

# Aleksandr Tsoy

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## Education

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**Tsinghua University**, MS in Data Science Sep 2021 – May 2024

- GPA: 3.6/4.0
- **Coursework:** Machine Learning, Learning from Data, Computational Photography
- **Thesis:**

**Yanbian University**, BEng in Mechanical Engineering & Automation Sep 2017 – May 2021

- GPA: 3.4/4.0
- **Coursework:** AutoCAD Mechanical Drawing, Robotics, Calculus, Circuits Theory

## Experience

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**AI Algorithm Engineer @ SolaX Power** Jul 2025 - Sep 2025

- Developed a novel deep learning architecture by integrating a custom **attention mechanism** with a **Bidirectional LSTM (BiLSTM)** for advanced fault detection in photovoltaic (PV) systems.
- Achieved **96% test accuracy** and **98% validation accuracy** in classifying I-V curve fault types, utilizing a large dataset of real-world operational data.

**Junior Image Algorithm Engineer @ Aqara - Lumi United Technology** Oct 2024 - Jun 2025

- Conducted testing and benchmarking of open-source multimodal models, including Qwen-VL, InternVL, and LLaVA and so on, using **vllm** and **snglang** for high-performance serving
- Hands-on experience in fine-tuning Multimodal Large Language Models (MLLMs) using techniques such as **LoRA** and **QLoRA**
- Built a video semantic search pipeline leveraging **Redis** for video queue management and **vllm** for serving MLLMs,

**ML/AI Engineer, Intern @ Bimi Boo Kids** Feb 2024 – Aug 2024

- Implemented a local **LLM chatbot** using **RAG**, **MongoDB**, and OpenWebUI to streamline business processes
- Developed an image-search tool utilizing the **Computer Vision (CLIP model)**, enabling efficient image search by description and significantly decreasing the time spent searching for an image by name
- **Integrated and fine-tuned AIGC** models for image generation with open-source solutions like **StableDiffusion** and Automatic1111, optimizing illustration processes and reducing turnaround times

**Teaching Assistant @ Tsinghua University** Sep 2022 – Jan 2024

- Graded assignments, quizzes, and exams for Academic English course, ensured fair and consistent evaluation in line with established grading criteria. Provided accurate assessments of students work
- Managed and maintained accurate records of student grades, attendance, and participation for 60 student, streamlining the administrative process for the course

## Publications

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**SPIE: Robust human joint positioning with a single-pixel detector | Conference Paper** Dec 2024

**Optics Letters (IF 3.56): Image-free Single-pixel Key Points Detection for Privacy Preserving Human Pose Estimation | International Journal Paper** Feb 2024

**ChiItaly 23': VisionARy: Exploratory research on Contextual Language Learning using AR glasses with ChatGPT | International Conference Paper** May 2023

**SPIE: GAN-SRSPi: super-resolution single-pixel imaging using generative adversarial networks | Conference Paper** Apr 2023

**SPIE: Ultra-efficient single-pixel tracking and imaging of moving objects based on geometric moment** | **Conference Paper**

Apr 2023

## Projects

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### CV & Optics | Image-free Single-pixel sensing

Oct 2022 - Mar 2024

- Developed **Convolutional Neural Network (CNN)** for Image-Free Classification. Using a **binary classifier** the model is able to classify MNIST digits based on pixel intensities
- Developed **Deep Neural Network model** for Image-free Single Pixel Keypoint Detection for Human Pose Estimation utilizing **Keypoint RCNN**. Network achieved high accuracy with minimal sampling ratio
- Developed **Deep Neural Network model** for Noise Robust Image-free single pixel imaging Keypoint Estimation utilizing **YOLO-v8**. Model achieved high accuracy in the noisy environment

### AR & CV & LLM | VisionARY: Contextual Language Learning using AR glasses with ChatGPT

Sep 2023

- Integrated **tiny YOLO-v7 with AR Glasses** to detect and label surrounding objects
- Developed an **Android application** to provide an optimal user interface experience for AR Glasses users, including designing buttons, functionality, and a color palette

### AR & CV | Museum AI

Aug 2023

- Implemented **OCR algorithms to AI Glasses** for accurate text extraction from exhibit descriptions
- Integrated the **Large Language Model with pre-defined prompt** for detailed translation of extracted text, followed by generation and explanation of the showpiece

### Big Data | Taishin Bank Commercial Big Data Competition

Sep 2021 - Apr 2022

- Engineered models to forecast next-year fund and credit purchases using 230,000 consumption records
- **Fine-tuned the XGBoost model, optimizing model parameters** to achieve improved predictive accuracy and performance

## Honors & Awards

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### Optica Publishing Group Reviewer Recognition

Feb 2025

Recognized for dedication to quality scientific peer review in 2024.

### Shenzhen Universiade International Scholarship Foundation (SUISF)

Sep 2023

Awarded the SUISF Scholarship for outstanding academic and research excellence

### Finalist at the 6th Global Competition on Design for Future Education

Aug 2023

Achieved Finalist position in the 6th Global Competition on Design for Future Education, ranking 4th among 170 participants for innovative project design

### The Sustainable Development Goals (SDGs) University Program

Sep 2022

Recognized as the Most Innovative Team in the SDG Program, demonstrating exceptional creativity and problem-solving skills in sustainable development

### Introduction to Machine Learning by Duke University

May 2021

Completed 'Introduction to Machine Learning' from Duke University

### Outstanding International Student Representative

Mar 2021

Selected as Outstanding International Student Representative for exemplary academic and extracurricular contributions

## Skills

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**Languages:** Russian - native, English – fluent, Chinese - professional working, Korean - professional limited

**ML/AI:** Computer Vision, Large Language Model, Large Language Visual Model, Retrieval Augmented Generation

**Programming:** Python, Pytorch, Numpy, Pandas, Matplotlib, TensorFlow