

# Tianyi Song

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## PROFILE

- Extensive practical experience in computer vision and multimodal

## EDUCATION

9/2021-7/2024	<b>Southeast University (SEU)</b> <i>Master of Engineering, majoring in Electronic Information</i> GPA: 3.8/4.0, Average Score: 89.64/100, Top 5% Relevant Courses: Numerical Analysis, Analysis of Complex Networks and Social Networks, Artificial Intelligence and Machine Learning, Pattern Recognition, Algorithm Design and Analysis	Nanjing, China
9/2017-7/2021	<b>Nanjing University of Posts and Telecommunications (NJUPT)</b> <i>Bachelor of Engineering, majoring in Communication Engineering</i> GPA: 3.64/4.0, Average Score: 86.77/100, Top 20% Relevant Courses: Mathematical Analysis, Numerical Analysis, Communication Principles, Signals and Systems, Analog Circuits, Digital Circuits, Computer Communication Network, Wireless Communications Principles, Digital Signal Processing, Optical Fiber Communication System	Nanjing, China

## RESEARCH PROJECTS

1/2023-8/2023	<b>Project Title:</b> Continuous Story Visualisation <b>Paper Name:</b> <i>Causal-Story: Local Causal Attention Utilising Parameter-Efficient Tuning for Visual Story Synthesis</i> <b>First Author</b> <b>Main Responsibilities:</b> <ul style="list-style-type: none"><li>• Designed a local causal attention mask combined with latent diffusion to improve the model's judgment of contextual causal relationships; proposed a lightweight adapter for efficient parameter tuning</li></ul> <b>Outcomes:</b> The model obtained SOTA FID scores on the PororoSV and FlintstonesSV datasets Accepted for publication at 2024 IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP 2024)
3/2023-8/2023	<b>Project Title:</b> Image Shadow Removal <b>Paper Name:</b> <i>Deshadow-Anything: When Segment Anything Model Meets Zero-Shot Shadow Removal</i> <b>Second Author</b> <b>Main Responsibilities:</b> <ul style="list-style-type: none"><li>• Devised an adaptive input perturbation strategy specifically tailored to accelerate the iterative training of the diffusion model in the task of removing shadows from images using a diffusion model</li></ul> <b>Outcomes:</b> The optimised diffusion model performed well on the ISTD/SRD dataset <b>Arxiv Link:</b> <a href="https://arxiv.org/abs/2309.11715">https://arxiv.org/abs/2309.11715</a> (work in progress)

## ACADEMIC PROJECTS

6/2023-6/2024	<b>Interactive Chinese-style Face Image Generation for Open-Ended Text (Master's Graduation Design)</b> <b>Independent Researcher</b> Nanjing, China <ul style="list-style-type: none"><li>• Constructed a Chinese text-Chinese face image dataset specifically for text-to-image tasks</li><li>• Designed a multi-layer diffusion model to achieve the high-definition and high-quality generation of face images by fusing text features and image features</li><li>• Developed a dynamic memory network to enable interactive modifications of generated face images</li></ul>
12/2022-5/2023	<b>Twin Modeling Techniques for Typical Abnormal Scenarios</b> <b>Student Member</b> Nanjing, China <ul style="list-style-type: none"><li>• Conducted an investigation into the existing abnormal issues in power grid control systems and categorised and summarised their characteristics</li><li>• Classified data anomalies in power grid control systems into three types, including data submission anomalies, parameter configuration anomalies, and data fluctuations, based on the peculiarities of data anomalies</li><li>• Completed the project proposal and technical report for the data anomaly analysis and warning system in the power grid control system</li></ul>
12/2020-6/2021	<b>Sports Image Scene Recognition based on Convolutional Neural Networks (Undergraduate's Graduation Design)</b> <b>Independent Researcher</b> Nanjing, China <ul style="list-style-type: none"><li>• Constructed a scene dataset specifically for sports-related scenarios</li><li>• Trained the model on the dataset by utilising ResNet50 and achieved an optimised Top-5 accuracy of 85.08% on the test set</li></ul>

	<ul style="list-style-type: none"> <li>Developed a simple prototype system by leveraging the Django framework in Python, and this system allowed image uploading, backend recognition, and frontend display of the recognition results for the trained sports scene recognition model</li> </ul>	
5/2019-6/2020	<b>Mechanical Instrument Information Acquisition System</b> <b>Leader</b> <ul style="list-style-type: none"> <li>Utilised YoloV5 for object detection in instrument images and employed the OpenCV library for image processing, aiming to enhance recognition accuracy</li> <li>Designed a set of algorithms for instrument pose estimation and correction (based on Hough detection) to address potential issues of tilting and rotation during image capture</li> <li>Completed the writing and application for a utility model patent titled ‘An Instrument Information Collector Based on Image Recognition’ (The patent has been granted and approved)</li> </ul>	Nanjing, China
1/2018-2/2018	<b>Short-term Visiting Program</b> <ul style="list-style-type: none"> <li>Completed the short-term visiting program at Stanford University and the University of California, Berkeley</li> <li>Undertook relevant courses in the field of computer science, covering image recognition, semantic segmentation and NVIDIA frontier end-sharing meeting</li> </ul>	San Francisco, U.S.

## PATENTS

### Utility Model Patents:

05/2020	An instrument information collector based on image recognition
05/2020	A highly sensitive, large-sized screen touch gesture capturing device
05/2020	A three-dimensional scene remote controller designed for Android smartphones

## INTERNSHIP EXPERIENCE

7/2023-9/2023 & 7/2022-9/2022

<b>Nanjing Research Institute, Huawei Technologies Co., Ltd.</b> <b>Algorithm Engineer (Intern)</b> <ul style="list-style-type: none"> <li>Participated in the IPCA project’s white-box testing initiative, where I built the project using CMake and utilised the gtest/mockcpp framework for conducting white-box tests</li> </ul>	Nanjing, China
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## AWARDS

10/2023	Kaggle LLM Science Exam, Bronze Medal, 241/2664 TOP 10%	Nanjing, China
10/2022	First-class Scholarship, SEU	Nanjing, China
10/2022	Three Good Graduate Student Title, SEU	Nanjing, China
8/2022	Second Prize from Jiangsu Post-Graduate Mathematical Contest in Modelling	Nanjing, China
10/2021	Second-class Scholarship, SEU	Nanjing, China
11/2019	First Prize, China Undergraduate Mathematical Contest in Modelling	Nanjing, China
9/2019	Award for Excellence in Social Work, NJUPT	Nanjing, China
9/2018	Spiritual Civilisation Award, NJUPT	Nanjing, China
9/2018	Third-class Scholarship, NJUPT	Nanjing, China

## EXTRACURRICULAR ACTIVITY

9/2018-9/2019	<b>News and Publicity Department, Student Union, School of Communication and Information Engineering</b> <b>Student Leader</b> <ul style="list-style-type: none"> <li>Organised and coordinated various major events at the School of Communication and Information Engineering</li> <li>Recorded and documented event proceedings and prepared news articles</li> <li>Captured photographs during events for promotional and archival purposes</li> <li>Operated and managed the College’s official website</li> </ul>	Nanjing, China
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## ADDITIONAL SKILLS

### IT SKILLS

Basic- Python, C++, C, MATLAB, and SPSS

Proficient in both the PyTorch and TensorFlow frameworks and possessed a good understanding of various deep learning models, such as diffusion models, generative adversarial networks (GANs), and convolutional neural networks (CNNs)

### LANGUAGES

Chinese: Native

English: Fluent (IELTS 7)

### CERTIFICATIONS

National Computer Rank Examination, Certificate of Level 2