

# Daniel Guo

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## TECHNICAL SKILLS

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**Languages:** Java, Python, C/C#, Racket, HTML/CSS

**Frameworks:** PyTorch, TensorFlow, Scikit-Learn, YOLO, CUDA, LangChain, React, Django

**Developer Tools:** Git, Docker, Jupyter Notebook, Google Cloud Platform, VS Code, Pyserini

**Libraries:** Hugging Face, OpenCV, pandas, NumPy, Matplotlib, Seaborn

## EXPERIENCE

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### Undergraduate Research Assistant

Feb. 2025 – Present

*University of Waterloo*

*Waterloo, ON*

- Implemented key features to Pyserini toolkit that allowed for sparse vector encoding via commands
- Reproduced and updated old research papers' model evaluation data with newer model and corpora
- Developed customizable script with multiprocessing GPU and CUDA for increased efficiency in encoding corpora

### Founder

Apr. 2023 – Present

*CyberNova Collective*

- Created public educational seminar event with over 7 university professors with 350+ students attending
- Partnered with other organizations to create Galaxy One Hackathon with 375 participants

### Technology Assistant

Aug. 2023 – Sep. 2023

*QuickPOS Technologies Inc.*

*Richmond Hill, ON*

- Assisted with the installation and configuration of 10+ hardware devices and software systems
- Provided technical support and debugging to over 20 customers to resolve issues
- Assisted in editing and updating the QuickPOS website and menus for various restaurants on Wix

### Lead Organizer

Jan. 2023 – May 2023

*BxMCTF*

- Organized international cybersecurity competition with over \$20k worth of prizes from sponsors, 900+ teams (3000+ people) participated
- Assisted in building and maintaining the competition website while developing diverse CTF problems
- Developed multiple sponsorship packages, successfully securing sponsors from businesses and universities

## PROJECTS

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### SudokuVision | *Python, OpenCV, TensorFlow, Django*

Jan. 2025 – Present

- Developed a full-stack web application using with Django running backend AI logic
- Trained a LuNet model (with CNN + NN layers) on an image dataset of digital numbers with 90%+ accuracy
- Developed custom backend AI with OpenCV that locates sudoku puzzle in the image and then classifies the digits
- Implemented backtracking algorithm to automatically solve the puzzle with the detected digits

### CheckMate | *LangChain, Hugging Face, React, Google Cloud, Chrome API, Django, Git*

Oct. 2024 – Dec. 2024

- Developed a Chrome extension with Django backend for interacting with Chrome Gemini API
- Created prompts for Gemini/other models to check the credibility of the page's contents
- Streamed LLM output with LangChain from Django to front-end React

### Laptop Price Predictor | *Python, Scikit-Learn, Jupyter Notebook, pandas, matplotlib, Seaborn*

- Trained a Random Forest Regressor model on a Kaggle dataset containing mixed data to predict laptop prices
- Effectively preprocessed data through one-hot encoding, feature extraction, and numerical standardization
- Performed feature selection by analyzing correlations with price using Seaborn heatmaps and pandas
- Evaluated model performance, achieving an  $R^2$  score of 0.83, and visualized predictions to assess accuracy

### PDFChat | *Python, LangChain, Hugging Face*

- Developed a Python-based chatbot using RAG with LangChain for interactive conversations with PDF files
- Utilized LangChain and FAISS for document loading, retrieval, embeddings, and vector database creation
- Engineered a QA system combining a vector store retriever and LLM-based response generation

## EDUCATION

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### University of Waterloo

*Bachelor of Computer Science, Computer Science - Cumulative GPA: 4.0*

Waterloo, ON

*Sep. 2024 – June 2029*