Iraj Shrotri - Process Engineer

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Objective:
Driven student leveraging studies in electrical engineering seeks real world experience as an Research Engineer. Offers strong interpersonal, leadership, and task prioritization skills.

Work Experience:

Process Engineer - Intel Fab 11X Lithography Stepper Engineer Oct 2023 - Present

- Maintained and optimized on Veeco AP-300 Lithography
- Utilized advanced optical systems to detect defects in high volume production
- Responsible for New Product Transfer from OR to NM Site for Canon and Veeco toolsets

Undergraduate Research Assistant - University of California at Riverside Sept 2022 - July 2023

- Conducted experiments and analyzed materials in the Zachariah Group Material Science Lab.
- Collaborated with a team of researchers to advance material science knowledge.
- Link to Website: https://mrzgroup.ucr.edu/

Private Tutor - Grade Potential Tutoring Jan 2023 - June 2023

- Worked as a math tutor helping high school students with college and SAT preparation.
- Provided personalized tutoring sessions, resulting in improved GPAs by an average of 1.
- Link to Website: https://www.gradepotentialtutoring.com/inland-empire-ca-tutoring

Education:

UC Riverside, Riverside, CA - B.S. Electrical Engineering Sept 2018 - June 2023
Specialization in Control, Robotics & Machine Intelligence

De Anza College, Cupertino, Ca. - Supplementary Classes Summer 2019

Lab Skills:

Programing Languages:	C, C++, C#, Java, Python,Verilog, Colab, HTML
Software:	LTSpice, Matlab
Technical:	Soldering, Assembly, Logic Design

Projects:

Earth Rover - Senior Design Project

- Developed a versatile radio-controlled car for real-time soil sampling and data collection.
- Implemented manual and autonomous navigation & object detection using a 2D LiDAR and 2MP camera.
- Link to Presentation: http://bit.ly/earth-rover-presentation

Updating Counter Flow Lab Setup

- Updated an existing material burn rate measurement rig with modern components.
- Utilized a high-quality ThorLabs micro stepper and controller powered by C# program, along with a photoresistor and laser setup controlled by Arduino.
- Link to Presentation: https://bit.ly/counter-flow-setup

Machine Learning Test Data Imaging Construction

- Generated training data for a machine learning program to identify particles in molten boron.
- Created binarized images to maximize precision of the machine learning model.
- Link to Demo: https://bit.ly/image-construction-demo

Awards:

Inova'R Award - ICorps: December 2020 - March 2021

- Designed a custom Jukebox compatible with various vinyl sizes.
- Presented weekly with progressive improvements and customer research.
- Awarded $3,000 grant for prototyping.

Volunteer Experience:

Junior Assistant Scoutmaster - Boy Scouts April 2010- April 2018

- Organized and executed a Service Project at a local church to earn Eagle Scout Rank.
- Taken courses on accountability, leadership and responsibility.
- Over 100+ hours of community service.

Assistant Wrestling Coach - Miller Middle School Fall 2016- August 2018

- Worked with youth ages 7-12, and prepared students for competition.
- Practicing wrestling and safety with students.
- Answered questions from students and parents

Relevant Coursework:

Calculus Series - MATH 9A, 9B, 9C, 10A, 10B

Introduction to the differential calculus of functions of one variable and to the integral calculus of functions of one variable. Further topics from integral calculus, improper integrals, infinite series, Taylor's series, and Taylor's theorem. Topics include Euclidean geometry, matrices and linear functions, determinants, partial derivatives, directional derivatives, Jacobians, gradients, chain rule, and Taylor's theorem for several variables. Covers vectors; differential calculus, including implicit differentiation and extreme values; multiple integration; line integrals; vector field theory; and theorems of Gauss, Green, and Stokes.

Physics Series - PHYS 40A, 40B, 40C

Covers topics in classical mechanics including Newton's laws of motion; friction; circular motion; work, energy, and conservation of energy; dynamics of particle systems; collisions; rigid-body motion; torque; and angular momentum. Covers topics in mechanics and thermodynamics including elasticity; oscillations; gravitation; fluids; mechanical waves and sound; temperature, heat, and the laws of thermodynamics; and the kinetic theory of gasses. Covers topics in electricity and magnetism including electric fields and potential; Gauss' law; capacitance; magnetic fields; Ampere's law; Faraday's law and induction; electromagnetic oscillations; dc and ac current; and circuits.

High Level Programing Languages - CS 10, CS 13, CS022B

Covers structured and object-oriented programming in C++; pointers; sorting algorithms;Emphasizes good programming principles and development of substantial programs. Topics include recursion, pointers, linked lists, abstract data types, and libraries. Covers software engineering principles. Utilizes examples and assignments specific to engineering disciplines such as numerical data analysis, matrix computations, and dynamic systems.
Software Used: C++

Machine Language and CPU Construction - CS 61

An introduction to computer organization; bit manipulation, hexadecimal; binary storage and math, number representation, combinational and sequential logic, computer instructions, memory organization, addressing modes, interrupt, input/output (I/O), assembly language programming, assemblers, and linkers.
Software Used: Assembly Language

Linear Algebra - EE 20, MATH 46
Introduces MATLAB programming and linear methods for engineering analysis and design. Topics include formulating engineering problems as linear systems of equations; methods for finding their solutions; vector and matrix representations of signals and systems; matrix computations; and linear programming for system analysis and design. Introduction to first-order equations, linear second-order equations, and Laplace transforms, with applications to the physical and biological sciences.
Software Used: Matlab

Electrical Series - EE 1A, 1B
Ohm's law and Kirchoff's laws; nodal and loop analysis; analysis of linear circuits; network theorems; transients in RLC circuits. Laplace and Fourier analysis.
Software Used: LTSpice

Advanced Electrical Series - EE 100A, 100B
BJT and MOSFET circuit design and application Topics include small-signal modeling of electronic circuits; DC biasing of small-signal bipolar and field-effect transistor amplifiers; current mirrors, cascodes, differential amplifiers, and multistage amplifiers
Software Used: LTSpice

Signals And Systems Series - EE 110A, 110B, 141
Covers basic signals and types of systems, linear time-invariant (LTI) systems, Fourier analysis, frequency response, and Laplace transforms for LTI systems. Includes laboratory experiments with signals, transforms, harmonic generation, linear digital filtering, and sampling/aliasing. Fourier analysis for discrete-time signals and systems.
Software Used: Matlab

Electromagnets - EE 116, 117
Transmission lines, fields and field operators, electrostatic and magnetostatic fields, time-varying fields, electrodynamics, electromagnetic waves, plane waves, guided waves, and applications to engineering problems. Covers applications of Maxwell's equations. Includes skin effect, boundary-value problems, plane waves in lossy media, transverse EM waves, hollow metal waveguides, cavity resonators, microstrips, propagation in dielectrics and optical fibers, optical fibers applications, radiation, and antennas. Covers theoretical and computer modeling exercises in basic electromagnetic technology.

IC Chips for Prototyping - EE 120A, CS 120B
Covers design of digital systems. Includes Boolean algebra; combinational and sequential logic design; design and use of arithmetic logic units, and significant hardware prototyping.
Software Used: C, Verilog, Oracle VMBox

Modeling Systems - EE 105
Introduces the mathematical modeling of dynamical systems and their methods of solution. Explores advanced techniques and concepts for analytical modeling and study of various electrical, electronic, and electromechanical

systems based upon physical laws. Emphasizes formulation of problems via differential equations. Addresses numerical methods for integration and matrix analysis problems.
Software Used: Matlab

Power Systems - EE 123
Covers the study of power semiconductor devices. Includes magnetic circuits and components; switch mode converters and power supplies; and single, three-phase, pulse width modulation, and resonant pulse inverters. Addresses voltage controllers; direct current and induction motor drives; and design of motion control drive circuits for robotic and industrial automation systems
Software Used: LTSpice

Automatic Control - EE 132
Covers mathematical modeling of linear systems for time and frequency domain analysis. Topics include transfer function and state variable representations for analyzing stability, controllability, and observability; and closed-loop control design techniques by Bode, Nyquist, and root-locus methods. Laboratories involve both simulation and hardware exercises.
Software Used: Matlab

Foundation of Robotics - EE 144
Provides foundational knowledge on analysis, control, and programming of robots. Consider configuration space, rigid body motion, forward, inverse and velocity kinematics, dynamics, trajectory planning, robot motion control, localization and mapping, and robot ethics. Integrates hands-on labs to program robots in simulation and experimentally by reading and interpreting sensor data.
Software Used: VMWare, Python, Gazebo, ROS

Sensing and Actuation for Embedded Systems - EE 128
Covers embedded system design for sensor data acquisition, signal processing, control, and actuation. Explores sensor and motor interface principles (analog-to-digital and digital-to-analog conversion, Nyquist sampling rate, power constraints, and communication with peripherals). Also addresses design principles for instrumentation, embedded software programming, and real-time systems for sensing and control tasks.
Software Used: C, C++, Kinesis

Intro to Machine Learning & Data Mining - CS 171
Introduces formalisms and methods in data mining and machine learning. Topics include data representation, supervised learning, and classification. Covers regression and clustering. Also covers rule learning, function approximation, and margin-based methods.
Software Used: Python, Google Colabratory

Interests and Hobbies:

Beyond my academic foundation in electrical engineering, I am deeply driven by a passion for technology and hands-on innovation. My interests span a range of technical and creative projects that demonstrate both my problem-solving skills and dedication to continuous learning.

In video game modding, I have refined my programming expertise while developing a nuanced understanding of game mechanics and design principles. My enthusiasm for hardware projects includes repairing complex systems like the disk drive of my PlayStation 4 and custom-building PCs tailored to the specific needs of myself and others. I have also explored the dynamic capabilities of Linux, installing and configuring it across various devices, and set up home servers to provide secure, efficient data access and sharing for my family.

Additionally, I have designed and actively maintain a professional portfolio website to showcase my projects and achievements, underscoring my commitment to innovation, effective communication, and professionalism. These endeavors highlight my passion for technology and my drive to apply creative solutions to real-world challenges.

Thank you for considering my application. I am eager to bring my diverse technical expertise and enthusiasm to your esteemed organization.