Portfolio of Selected Engineering Projects

Javad Isazadeh Langroudi

Mechanical Design Engineer | Product Developer | CAD/CAM Specialist

Mechanical Design

CAD/CAM Systems

Automation Systems

Innovation

About Me

13+ Years Experience

Specializing in transforming complex ideas into functional, manufacturable solutions through precision engineering and innovative design approaches.

Project Domains

- Medical Devices
- Industrial Automation
- IoT Security Systems
- Sustainable Technologies

Technical Expertise & Specialties

CAD/CAM Systems

CATIA, SolidWorks, PowerMILL mastery for complex design challenges

CNC Machining

Advanced manufacturing techniques with precision tooling

FEA Simulation

Structural analysis and optimization using advanced modeling

CFD Analysis

Flow optimization and thermal performance modeling

Prototype Dev

Rapid iteration from concept to functional prototypes

Team Leadership

Cross-disciplinary collaboration and project management

"Specialized in transforming complex ideas into functional, manufacturable solutions through precision engineering and innovative design approaches."

Project 1: Air Purifier UV Plus

Role

Lead Designer & Developer

Overview

Compact, high-efficiency air purification system integrating UV-C sterilization and multi-layer filtration. Designed for residential and clinical environments.

Technical Highlights

Developed ergonomic casing using CATIA and SolidWorks
3D modeling for optimal user interaction and aesthetic appeal

Integrated UV-C module with safety shielding
Effective sterilization while preventing harmful UV exposure

Optimized airflow using CFD simulation
Computational fluid dynamics for maximum air circulation efficiency

Achieved 99.7% particle filtration in lab tests
Exceeding industry standards for air purification performance

99.7%	**UV-C**	**32dB**
Filtration Rate	Sterilization	Noise Level

Project 2: Arm Porter Robot

⚙ Role

Mechanical Designer & Control Integrator

ℹ Overview

A robotic arm system for automated object handling in industrial settings, featuring modular joints and programmable motion paths.

★ Technical Highlights

Designed 6-DOF arm with aluminum and polymer components
Optimized for strength-to-weight ratio and mechanical durability

Integrated stepper motors and Arduino-based control
Precise motion control with open-source hardware integration

Developed GUI for motion programming
Intuitive interface for defining complex movement sequences

Conducted stress analysis using ANSYS
Finite element analysis to optimize load-bearing capacity

6-DOF	±1mm	Arduino
Movement Axes	Precision	Control System

Project 3: Biometric Door Lock

👤⚙ Role

Product Developer & System Integrator

ℹ Overview

A smart security system combining fingerprint recognition, keypad access, and remote control via mobile app. Enhanced security with multi-factor authentication for residential and commercial applications.

⭐ Technical Highlights

⚙ **Reverse-engineered commercial locks for modular design**
Created adaptable solution compatible with various door configurations

👆 **Integrated biometric sensor with microcontroller**
Seamless integration of fingerprint recognition technology with control systems

🚫 **Designed waterproof casing and internal PCB layout**
Weather-resistant enclosure protecting sensitive electronic components

</> **Developed firmware for multi-user access**
Customizable user permissions with administrative control features

IP54	3-in-1	100+
Protection Rating	Access Methods	User Capacity

Project 4: Veinscope

Role

Industrial Designer & Prototyping Lead

Overview

A medical device for visualizing veins using near-infrared light, improving injection accuracy in clinical settings. The technology enhances patient comfort and reduces failed injection attempts.

Technical Highlights

Designed ergonomic handheld casing for clinicians
Optimized for extended use during medical procedures
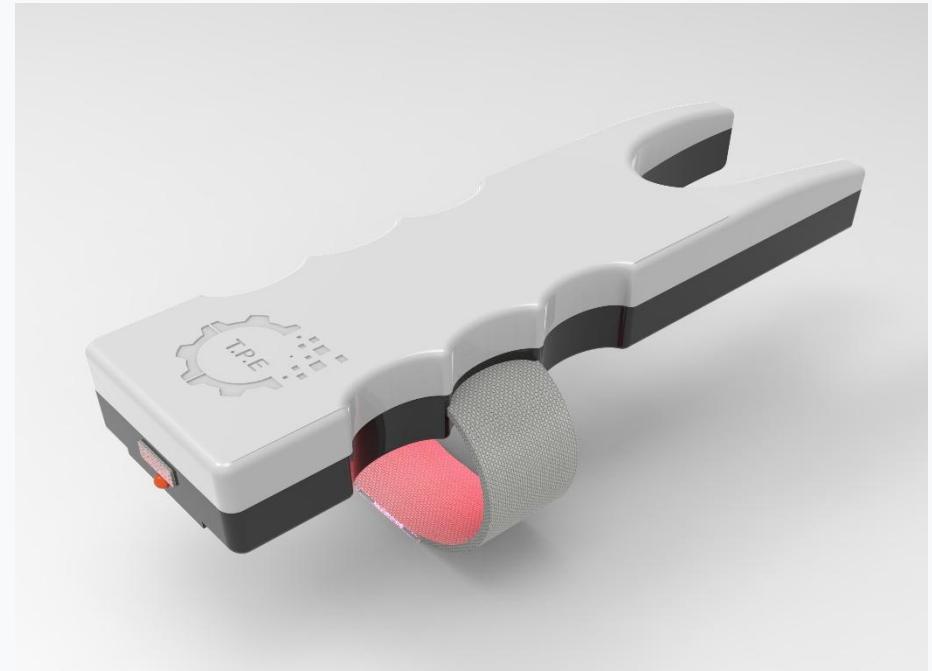
Integrated NIR LEDs and CMOS sensor
Specialized components for subsurface vein detection

Developed adjustable light intensity system
Adapts to different skin tones and tissue densities

Created 3D-printed prototype for testing
Rapid iteration for form factor refinement

NIR
Technology

85%
First-stick Success

2.5cm
Tissue Penetration

Project 5: Automated Forage Mixer

⚙️ Role

Mechanical Engineer & Process Optimizer

ℹ️ Overview

Agricultural machine for automated mixing and dispensing of livestock feed, improving efficiency and consistency. Designed for large-scale farms with high volume feeding requirements.

⭐ Technical Highlights

⚙️ **Designed gear-driven mixing mechanism**
Robust power transmission system for handling high-density feed materials

⚖️ **Integrated load cell sensors for weight control**
Precise measurement system ensuring accurate feed composition
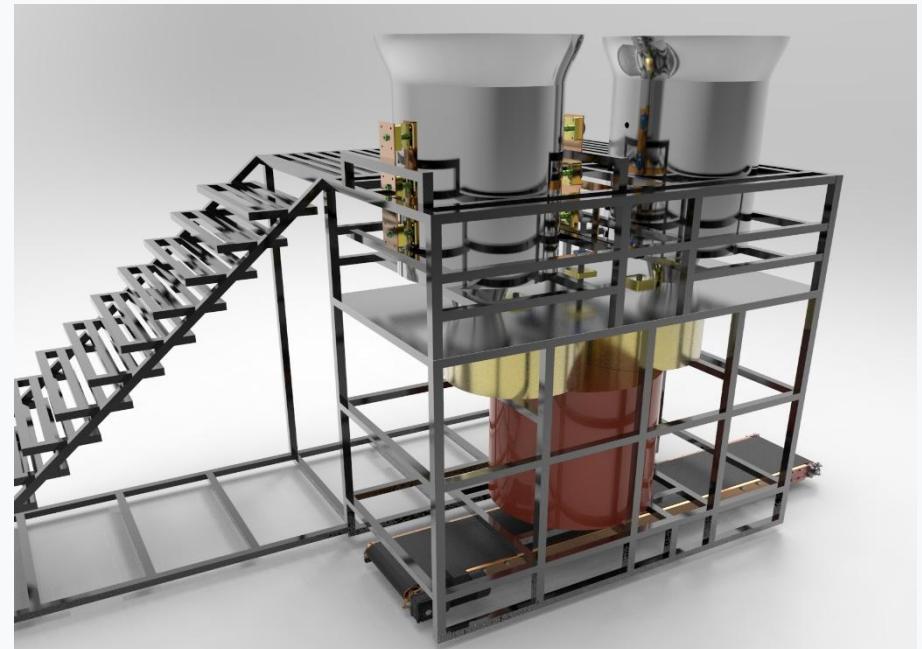
🖥️ **Developed control panel with programmable cycles**
User-friendly interface allowing customizable mixing sequences

🧮 **Optimized blade geometry for uniform mixing**
Computational analysis for optimal material distribution

60%	**±0.5kg**	**12**
Labor Reduction	Weight Precision	Preset Programs

Let's Build Something Remarkable Together

Every project reflects my commitment to innovation, precision, and user-centered design. I thrive in multidisciplinary environments where engineering meets creativity, and I'm eager to contribute to global teams that value technical excellence and meaningful impact.

Innovation
Transforming ideas into solutions
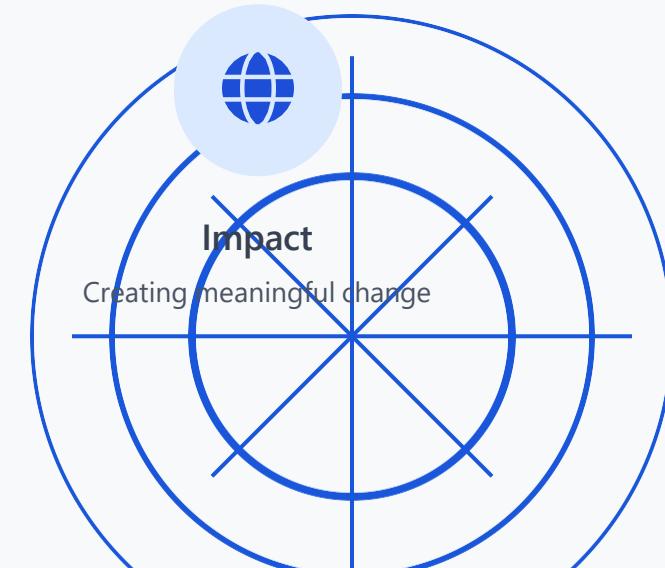
Precision
Attention to engineering detail

Collaboration
Success through teamwork

Impact
Creating meaningful change

✉ Let's Connect