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 (Balancing robot with obstacle avoidance, Secret Door, 7-day time programmable relay panel, Smart button sequence lock).
  - Matlab (Optimization, Symbolic Math, PDE & ODE).
  - Python (Data Analysis, Statistics & Visualization).
  - Mechanical Design & Analysis.

- Graduate Research Assistant at Colorado School of Mines – Golden, Colorado, USA

  May to Dec.2019
  - Created multiple Colorado School of Mines HVAC building models on OpenStudio.
    - Created weather files from NREL weather data.
    - Modeled multiple school of mines buildings on OpenStudio by revising mechanical drawings and building automation systems.
    - Adjusting parameters for main and secondary equipment.
    - Compared billing data for electricity, cooling and heating loads with the results from the modeled OpenStudio building.
  - 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.

- Project Mechanical Engineer at Daggaz Gas Odorizing and Chemical Dosing Systems – 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 Airport International Group - 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 residential units on BEOpt and scaled 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.
  - The effectiveness of the cooling solution was assessed at different vehicle speeds.

- Performed a computational fluid dynamic analysis on a Francis turbine blade design using ANSYS CFX.

- Optimized meshing parameters and generated the mesh on 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.
  - Used that model to find the most cost-effective retrofit package that will reduce the site's 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 a room with one partition, a diffuser, and a vent on ANSYS.
  - 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 and the peak solar hours for the site.
  - Estimated 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 obsticle avoidance.Found the inclined irradiation and the peak solar hours for the site.
  - 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 using the ultrasonic sensor.

Engineering Skills:

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

Computer Skills:

- CAD and FEA packages: Fusion 360, PTC Creo, AutoCAD, SolidWorks, ANSYS CFX, ANSYS Fluent: Sketch. Experience in solid modeling, assemblies, thermal, stress, and dynamic modal finite element analysis.
- Programming languages: Python, Arduino (C/C++), EES, PTC Mathcad, HTML/CSS, MATLAB.
- HVAC thermal modeling and simulation: OpenStudio, BEOpt, Autodesk Revit.

Languages:

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