

ABDULLAHI ABUBAKAR AHMED

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Mechanical Engineer — Sustainable Energy — Solar PV — Engineering Modelling — Academic Research

Academic Profile

Mechanical engineer with an M.Sc. in Mechanical Engineering and postgraduate specialization in Sustainable Energy. Research and technical experience in renewable energy systems, solar PV design, numerical modelling, hydrogen storage simulation, MATLAB/Python programming, experimental measurement, technical documentation, QA/QC inspection, and engineering data analysis.

Interested in PhD and academic research positions related to sustainable energy systems, photovoltaic microgrids, energy management, engineering modelling, experimental validation, digital manufacturing, reliability, and applied research for sustainable development. Strong motivation to contribute to research that connects engineering innovation with practical energy access challenges in Africa and other developing regions.

Research Interests

- Sustainable energy systems, photovoltaic microgrids, renewable energy integration, and energy storage.
- Solar PV modelling, rural electrification, demand-side management, and community energy systems.
- Numerical modelling, simulation, experimental validation, hydrogen systems, and applied engineering research.
- Additive manufacturing, digital manufacturing, quality control, and industrial innovation.

Education

European Specialization School – SkillBill

Oct 2024 – Feb 2026

Master Universitario di I Livello in Sustainable Energy, 60 ECTS

Grade: A

Focus: sustainable energy systems, hydrogen technologies, renewable fuels, energy storage, sustainable mobility, circular economy, and energy management.

Final Project: *Hydrogen Refuelling Stations, Storage Tank Behaviour, and Adiabatic Blowdown Simulation*. Developed a MATLAB model of a 700-bar Type IV hydrogen tank using mass and energy conservation equations, RK4, and ode45.

University of Tuscia, Italy

Sept 2022 – May 2025

Master of Science in Mechanical Engineering, 120 ECTS

Final Grade: 98/110 — Language of instruction and examination: English

Relevant coursework: advanced manufacturing, machine design, virtual prototyping, numerical thermo-fluid dynamics, sensors and data acquisition, non-destructive testing, environmental monitoring, and project/industrial management.

Thesis: *Use of Non-contact Techniques to Estimate the Distortion of Parts Built by Additive Manufacturing, Particularly Polymeric FDM*.

Somali National University, Somalia

Feb 2017 – Mar 2022

Bachelor's Degree in Mechanical Engineering

Final Grade: 110/110

Thesis: *Analysis of the Factors Influencing Fuel Consumption in Passenger Vehicles*.

Mogadishu University, Somalia

Sept 2019 – Oct 2020

Professional Diploma in Project Management

Focus: project planning, scheduling, budgeting, risk management, monitoring, reporting, and evaluation.

Research Experience

Research Intern – Additive Manufacturing and Reverse Engineering Oct 2024 – Feb 2025
University of Tuscia, Viterbo, Italy

- Supported research on FDM additive manufacturing, dimensional accuracy, prototype development, and design-for-additive-manufacturing methods.
- Applied SolidWorks and AutoCAD for modelling and CAD-based interpretation of measured deviations.
- Developed skills in experimental planning, measurement reliability, data interpretation, technical writing, and validation of engineering methods.

Research Project – Dynamic Modelling of Hydrogen Storage Blowdown 2024 – 2025
SkillBill Sustainable Energy Programme

- Developed a MATLAB model for adiabatic blowdown of a 700-bar Type IV hydrogen storage tank under high-pressure discharge conditions.
- Applied mass and energy conservation equations and compared fixed-step RK4 with MATLAB adaptive ode45 solver.
- Analysed transient pressure and temperature behaviour relevant to hydrogen refuelling stations, storage performance, process safety, and thermal behaviour.

Professional Experience

Mechanical Inspector / QA-QC Inspector Oct 2023 – Present
Freelance Consultant, Italy / International

- Perform mechanical inspection and QA/QC documentation for industrial systems, gas vessels, pressure-related equipment, and technical components.
- Prepare inspection reports, maintenance verification documents, compliance records, and technical documentation aligned with ISO, ASME, API, and EN standards.
- Developed practical awareness of measurement accuracy, structured procedures, industrial compliance, safety requirements, and quality verification.

Solar Energy Engineer Feb 2022 – Aug 2022
Tamarso Company, Mogadishu, Somalia

- Supported residential and commercial solar PV projects, including load analysis, system sizing, inverter selection, installation support, testing, site assessment, and performance verification.
- Contributed to practical renewable energy solutions in Somalia, strengthening understanding of solar energy implementation in developing infrastructure contexts.
- Gained field-level exposure to PV performance, customer energy needs, installation constraints, and practical system reliability considerations.

Maintenance Engineer Assistant May 2020 – Nov 2021
Somtel International Ltd, Mogadishu, Somalia

- Supported preventive and corrective maintenance for generators, pumps, HVAC units, and mechanical systems.
- Assisted fault diagnosis, maintenance scheduling, reliability improvement, spare-parts control, and documentation.
- Developed practical experience in operational reliability, mechanical troubleshooting, and technical coordination in industrial environments.

Technical Skills

Programming and Modelling	MATLAB, Python, RK4, ode45, numerical modelling, thermodynamic modelling, engineering data analysis, MS Excel.
Energy Systems	Solar PV design, load analysis, renewable energy systems, hydrogen storage simulation, energy storage, sustainable mobility, energy management.
Research Methods	Laboratory testing, experimental planning, structured-light 3D scanning, non-contact measurement, reverse engineering, CAD comparison, dimensional deviation analysis, prototype validation, technical reporting.
CAD/CAE	SolidWorks, AutoCAD, MS Project, ABAQUS basic, ANSYS Workbench/APDL/Fluent basic.
Quality and Industrial Systems	Mechanical inspection, QA/QC, ISO, ASME, API, EN standards, maintenance documentation, compliance records, risk awareness.

Professional Development

- Additive Manufacturing – University of Michigan, Coursera.
- Digital Manufacturing and Design – University at Buffalo, Coursera.
- Solar Energy and Electrical System Design – University at Buffalo, Coursera.

Scholarships and Awards

- MED-OR Foundation Scholarship for M.Sc. Mechanical Engineering, University of Tuscia.
- Erasmus+ Scholarship for SkillBill Sustainable Energy Programme.

Languages

- Somali: Mother tongue.
- English: Advanced / proficient.
- Arabic: Advanced / proficient.
- Italian: Basic to intermediate.

References

Available upon request.

I authorize the processing of my personal data in accordance with Regulation (EU) 2016/679 (GDPR) for recruitment and selection purposes.