

Daeyoung Kim

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About

I am an EECS undergraduate at UC Berkeley with a prior career as a professional analog artist (watercolor, oil, acrylic, graphite). My interests lie at the intersection of computer graphics and human computer interaction, where I design and build artist centered tools and visual simulations. Recent work includes a real time digital watercolor system in Godot that models water flow, pigment diffusion, and optical glazing from an artist's perspective. Long term, I aim to pursue a Ph.D. in computer science focused on creativity support tools, interactive rendering, and interfaces that make visual creation more expressive and accessible.

Education

B.S. Electrical Engineering & Computer Sciences (EECS) University of California, Berkeley — Berkeley, CA

Aug 2023 – Expected May 2026

- GPA: 3.72 / 4.00
- Focus: computer graphics, human computer interaction, and visual computing
- Selected coursework: Data Structures & Algorithms, Discrete Mathematics, Probability, Computer Architecture, Computer Security, Computer Networks, Artificial Intelligence

Lower Division Computer Science (UC Transfer Preparation) Berkeley City College — Berkeley, CA

Jan 2021 – May 2023

- GPA: 4.00 / 4.00
- Completed all lower division CS and math requirements for UC transfer
- Selected coursework: Data Structures & Algorithms, Multivariable Calculus, Linear Algebra, Differential Equations, Introductory Programming, Physics I–II, General Chemistry
- Math & CS Tutor (18 months): supported students in programming, calculus, and linear algebra

Research Experience

Undergraduate Research Assistant — UC Berkeley, HCI & Social Computing

Nov 2025 – Present

- Contributed to a research project studying how **visual traits** cluster and spread within **TikTok aesthetic communities** (Prof. **Marti Hearst**; mentor: **Samia Menon**)
- Built exploratory modeling workflows to characterize “trait bundles” inside a single aesthetic using **Apriori** frequent itemsets, **NMF**, and topic modeling over binarized feature representations
- Developed and tested computer-vision extraction approaches: trained **YOLO** for object detection, then benchmarked against **GPT vision API** structured labeling and supported a pipeline switch based on quality/interpretability
- Performed data collection by sourcing creators aligned with a target aesthetic and generating frame/screenshot datasets for analysis
- Conducted related-work discovery and citation tracking for the project manuscript; conference submission completed (ICWSM 2026, *under review*)

Undergraduate Research Assistant — UC Berkeley, HCI & Interactive Systems

Nov 2025 – Present

- Prototyped **programmable/animated food** interactions using a modified pen-plotter platform (Prof. **Eric Paulos**; mentor: **Vivian Chan**)
- Integrated mechanical + motion components (gantry alignment, fixtures, belt ten-

sioning) and evaluated positioning accuracy/repeatability

- Implemented a **Python-to-G-code** toolchain for generating trajectories and timed animations; enabled rapid iteration across experimental conditions
- Conducted precision and material-behavior tests with magnetic food surrogates; iterated control parameters and paths to improve stability
- Communicated interaction concepts via sketches and polished figures for team discussion and potential publication

Publications

Modeling the Transmission of Visual Culture on TikTok (under review)

Submitted Jan 2026

- **Samia Menon, Daeyoung Kim**, Björn Hartmann, Marti Hearst. Submitted to *International AAAI Conference on Web and Social Media (ICWSM 2026)*.
- Contributions: visual-trait clustering experiments (Apriori, NMF, topic modeling), CV baseline (YOLO) prototyping and evaluation, creator sourcing + frame dataset collection, and related-work/citation discovery.

Projects

Digital Watercolor Painting Simulator — Godot, GLSL, GPU Physics

2025 – Present

- Built a GPU accelerated watercolor painting application in Godot Engine 4.4 that simulates realistic water flow, pigment diffusion, evaporation, and deposition in real time on a 256×256 canvas
- Implemented the physics pipeline entirely on the GPU using GLSL compute shaders and Godot's `RenderingDevice` API with double buffered textures for water, mobile pigment, and static pigment
- Developed a pressure sensitive brush system supporting tablet input with stroke interpolation, masking, and batched GPU uploads to minimize CPU-GPU transfer overhead
- Modeled optical color mixing using Beer-Lambert absorption for realistic glazing and wet in wet behavior, including pigment lifting with wet before dry priority
- Wrote a research style technical paper describing the simulation design and planned evaluation; *links*: [GitHub](#) | [project page](#) | [paper \(PDF\)](#) | [demo video](#)

Stock Market Prediction Prototype — Python, PyTorch, pandas, NumPy, SQL

2024 – Present

- Investigate short and long term stock price behavior using machine learning models informed by linear algebra concepts (SVD, PCA) studied in coursework
- Implemented LSTM based sequence models for short horizon prediction on historical time series data, producing meaningful predictive signals beyond naive baselines
- Currently developing feedforward neural network models for longer horizon behavior, with data pipelines built using pandas/NumPy and SQL for data ingestion and preprocessing
- Use the project as a sandbox for model evaluation, hyperparameter tuning, and comparative analysis of time series representations

Get Fit or Quit — CalHacks Game Project — Python, Pygame

2022

- Co-developed an arcade style game where the player catches healthy foods and avoids junk food to maintain a fitness level over 60 seconds
- Implemented core gameplay loop, collision handling, and difficulty ramp with multiple phases as object spawn rates increase over time
- Designed dynamic feedback: character size changes with fitness level to provide immediate visual indication of player state
- Packaged the game with a simple installation flow (`requirements.txt`, `main.py`)

for easy distribution; repository: github.com/Dubu911/Get_fit_or_quit 

Experience

Computer Science Tutor — Berkeley City College, Berkeley, CA	Sep 2025 – Present
• Tutor students across all computer science courses through the Learning Resources Center • Give short, targeted mini lectures on core CS concepts (data structures & algorithms, x86 assembly, computer organization) • Guide students on assignments by focusing on problem decomposition, debugging strategies, and conceptual understanding	
Math Tutor — Laney College Math Lab, Oakland, CA	Aug 2022 – May 2023
• Provide in person and online tutoring for students across the Peralta district, from Algebra through Calculus III • Support 3–4 tutors in a shared lab environment, helping students with both conceptual understanding and homework • Adapt explanations to diverse backgrounds and levels of preparation	
Embedded Computer Science Tutor — Berkeley City College, Berkeley, CA	Aug 2022 – May 2023
• Embedded tutor for an introductory computer science course with Prof. Benjamin Allen • Help students develop algorithmic thinking rather than giving direct solutions, guide them through debugging and problem decomposition • Provide both in class and outside of class support for students struggling with core CS concepts	
Sub Engineer, Semiconductor Equipment — Samsung Plant, Xi'an, China	Feb 2017 – Feb 2019
• Worked on installation and removal of semiconductor manufacturing equipment in a clean room environment • Collaborated with a team of ~10 engineers and 30 local staff, supported technical communication as my Chinese improved • Gained exposure to fabrication processes and high reliability industrial workflows	
Sales Manager — Infeed Corp (Coperion K-Tron Sole Agent), Korea	Jan 2016 – Jan 2017
• Managed client relationships for high precision industrial feeders in chemical, plastics, and food industries • Recommended appropriate feeder configurations based on process requirements and constraints • Handled invoicing, troubleshooting, and coordination with technical teams	
Logistics Staff — DB Schenker, Korea	Jan 2015 – Dec 2015
• Tracked inbound and outbound semiconductor equipment parts in a specialized warehouse • Used SAP and Excel to maintain inventory accuracy and shipment records • Developed attention to detail working with sensitive, high value components	
Engineer (Alternative Military Service) — Dyne Electricity, Korea	Jan 2012 – Oct 2014
• Repaired industrial water pumps for customers, combining electrical and mechanical diagnostics • Communicated directly with clients about issues, repair status, and preventive maintenance • Completed 34 months of government approved industrial service in lieu of military duty	
Main Art Instructor — Mokwoo Art Institution, Korea	Mar 2009 – Dec 2010
• Led a class of ~50 high school students preparing for competitive entrance exams	

to art universities

- Designed and ran 5 hour studio “demo tests” simulating real exam conditions, provided detailed feedback on drawing and composition
- Balanced technical instruction with emotional support, building student confidence and improving outcomes

Skills

Programming: Python, C/C++, Java, GDScript, GLSL (compute shaders), Bash

Architecture & Assembly: x86, RISC-V

Libraries & Tools: PyTorch, pandas, NumPy, SQL, Godot Engine 4, Pygame, Git, Linux

Graphics & Simulation: GPU programming (Godot `RenderingDevice`, compute shaders), real-time physics simulation, optical color mixing (Beer–Lambert), interactive tool design

Machine Learning & Data: Time series modeling (LSTM, feedforward networks), data preprocessing and analysis, dimensionality reduction (PCA, SVD concepts)

Mathematics: Linear algebra, multivariable calculus, differential equations, probability & statistics

Art & Design: Traditional watercolor, oil, acrylic, graphite; art instruction; visual composition and critique