

# Chengharv Pen

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## EDUCATION

### Concordia University

*Bachelor of Science in Computer Science*

Montreal, QC

Sept. 2023 – Present

- Relevant Courses: Machine Learning, Deep Learning, Big Data Analytics, Computer Networks
- GPA: 3.48/4.30

## PROJECTS

### Brain-to-Text CNN–Transformer | *Python, PyTorch, Scikit-learn, Docker, GCP, Matplotlib, Seaborn*

- Designed and implemented multiple CNN–Transformer architectures to replace a baseline RNN for neural-signal to phoneme transcription, improving feature extraction and long-range sequence modeling.
- Integrated the new models directly into an existing research codebase, restructuring data pipelines, training loops, and evaluation interfaces for compatibility and reproducibility.
- Built a reproducible Docker environment and mirrored the configuration on GCP VM instances, ensuring consistent execution across local and cloud systems.

### 50-Object Classifier | *Python, PyTorch, Scikit-learn, NumPy, Pandas, Matplotlib, Seaborn*

- Engineered a 3-layer MLP architecture using Xavier initialization, Batch Normalization, Dropout, and GELU activations to stabilize training and improve generalization.
- Built a full training pipeline without high-level frameworks, using Cross-Entropy loss with label smoothing, gradient clipping, K-Fold validation, random search, and metric tracking.
- Analyzed learning curves, confusion matrices, and misclassified samples to guide architecture refinements and diagnose generalization gaps.

### Recommender System | *Python, Scikit-learn, NumPy, Pandas, Matplotlib, Seaborn*

- Developed a product recommender using cosine similarity on a user-user matrix to generate personalized top-N suggestions.
- Applied the Apriori algorithm to discover frequent itemsets and derive actionable association rules to support product bundling strategies.
- Performed user segmentation with K-Means clustering to uncover behavioral groups and improve recommendation personalization.

### Social Network Website | *HTML, CSS, JavaScript, PHP, MySQL, Git*

- Developed a full-featured social networking platform with user profiles, posts, chat messaging, friend relationships, and group functionality.
- Designed and optimized database schemas to ensure fast, real-time data retrieval across dynamic features.
- Implemented Role-Based Access Control (RBAC) to securely manage permissions for admins and standard users.

## EXPERIENCE

### Crew Member

*McDonald's*

June 2023 – Jan 2024

Saint-Eustache, QC

- Worked in a fast-paced, high-pressure environment requiring multitasking and strict time constraints.
- Collaborated within a team to adapt quickly to changing priorities and workload demands.
- Followed standardized procedures while maintaining attention to detail and safety compliance.

## TECHNICAL SKILLS

**Languages:** Python, Java, SQL (Postgres/MySQL), C/C++, JavaScript, TypeScript, PHP, HTML/CSS

**Libraries:** PyTorch, Scikit-learn, OpenCV, Pandas, NumPy, Matplotlib, Seaborn

**Web Frameworks:** React, Angular, Express, Spring Boot

**Developer Tools:** Git, Docker, GCP (Compute Engine), Postman, Maven, VS Code, JetBrains IDE