

# Zhpwang Wang

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## Education

- **Bachelor of Science in Physics** **Lanzhou, China**  
*Lanzhou University* *September 2020 – Current*  
GPA: 84.61/100; Rank: 4/20 in base class (class of National Basic Science Talent Training Base)  
**Major courses:** Computational Physics, Methods of Mathematical Physics, Optoelectronic Technology and Its Applications, AI and Big Data, Fourier optics, Theoretical Mechanics, Thermodynamics and Statistical Physics, Quantum Mechanics, Electrodynamics

## Research/Projects Experience

- **Solving an NP problem by means of Quantum Optics** *December 2022 – June 2023 (expected)*  
*School of ECE, Purdue University (Online)*
  - **Introduction:** The project plan aims to tackle some typical NP problems (such as the MAX-CUT problem) by utilizing optical parametric oscillators (OPOs) or OPO networks. The proposed approach involves abstracting the target problem as an Ising spin system and then using OPO (networks) to search the Hamiltonian ground state energy to solve the target problem.
  - **Project Progress:** Following the idea proposed in the paper to build a neural network using TensorFlow and train it in colab, the target effect was successfully reproduced (the training trend was the same as the effect in the paper) and the prediction could be successfully made.
- **Reproduction of optical design projects based on reverse learning** *April 2022 – March 2023*  
*School of Physical Science and Technology*
  - **Introduction:** The goal of this project is to replicate the findings of an article authored by Yu Zongfu's team. When we encounter a partial optical structure with corresponding electromagnetic correspondence, we will employ a tandem architecture that combines forward modeling and inverse design to create an optical system.
  - **Project Progress:** By following the approach suggested in the paper, we constructed a neural network using TensorFlow and trained it in Google Colab. We successfully replicated the desired effect (the training trend closely matched that reported in the paper) and were able to make accurate predictions.
- **Palm print identification** *November 2021 – March 2022*  
*School of Information Science and Engineering*
  - **Introduction:** This project utilizes publicly available datasets to develop a palmprint identification system that aims to achieve high accuracy in distinguishing the owner of a given palmprint, which is a practice project for learning neural networks.
  - **Project Progress:** After conducting extensive research, I discovered that SVM can be effectively utilized to identify palm prints captured by fixed cameras under consistent lighting conditions, with an accuracy rate exceeding 97%. However, the performance of SVM deteriorates significantly in complex environments.
- **Exploration of the nature and causes of candle flame oscillator** *October 2020 – September 2021*  
*School of Physical Science and Technology*
  - **Introduction:** In this project, we aim to investigate the coupling conditions and underlying causes of flame oscillations when several candles are burning in close proximity to one another.
  - **Project Progress:** After reviewing the relevant literature and deriving the necessary theoretical framework, we utilized OpenCV and a thermometer to collect experimental data that closely aligned with the proposed theory.
  - Participated in China Undergraduate Physics Tournament (Northwest Region) as a tournament topic and won the first prize in June 2021.

## Awards

- **China Undergraduate Physics Tournament (Northwest Region)** **First Prize**  
*As a contestant* *June 2021*
- **China Undergraduate Physics Tournament (Northwest Region)** **Second Prize**  
*As a team leader* *July 2022*

## Computer skills

I possess a solid understanding of programming languages, including **C/C++**, **Matlab**, and **Python**, and have some experience using popular Python libraries like **NumPy**, **Pandas**, **OpenCV**, **TensorFlow**,