Abhay Gupta

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Current: Seattle, WA 98104
Portfolio: **abgup.com**
U.S. Citizen

I am an experienced engineer currently seeking new opportunities after a career break to focus on volunteering and teaching. I am passionate about giving back to the community, inspired by the belief that collective action builds a stronger future, as highlighted in *Bowling Alone*. I aim to bring this commitment to societal impact into my next professional role, combining my technical expertise with a purpose-driven approach.

PUBLICATIONS, CONFERENCES & PATENTS

Automobile Damage Detection Using Thermal Conductivity — Dec 2018
J. Schow, and A. Gupta (US Patent)

A Cellular Automaton for Modeling Non-Trivial Biomembrane Ruptures — July 2018
A Gupta, G. Reint, I. Gozen, and M. Taylor
Presented at *The 13th World Congress in Computational Mechanics (WCCM)* — Sep 2018
Session: Novel Mathematical Models and Computational Methods, New York, NY
Published in *Soft Matter*

SKILLS

Languages
- Python
- C# & Lua
- Javascript & VBA
- HTML/CSS
- Bash & Powershell
- Vimscript
- C/C++
- LabView

Frameworks
- WinForms/WPF
- Flask
- Jekyll
- Cordova
- JQuery
- Next.js
- LaTeX & Maple
- Matlab/Simulink

Software Tools
- Git
- Cmake
- Jira/Azure
- Docker
- Figma
- Microsoft Office
- Linux
- Android/iOS

Modeling/Analysis
- SolidWorks
- Siemens NX
- OnShape/AutoCAD
- Ansys CFX
- Star CCM+
- Abaqus
- FreeCAD
- Fusion 360

Hardware Tools
- 3D Printers
- Lathe/Mill
- Drill Press
- Bandsaws
- Sanders/Grinders
- Oscilloscopes
- Soldering
- Function Generators

EDUCATION

University of Washington
M.S. Robotics & Data Science — 2018 - 2019
- Thesis - 3D Graphics & Regression Models || 3.6
- Advisors: Steve Brunton & Ashis Banerjee
- Taught graduate mathematics courses for engineering
- Researched & developed a custom physics simulation of Optical Tweezers and digital twin models for compliant motors via machine learning regression methods

Python || MATLAB || C++ — OpenGL || ROS

Santa Clara University
M.S. Computer Engineering — 2017 - 2018
- Half Completed || Transferred to University of Washington || 3.8
- Simulated biological membrane fracture through AI methods (*see paper*)

B.S. Mechanical Engineering — 2014 - 2017
- Entrepreneurship minor || Graduated in 3 years with honors || 3.6
- Assisted teaching course in Numerical Analysis to undergraduate engineering students

MATLAB || LaTeX|| C || Simulink || LabVIEW || Maple — SolidWorks || Abaqus || Star-CCM+
Lathe || Mill — Oscilloscopes

INDUSTRY EXPERIENCE

Kawasaki Robotics — 2022
SW Engineer, Robotics
- Developed software to move wafer handling (scara) robots
- Tested physical robotics arms on local and vendor facilities to ensure functionality
- Optimized for throughput and reach requirements to maximize computer chip production capability

AS - Domain Specific Language

SummerBio — 2021 - 2022
SW Engineer, Robotics
- Developed software drivers (6 DOF arms, benchtop systems) for VWorks
- Built communication platforms through both Ethernet and serial port protocols
- Built hardware testing rigs to ensure new hardware/drivers work with automation line
- Unit tested drivers through manual isolation testing and automated via C# test framework, xUnit

C# || Figma — OnShape

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INDUSTRY EXPERIENCE (continued...)

Lam Research — 2020 - 2021
SW/ME Engineer

- Led and assisted Android app development via Cordova (JS) framework
- Developed/Maintained software to optimize a 6 DOF robotic arm via C# WinForms
- Built communication protocols for hardware components via Modbus, Ethernet, and Bluetooth protocols
- Physically tested software and hardware in clean room environment via systematic approach
- Analyzed test results via data science techniques to ensure repeatability and reliability metrics
- Led development of and maintained a fishbone diagram issue diagnosis application with offshore developers via C# Xiamarin Framework on Windows and Android
- Automated Android content upload and verification via VBA excel automation tools
- Worked alongside machinists to develop custom test rigs and hardware components (sheet metal, aluminum/steel parts, injection molded designs, etc) for robotics arm applications
- Designed and printed custom 3D components on a MakerBot and local venders
- Designed a custom electronics cart via Siemens NX fitting custom components and facility constraints

C# || JavaScript || Python || VBA || Figma NX || Teamcenter

CSAA Insurance — 2018 - 2020
Physics Consultant

- Evaluated novel engineering and physics aspects for patent applications
- Researched alternative approaches for products and methods

INTERNSHIPS

Microvision — Summer 2019
SDE Intern

- Modeled the response of Lidar activated SiPM (Silicon photomultipliers)

Simulink || MATLAB LTSpice

TheraNova — Summer 2018
SDE Intern

- Developed a python software analysis system to understand gait measurements
- Ensured accuracy of the software analysis for 80+ patients

Python || MATLAB

Valeo — Spring 2018
Systems Engr Intern

- Produced hardware and software demos for automotive OEMs
- Collaborated with start-ups and OEMs to develop new cabin safety features

VBA

Pentair — Summer/Winter 2017
ME/EE Intern

- Optimized performance of steady state and transient phases of circuit breakers
- Laboratory tested and simulated rail heating to melt snow

Ansys CFX || Solidworks Oscilloscopes, Function Generators, DC/AC Power Supplies, Soldering

Accel Biotech — Summer 2016
ME Intern

- Prototyped medical device components and test assemblies
- Supported mechanical, electrical, and software design of a blood diagnostic device

SolidWorks Oscilloscopes

Caltrans — Summer 2015
ME Intern

- Reviewed and advised on structural testing for next generation locomotives
- Designed a floor plan using Microsoft Visio & participated in vendor meetings

CERTIFICATIONS

State of CA — May 2018
Engineer-In-Training

- Professional engineering association certification for CA state

github.com/ab12gu/freewheels

Dassault Systemes — Mar 2015
SolidWorks CSWA

- 3D design certification

github.com/ab12gu/freewheels

SOFTWARE PROJECTS

206 Bike Polo — 2024 - Present
Web Developer

- Update and maintain website using Javascript framework (Next.js)

HTML || CSS || Javascript Next.js 206bikepolo.com

San Jose Bicycle Coalition — 2024 - Present
Software/Data Consultant

- Use OCR package to automate uploading of sign in sheets into Salesforce

Python Salesforce bikesiliconvalley.org

Find a Paint — 2021 - 2022
Web Developer

- Developed website to compare paint brands of paints to help a high school parent

Python || HTML/CSS || JS Flask findapaint.com

Masala Blend — 2020 - 2021
Web Developer

- Help stepmother build webpage to sell homemade spices locally

HTML || CSS || Javascript Shopify || Jekyll masalablend.com

Personal Website & Resume — 2017 - Present
Web Developer

- Build personal website via github pages & programmatically render resume

HTML || CSS || JS || Latex Jekyll || Xetex abgup.com

Peer Porfolio Consulting — 2020 - Present
Web Developer

- Assist undergraduates build their resume & web porfolio

HTML || CSS || JS || Python Latex || Django github.com/carly85/personal-resume

Bike Components Database — 2024 - Present
Web Developer

- Build webpage & database of bicycle components

Markdown github.com/ab12gu/freewheels

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HARDWARE PROJECTS

Cap Hill Tool Library
3D Printing Lead

- Assist community members and create models/prints for in-house repairs and personal projects

OnShape

Bike Polo
Mallet Design/Fabrication

- Model, 3D print, and fabricate custom bike polo mallet
- Iterate through design process, optimizing for weight and reduction of stress concentration/shattering

Onshape Drill, Drill Press, Bandsaw

Custom LEDs
Smart LED Lighting

- Build custom LED timed lighting to match the circadian rhythm of the sun
- Change lighting within building from blue light to gradually hit red light throughout day

C/C++ Rasberry Pi

Vehicle Builds and Repair
Repair Tech

- Build custom bicycles in community to encourage human powered tranportation
- Repair small and large vehicles in community (Electric Unicycles, Motored vehicles, etc)

Torque wrenches, hydraulic lifts, etc Soldering iron, oscilliscopes, etc

Bike Component Automation
Automation Lead

- Design and build wireless shifting and cam shafts on bicycles with peers

FreeCAD || C/C++ Arduino Uno github.com/ab12gu/bicycle-projects

Hardware Hacking
Hacker

- Reverse engineer various electronic devices, such as modems
- Reprogram electronic devices to optimize performance via bios

Bash/Powershell CPUs/Microcontrollers github.com/ab12gu/hacking

VOLUNTEERING ACTIVITIES

Auto Angels, Bellevue Car Mechanic — Jun 2024 - Present

Rainier Scholars, Seattle Computer Science Curriculum TA/Development Assistant Python — Jun 2024 - Present

The Bikery, Seattle, Bicycle Board Member & Technician — Nov 2023 - Present

Capitol Hill Tool Library, Seattle Shop Manager Onshape, Machine Shop Tools (metal/wood/acrylic) — May 2024 - Present

San Jose Bicycle Coalition (SJBC), Software & Data Consultant — Jul 2020 - Present

Santa Clara University, Alumni Engineering Mentor HTML, CSS, Javascript, Python — Oct 2023 - Present

San Jose Bicycle Clinic, Bicycle Technician — Jul 2020 - Present

FIRST Robotics Competition (FRC) 254, 5940, 1983, & 4180, Engineering Mentor JAVA, Onshape, SolidWorks — Aug 2021 - Present

Reddit Group: r/ControlTheory, Moderator — Dec 2018 - Present

HOBBIES

Sports

- Juggling
- Handstands
- Bicycling
- Unicycling
- Bike Polo
- Basketball

Sports

- Walking
- Tennis
- Calisthenics
- Running
- Skateboarding
- Rollerskating

Indoor

- Board Games
- Rubix Cube Solving
- Dancing
- Music & Movies
- Drawing
- Painting

Indoor

- Weight Lifting
- Reading
- Video Games
- Cooking
- Yoga
- Socializing

Miscellaneous

- Coding
- Blogging
- Content Creation
- Comedy
- Reddit
- Tinkering

For more: **abgup.com**