

# Deren Zhang

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Github: <https://github.com/DerenZhang>

## Education

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### Electrical and Computer Engineering + PEY Co-op

University of Toronto, Toronto, ON

Sep. 2022 - Apr. 2027

- Relevant Courses: Engineering Strategies & Practice, Computer Graphics, Applied Fundamental of Deep Learning (Python), Algorithm and Data Structure, Computer Networks
- Areas of focus: Software Engineering & Computer Networks, minor in Engineering Business

## Personal Summary

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I am passionate about the applications of deep learning models in real-world challenges. I am familiar with the mechanisms of mainstream architectures like ANN, CNN, VAE, RNN (variants of RNN, LSTM, GRU), GAN, Transformers and GNN and regularization methods. During academic projects, I focused on data augmentation, fine-tuning pre-trained CNN models (RESNET-50, VGG-19) using transfer learning. I also applied regularization techniques and backbone modification to reduce overfitting.

## Skills

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- Programming: C, C++, Python
- Software Development: React, UDP/TCP socket programming (C)
- Machine Learning & Data Science: PyTorch, NumPy, Pandas, Matplotlib
- Tools & Environments: Linux, Git, GitHub, MATLAB, LaTeX, Microsoft Office
- Language: English & Mandarin

## Projects & Experience

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### GIS Software Development | University of Toronto, Toronto, ON

Jan. 2024 - May 2024

Led a team of 3 and developed a GIS software using C++ with features similar to Google Maps. Learned how to use StreetDatabaseAPI and OSM database API. Implemented unit tests to ensure code functionality and speed. Created a user interface with EZGL and Glade. Applied Dijkstra's algorithm for shortest pathfinding function.

### Deep Learning Engineering | University of Toronto, Toronto, ON

May 2025 - Now

Developed an aircraft classifier using convolutional neural networks (CNN). Modified existing models (VGG-19, ResNet-50) by integrating a Spatial Pyramid Pooling (SPP) layer before fully connected layers. Followed a standard ML workflow including data augmentation, train/val/test dataset splitting, baseline setup, hyperparameter tuning, performance benchmark, and final presentation delivery. Accuracy on test dataset improved from 40% (baseline model) to 65% (ResNet-50).

### TCP Application Development | University of Toronto, Toronto, ON

Sept. 2025 - April 2025

Developed a multi-client chat system using TCP sockets in C, supporting real-time messaging, session-based chat rooms, and user authentication. Implemented private messaging, session invitations, and command parsing (e.g., /login, /invite, /private) using a custom protocol. Managed multiple connections using select().

