Daeyoung Kim

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○ Dubu911

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, HCI & Interactive Systems — UC Berkeley

Nov 2025 – Present

- Working with a graduate mentor (and Prof. Eric Paulos) on an early-stage project designing interactive systems where physical food elements can move, reconfigure, or respond to user actions
- Reviewing literature in human–computer interaction, tangible/embodied interaction, and human–food interaction (e.g., *Dancing Delicacies*, DIS '23) to map relevant design spaces
- Brainstorming and documenting concepts for interactive "computational food" experiences using sketches, storyboards, and scenario-based design
- Preparing to contribute to research-through-design prototyping, drawing on prior work in real-time graphics, simulation, and artist-centered tool design

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