AMNEH JABER

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Education:

- **M.Sc. in 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:

- **Research & Development Engineer at Alarko | Carrier – Kocaeli, Türkiye** Feb 2021 to Present
  - Performed analysis, defined requirements, and supported aeraulic and thermal testing on fan coil units.
  - Developed and implemented new methods that significantly improved the product design and system optimization process by integrating Python scripts with Excel datasheets.
  - Worked on defining new equipment calibration and operation procedures, and organized work among lab personal to ensure that tests are completed correctly, in a timely manner, and in accordance with regulatory standards.
  - Improved the modular selection programs for Airovision and WinCoil products by developing improved model-based logic that pairs customer application performance requirements with matching products.
  - Technically evaluated deviation permits and product design changes and ensured the continuity of Eurovent certification on fan coil units.

- **Mechanical Engineer – Freelance (Upwork) | Tyler, Texas, USA** April to Sep.2020
  - Python development, embedded system programming (C/C++), and mechanical system design.
  - Relevant Freelance Projects:
    - Designed and developed the code of a hidden door linear actuator, driver, and control panel.
    - Wrote the embedded code for an AC relay driver panel with user programmable 7 day rolling window.
    - Designed and selected the components of a telescoping optical thermometer for Covid-19 screening.

- **Graduate Student Researcher at Colorado School of Mines – Golden, Colorado, USA** Feb 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.
  - 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 on a grid level (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.

- **Mechanical Project Engineer at Dağgaz– Kocaeli, Türkiye** 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.
  - Worked alongside engineers in the wastewater treatment plant, studied requirements, and became familiar with the filtering and disinfection process.

Relevant Projects:

- **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.

- **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.

- **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 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.
- 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.
- Battery and fuel cell design and simulation.

Computer Skills:

- CAD, FEA and CFD packages: 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, Airovision Builder, WinCoil, Coil PC.

Languages:

- Arabic: Native proficiency.
- English: Full professional working proficiency.
- Turkish: Limited working proficiency.