

# Daeyoung Kim

📍 Berkeley, CA 📩 daeyoungkim@berkeley.edu ☎ +1 510-282-4173 ⚡ dubu911.github.io 💬 daeyoungdubu  
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## About

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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

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**B.S. Electrical Engineering & Computer Sciences (EECS)** Aug 2023 – Expected May 2026  
**University of California, Berkeley** — Berkeley, CA

- 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)** Jan 2021 – May 2023  
**Berkeley City College** — Berkeley, CA

- 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

## Projects

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**Digital Watercolor Paintin 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  $256 \times 256$  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](https://github.com/Dubu911/Get_fit_or_quit)

## Experience

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**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

<ul style="list-style-type: none"> <li>Handled invoicing, troubleshooting, and coordination with technical teams</li> </ul>	
<b>Logistics Staff</b> — DB Schenker, Korea	Jan 2015 – Dec 2015
<ul style="list-style-type: none"> <li>Tracked inbound and outbound semiconductor equipment parts in a specialized warehouse</li> <li>Used SAP and Excel to maintain inventory accuracy and shipment records</li> <li>Developed attention to detail working with sensitive, high value components</li> </ul>	
<b>Engineer (Alternative Military Service)</b> — Dyne Electricity, Korea	Jan 2012 – Oct 2014
<ul style="list-style-type: none"> <li>Repaired industrial water pumps for customers, combining electrical and mechanical diagnostics</li> <li>Communicated directly with clients about issues, repair status, and preventive maintenance</li> <li>Completed 34 months of government approved industrial service in lieu of military duty</li> </ul>	
<b>Main Art Instructor</b> — Mokwoo Art Institution, Korea	Mar 2009 – Dec 2010
<ul style="list-style-type: none"> <li>Led a class of ~50 high school students preparing for competitive entrance exams to art universities</li> <li>Designed and ran 5 hour studio “demo tests” simulating real exam conditions, provided detailed feedback on drawing and composition</li> <li>Balanced technical instruction with emotional support, building student confidence and improving outcomes</li> </ul>	

## Skills

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

**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