Alexander Kim

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EDUCATION

Hamilton College, Clinton, NY, Bachelor of Arts May 2025

- Majors in Mathematics and Music
- Relevant Courses: Linear Optimization, Graph Theory, Data Structures and Algorithms, Statistics Seminar

RELEVANT EXPERIENCE

Hamilton College, Clinton, NY, *Emerson Research Fellow* May 2024-Aug 2024

- Developed and tested multiple machine learning pipelines to classify vocal samples of pop music by vocal register and technique. Pipelines included preprocessing algorithms and model engineering for Support-Vector-Machines and Convolutional Neural Networks using OpenCV, Pandas, NumPy, Scikit-Learn, and Pytorch
- Built a Full-Stack desktop application to promote musician functionality with an interactive GUI using React.js
- Generated an original dataset of 7500+ vocal samples

BonePixel, Boston, MA, *Research Intern* June 2023-Aug 2023

- Designed algorithms in Python to simulate Periacetabular Osteotomy and Varus Derotation Osteotomy procedures
- Fixed 100+ incomplete 3D Mesh models with Blender and python using K-Nearest-Neighbors algorithm to find faces and vertices of non-watertight areas
- Calculated manipulations of 3D Mesh models of pelvises and femur to demonstrate procedures for hip preservation

BCH Musculoskeletal Informatics Group, Boston, MA, *Data Science Intern* June 2022-Nov 2022

- Wrote an image feature extraction program in Python as part of a quality control model
- Contributed 1200+ notes to the development of an NLP database
- Categorized and sorted CT, MRI scans by contrast level, physical features, pathologies, and quality in Excel

PROJECTS

PlayCaller.ai January 2024

- Created a Full-Stack (PostgreSQL, React.js) basketball coaching assistant that identifies offensive and defensive favorability harnessing computer vision and a Convolutional Neural Network trained on an original dataset
- Programmed player detection functionality with OpenCV and Pandas using YOLOv4 model. Modified and trained resnet18 model with Pytorch, Pandas and PIL Image to classify offensive and defensive favorability

SOFIA Voice Assistant November 2023

- Built an interactive voice assistant using OpenAI API and whisper to process speech input, and prompt ChatGPT for a text-based response

Virtual PAO and Femoral Osteotomy August 2023

- Used Python, Scipy, Networkx, Trimesh, Pymeshlab, NumPy to compute planes and manipulate 3D Mesh models to simulate Periacetabular Osteotomy and Varus Derotation Osteotomy

ZQ July 2023

- Used Python, BASH, OpenAI Whisper to build an accessible word processor that allows you to control a document using only voice commands

Hearts May 2023

- Used C++, Stacks, and Linked Lists to model a full game of hearts using 52 distinct text-based cards

PUBLICATIONS

- **"Prevalence and Predictors of Concomitant Meniscal and Ligamentous Injuries Associated with ACL Surgery: An Analysis of 20 Years of ACL Reconstruction at a Tertiary Care Children's Hospital",** American Journal of Sports Medicine, January 2024
- **"Intermediate Domain Finetuning for Weakly Supervised Domain-adaptive Clinical NER",** ACL Anthology, August 2023

SKILLS, ACTIVITIES & INTERESTS

Spoken Foreign Languages: German (Full professional proficiency)
Programming Languages: Python, C++, SQL, Java, JavaScript, Bash, R
Software Skills: Microsoft Office Suite, HTML, LaTeX, R Studio, Blender, Fusion 360, PostgreSQL
Activities and Societies: The Buffers Acapella (Music Director), AppDev@Hamilton (Eboard), Volleyball Club
Interests: Basketball, Playing Guitar, Skateboarding, Legos, Cooking southern BBQ, and Korean food