Python, C, C++ ▪ Intermediate: JavaScript, Java, Swift, SQL, MATLAB <p>Research</p> <ul style="list-style-type: none"> ▪ Machine Learning: PyTorch, Keras, TensorFlow, Pandas, Sk-Learn, OpenCV ▪ Academic Writing: \LaTeX, \LaTeX <p>General</p> <ul style="list-style-type: none"> ▪ Developing: Xcode, Visual Studio, MySQL, Spark ▪ Multimedia & Design: Adobe Photoshop, Adobe Lightroom, Autodesk AutoCAD, Autodesk Inventor ▪ Office: Microsoft Word, Microsoft Excel, Microsoft PowerPoint, Microsoft Access