GRACE (UNNSEO) PARK

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EDUCATION

Carnegie Mellon University, School of Computer Science   Pittsburgh, PA

Master of Science in Computer Science   *May 2025*

- Relevant Coursework: Machine Learning for Healthcare (PhD), Deep Learning Systems (PhD), Designing Human Centered Software (PhD), Discrete Differential Geometry (PhD)

Bachelor of Science in Artificial Intelligence   *May 2024*

- Relevant Coursework: Natural Language Processing, Intro to Deep Learning, Algorithm Design and Analysis, Intro to Product Management, Intro to ML

WORK EXPERIENCE

Amazon   San Diego, CA

Machine Learning Engineer | Fraud Detection & Risk Prevention   *Jun 2025 – Current*

Pickup and Return Point (PARP) Abuse Prevention

- Developed and deployed **ML-based fraud detection systems** that identified **$5M/month in abusive concessions** and prevented **$2.4M/month in losses**.
- Led deep-dive analysis of sold and veteran account abuse, revealing that 98% of dormant account abuse occurs through PARP locations, enabling **$52M in fraud prevention** worldwide.
- Engineered Pre-Fulfillment Order Cancellation (PFOC) rules and **real-time detection signals** to identify suspicious ordering patterns, including dormancy analysis, payment risk assessment, and behavioral anomaly detection.
- Collaborated cross-functionally with Amazon Hub, Payment Risk ML, AIT, and SPI teams to integrate PARP-specific risk signals into fraud prevention pipelines and design **Evidence Collection programs** for **ID verification**.
- Investigated 15 online and 4 Telegram marketplaces selling aged accounts, supporting legal referrals and platform security enhancements.
- Identified abuse vectors including account farming, credential reset patterns, and non-local payment exploitation.
- Built **precision-based cancellation models** with **80%+ accuracy** while maintaining <**20% good-customer impact**.
- Audited 2,825+ orders across global marketplaces to improve detection logic and policy calibration.

Nexus Knowledge Graph Scaling and Data Ingestion

- Led the global expansion of a high-throughput knowledge graph pipeline from US-only operations to Europe, Asia and far east extending **distributed ingestion pipeline (Kinesis, Lambda, Neptune, SNS/SQS)** to new regions.
- Drove cross-regional deployment strategy for worldwide launch to support projected **150+ TB of global data** and **192M daily events** while maintaining **702ms P99.9 propagation delay**.

Carnegie Mellon University   Pittsburgh, PA

Teaching Assistant | 11-611: Natural Language Processing   *Aug 2024 – Jan 2025*
Teaching Assistant | 15-210: Parallel & Sequential Data Structures   *Aug 2023 – May 2024*

- Led weekly recitations, hosted office hours, and managed online Q&A for **100+ students**.
- Supported assignment grading and designed supplementary materials to aid student understanding.

Red Hat   Remote

Software Engineer Intern   *May 2023 – Aug 2023*

- Integrated `share-metadata` resource support into the **OpenStackSDK Manila API**, contributing to open-source cloud infrastructure.
- Developed **unit and functional tests**, improving reliability and reducing regression bugs.

RESEARCH EXPERIENCE

Data Interaction Group, Carnegie Mellon University   Pittsburgh, PA
Research Assistant (Advisor: Prof. Adam Perer)   *Jan 2023 – Present*

- **First author** of "How Consistent are Clinicians? Evaluating the Predictability of Sepsis Disease Progression with Dynamics Models," presented at **ICLR 2024 Workshop** *Time Series for Health*.
- Designed and trained **transformer-based dynamics models** to evaluate the feasibility of reinforcement learning for sepsis treatment data.
- Developed a **simulation framework** for detecting subspaces of action diversity, achieving **83% accuracy** for one-hour prediction of diverse states.
- Authored a **Master's thesis on Reliable Policy Learning in Healthcare**, developing methods to determine when observational clinical data can reliably inform treatment policies.

PROJECTS

Kaggle Competitions | Course Project (Intro to Deep Learning)

- Developed an **MLP** to produce frame-level phonetic transcriptions from raw Mel Frequency Cepstral Coefficients.
- Built a **CNN** for face recognition that enforces position-invariance for robust classification.
- Trained **attention-based transformer models** to transduce speech recordings into word sequences.

Deep Learning Library from Scratch | Course Project (Deep Learning Systems)

- Designed and implemented a custom deep learning library with **efficient GPU operations** and **automatic differentiation**.
- Implemented core modules including **parameterized layers, optimizers, and loss functions**; used the library to build **CNNs** for image classification and segmentation.

Anyways… | Hackathon Project (TartanHacks)

- Designed an off-topic sentence detection algorithm based on keyword similarity, achieving **90% accuracy**.
- Integrated **real-time speech-to-text** with keyword analysis using the **spaCy NLP library** for a live presentation assistant.

LEADERSHIP

Carnegie Mellon University   Pittsburgh, PA
Tartan Ambassador   *May 2023 – Aug 2023*

- Conducted daily in-person campus tours for groups of up to 20 visitors, providing insights into academic life, campus culture, and CMU resources.
- Welcomed visitors and addressed questions about CMU's programs, student life, and application process.

CMU Korean Student Association   Pittsburgh, PA
Board Member   *Sept 2021 – Dec 2022*

- Planned and organized monthly events such as food sales, mentorship programs, and Korean Independence Day celebrations to promote Korean culture on campus.
- Collaborated with university organizations to increase engagement and cultural awareness among CMU students.

AI MakerSpace, Carnegie Mellon University   Pittsburgh, PA
Undergraduate Assistant   *Sept 2021 – May 2022*

- Prepared the AI MakerSpace for opening by setting up robots including Misty and Kinova robotic arms.
- Created instructional manuals and provided technical support for students using AI hardware and robotics resources.

SKILLS

Programming: Python, Java, TypeScript, C/C++, R, SML
Frameworks: PyTorch, TensorFlow, NumPy, Pandas, Matplotlib
Tools: Git, AWS, Google Cloud Platform, LaTeX