

AMNEH JABER

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Education:

- **M.Sc. Mechanical Engineering (Thermal Fluid Systems)**
Colorado School of Mines Dec. 2019
- **B.Sc. in Mechanical Engineering (Thermal Power)**
Jordan University of Science and Technology Jan. 2017

Work Experience:

- **Mechanical Engineer – Freelance** April 2020 to present
 - Embedded System Programming.
 - MATLAB (Optimization, Symbolic Math, PDE & ODE).
 - Python (Data Analysis, Statistics & Visualization).
 - Mechanical Design & Analysis.
- **Graduate Student Researcher at Colorado School of Mines – Golden, Colorado, USA** May to Dec. 2019
 - Created multiple Colorado School of Mines HVAC building models on OpenStudio.
 - Modeled multiple school of mines buildings in OpenStudio using mechanical drawings.
 - Adjusting model parameters for main and secondary equipment using building automation system data.
 - Validated the model against billing data for electricity, cooling, and heating loads.
 - Analyzed chiller and building energy load data on a central plant loop for multiple Colorado School of Mines buildings.
 - Calculated the electric and cooling loads for the buildings and chillers in a central plant using sensor data from the building automation system.
 - Determined the contribution of several buildings and chillers on the total energy load.
- **Mechanical Project Engineer at Dağgaz– Kocaeli, Turkey** Jan. to Aug. 2018
 - Designed Piping and Instrumentation Diagrams (P&ID) for odorizing and chemical injection systems.
 - Created and managed material lists for designed systems.
 - Examined and analysed tender documents.
 - Wrote up technical quotations with summary of the deliverables for multiple projects.
- **Mechanical Engineering (Intern) at Queen Alia International Airport – Amman, Jordan** Jun. to Sept. 2016
 - Received hands on HVAC engineering training at the central utility plant HVAC unit.
 - Gained some design for manufacturing experience at the workshop and welding unit.
 - Became familiar with the water filtering and disinfection process at the wastewater treatment plant.

Relevant Projects:

- **Performed a study to evaluate the use of vehicle to grid technology as a solution to grid instability problems.**
 - Simulated a set of residential units using BEOpt and scaled the set to simulate the entire grid.
 - Recreated a problematic daily demand curve (Duck Curve).
 - Simulated the effect of vehicle to grid use on battery degradation over time.
 - Studied the effect of optimized vs. unoptimized charging of the vehicle on the grid.
 - Calculated the vehicle to grid adoption costs and a time of use electric utility schedule to balance it out.
- **Designed and analysed a passive electric vehicle battery cooling solution.**
 - A single prismatic cell of a lithium ion battery was modeled along with an integrated cooling fin.
 - The single cell model was expanded to a full battery pack simulation using symmetry conditions.
 - Effectiveness of the cooling solution was assessed at different vehicle speeds using CFD analysis for airflow data.

- **Performed a computational fluid dynamic analysis on a Francis turbine blade design using ANSYS CFX.**
 - Optimized meshing parameters and generated the mesh for the geometry.
 - Setup the solver parameters then configured boundary and initial conditions.
 - Validated the Francis turbine model against prior work.
 - Showed different case studies for different mass flow rates and studied pressures variations.
- **Used BEOpt to perform an energy footprint optimization study on a fitted house model.**
 - Modeled my apartment using BEOpt (a 2-story apartment unit).
 - Calibrated the model to match measured utility data.
 - Found the most cost-effective retrofit package that will reduce energy usage while having a low payback period.
- **Performed a transient CFD analysis on air distribution through a house using ANSYS Fluent.**
 - Created a geometry of the conditioned space in ANSYS design modeler.
 - Optimized meshing parameters and setup the solver parameters with the boundary conditions.
 - Simulated the model and created velocity contours and streamline plots.
- **Performed an optimization study of a thermophotovoltaic system for a commercial building.**
 - Found the inclined irradiation, the peak solar hours, and calculated the derating values for the site.
 - Found the load required by the building, then determined the number of parallel and series modules needed.
 - Sized the inverter and calculated the payback period.
- **Created a balancing robot with obstacle avoidance.**
 - Designed the mechanical assembly of the robot using Fusion 360 and adjusted component placement to increase the moment of inertia while minimizing weight.
 - Assembled the robot and built the circuit to measure distance from an ultrasonic sensor, read inertial data from an IMU, and drive two motors.
 - Programmed an Arduino microcontroller to balance the robot using a PID feedback loop and avoid obstacles.

Engineering Skills:

- Thermodynamic systems analysis and design (HVAC, Engines, Combustion, chemical and phase equilibrium).
- HVAC system design and building energy modeling.
- Design and simulation of fluid mechanical systems.
- Basic budgeting and engineering economic skills.
- Finite element analysis of mechanical and thermal systems.
- Mathematical modeling and basic control design of dynamic systems.
- Working knowledge of strain gauges, differential amplifiers, oscilloscopes, and other instrumentation equipment.
- Ability to work on advanced algebraic, differential, numerical and nonlinear mathematical problems.
- Hands on machining experience (lathes, milling machines, hobbling machines).
- Battery and fuel cell design and simulation.

Computer Skills:

- CAD and FEA packages: Fusion 360, PTC Creo, AutoCAD, SolidWorks, ANSYS CFX, ANSYS Fluent.
- Programming languages: Python, Arduino (C/C++), MATLAB, EES, PTC Mathcad, HTML/CSS.
- HVAC thermal modeling and simulation: OpenStudio, BEOpt, Autodesk Revit.

Languages:

- Arabic: Native proficiency.
- English: Full Professional working proficiency.
- Turkish: Elementary proficiency.