Abdelrahman Amin M. Yousef

Mechanical Design & Manufacturing Engineer | Production-Line Systems | Robotics
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LinkedIn | Portfolio | Fab Academy

PROFILE

Mechanical Engineer with comprehensive expertise in the design, manufacturing, and monitoring of production processes. Strong background in mechanical design and digital fabrication, with hands-on proficiency in CNC machining, sheet-metal fabrication, additive manufacturing, and conventional machining (lathe and milling). Leveraging ongoing graduate studies, as well as leadership in robotics competitions, to integrate advanced robotics and AI into traditional engineering workflows.

EDUCATION

Master of Science in Robotics & AI — University of Jordan Amman, Jordan | Feb 2026 – Present
School of Engineering — graduate study in robotics, control, and artificial intelligence.

Higher Diploma in Digital Fabrication — MIT–Fab Foundation Amman, Jordan | Jan 2022 – Jun 2022
Final project: Design of a Parametric Prosthetic Hand.

B.Sc. in Mechanical Engineering — University of Jordan Amman, Jordan | Sep 2016 – Sep 2021
School of Engineering | Cumulative GPA: 3.21 / 4.00 | Final project: Self-Configuring Modular Robot.

PROFESSIONAL EXPERIENCE

Hackerspace Engineer — Al Hussein Technical University (HTU) Amman, Jordan | Nov 2023 – Present

- Provide technical support to students on capstone and course projects within the university hackerspace, and supply engineering expertise to research projects.
- Supervise and mentor student teams through capstone projects and robotics competition entries.
- Teaching assistant for Advanced Manufacturing, STEM, ETS, and Advanced Workshop labs.
- Organize and run robotics competitions for students.
- Deliver training workshops on digital fabrication, including 3D printing (FDM, SLA, SLS), CNC routing, and CNC milling.

Mechanical Design Engineer — Afaq Amman, Jordan | Nov 2022 – Nov 2023

- Designed and developed production machines and full production lines for the food and pharmaceutical industries, according to Design for Manufacturing (DFM) principles, using CNC machining, turning, electrical discharge machining (EDM), sheet-metal fabrication, argon welding, grinding, polishing, and laser, plasma, and water-jet cutting.
- Selected manufacturing processes and materials in compliance with GMP and FDA standards, alongside cost, production volume, and quality requirements, driving cost optimization.
- Monitored manufacturing and assembly processes on the shop floor, verifying that each stage met design specifications and quality requirements.
- Produced full CAD models in Autodesk Inventor and exported two sets of technical drawings: assembly-instruction drawings to guide manufacturing and assembly, and documentation drawings provided to the documentation department for preparing user manuals and related files.

Mechanical Design Freelancer Amman, Jordan | Sep 2021 – Present

- Design and fabricate customized products tailored to specific client needs.
- Design and customize small-scale CNC machines for home workshops, optimizing bed dimensions and space efficiency to client requirements.
- Prototype and test a wide range of designs to ensure functionality, usability, and manufacturability.

Digital Fabrication Intern — Fab Lab TechWorks Amman, Jordan | Jul 2021 – Jul 2022

- CAD design and product development applying core engineering principles, taking digital designs through to physical prototypes.
- Rapid prototyping with additive (FDM, SLA, LDM, SLS) and subtractive (CNC machining, laser cutting) manufacturing.
- Performed molding and casting with silicone molds for replicating identical parts; designed and fabricated PCBs using ATtiny and ATmega microcontrollers.
- Supported clients in manufacturing their required PCBs, from design through to fabrication.

INDUSTRIAL & PRODUCTION-LINE ENGINEERING

Hummus Production Line (1.5 tons/hour) — Afaq Amman, Jordan

- Part of the design team for a complete hummus production line covering soaking, cooking, blending, mixing, buffering, and transfer between stages.
- Designed and monitored the manufacturing process to ensure efficiency and quality at each stage, delivering product to the pasteurization line.

Pharmaceutical-Grade Vacuum Liquid Mixer (2000 L) — Afaq Amman, Jordan

- Engineered a 2000 L vacuum liquid mixer with a double jacket for precise temperature control.
- Designed core components: homogenizer, heat exchanger, CIP (Clean-in-Place) and SIP (Sterilize-in-Place) systems, supply tank, isolation equipment, and impeller, all to pharmaceutical compliance standards.

Pharmaceutical-Grade Liquid Mixer & Ointment–Cream Mixer — Afaq Amman, Jordan

- Designed a double-jacketed pharmaceutical liquid mixer with homogenizer, heat exchanger, CIP system, isolation, and impeller, optimized for performance and compliance.
- Designed an ointment–cream mixer for the pharmaceutical and cosmetic industries, producing ointments, creams, lotions, gels, and toothpaste to industry quality and capacity standards.

3D Sample Mixer — Afaq Amman, Jordan

- Designed and monitored manufacture of a three-dimensional mixer (horizontal, vertical, and angled rotation) for powder mixing, liquid blending, and sample preparation.

MECHANICAL DESIGN & DIGITAL FABRICATION

3D-Printed Aircraft — 3DPAC Competition (UT Arlington) Amman, Jordan | HTU Hackerspace

- Designed a 2.3 m-wingspan glider that achieved the longest flight time in the 3D Printed Aircraft Competition at the University of Texas at Arlington.
- Developed a 3D-print-optimized structure that withstood flight loads without carbon-fiber rods or added reinforcement, with glue-free snap joints for easy assembly and disassembly.

RoboFight Competition — Combat Robots “Deathroll” & “Shredator” Amman, Jordan | HTU Hackerspace

- Supervised the design and build of two combat robots, Deathroll and Shredator, for the RoboFight competition.
- Earned the highest judging score and won Best Design and Best Innovation, with a 2nd-place finish in the arena.
- Applied core mechanical engineering principles throughout — structural optimization, material selection (aluminum grades and other metals), and Design for Manufacturing (DFM).
- Accounted for stress concentration at joints to ensure structural integrity under load.

Desktop & Home-Shop CNC Machines Amman, Jordan | Freelance

- Designed and fabricated multiple desktop CNC machines, tailoring each to client needs with a focus on precision, durability, and ease of use.

4-Axis Clay-Forming CNC Machine Amman, Jordan | Fab Academy

- Designed a 4-axis CNC machine with a rotating disc to automate clay forming, accelerating production and improving accuracy.

Foldable Home-Gym Machine Amman, Jordan | University of Jordan

- CAD model in SolidWorks with finite-element analysis in SolidWorks and Ansys; optimized for reduced production cost under dynamic loading and dimensional constraints.

Generative-Design Drone Structure Amman, Jordan | Fab Academy

- Optimized a drone structure using generative design for maximum performance with minimal material.

Ameno PCB Board Amman, Jordan | Fab Academy

- Designed and fabricated the Ameno PCB, an ATmega328P-based board providing Arduino-compatible functionality.

ROBOTICS

Self-Configuring Modular Robot Amman, Jordan | University of Jordan (Capstone)

- Designed a self-assembling robot built from identical cells, each with five degrees of freedom, that reconfigure to suit a required shape and function.
- Covered module design in Creo, prototyping, control-circuit design, and simulation in Ansys.

Parametric Prosthetic Hand Amman, Jordan | Fab Academy (Final Project)

- Designed a fully parametric prosthetic hand whose dimensions scale to custom size requirements through adjustable CAD parameters.
- Print-in-place structure fabricated in a single FDM stage; actuated by 12 servo motors driven via EMG signals.

Soft-Robotics Hand Amman, Jordan | Fab Academy

- Built a soft-robotic hand via silicone casting and precise 3D modeling, integrating the MIT Media Lab Flow IO device for controlled, coordinated actuation.

TECHNICAL SKILLS

CAD & CAE: SolidWorks, Creo, Fusion 360, Autodesk Inventor, Ansys (static structural), Autodesk Eagle.
Manufacturing: CNC milling & routing, turning, sheet-metal fabrication, argon welding, grinding, polishing, assembly; laser, plasma & water-jet cutting; production-line design.
Digital Fabrication: 3D printing (FDM, SLA, LDM, SLS), laser cutting, vinyl cutting, molding & casting, soft robotics.
Software & Other: Cura, V-Carve, Inkscape, Photoshop, MS Office; PCB design (ATtiny / ATmega).