Mohammad Odeh

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EDUCATION

University of Central Florida **May, 2024 (*Projected*)**
Ph.D. Mechanical Engineering *Orlando, FL*
- Dissertation: *Modeling and Simulation of a Control-oriented, Reconfigurable, and Acausal Floating Turbine Simulator (CRAFTS) with Quantitative Feedback Theory (QFT) Robust Control*

University of Central Florida **May, 2020**
M.S. Aerospace Engineering — Thermofluids *Orlando, FL*
- Thesis: *Dynamic Modeling and Simulation of a Power Plant Steam Condenser on the Siemens' SPPA-T3000 Platform*

University of Central Florida **December, 2018**
B.S. Mechanical Engineering — Energy Systems *Orlando, FL*
- *Summa Cum Laude*; 4.0/4.0 GPA
- College of Engineering Top Honor Graduate

PUBLICATIONS

Journal Articles

- Odeh M, Mohsin K, Ngo T, Zalkind D, Jonkman J, Wright A, Robertson A, Das T. (2023). "Development of a Wind Turbine Model and Simulation Platform Using an Acausal Approach: Multiphysics Modeling, Validation and Control", *Wind Energy 2023*, 1 - 27. doi: 10.1002/we.2853

- Mendoza N, Robertson A, Wright A, Jonkman J, Wang L, Bergua R, Ngo T, Das T, Odeh M, Mohsin K, Flavia FF, Child B, Fowler M, Goupee A, Kimball R, Lenfest E, Viselli A. (2022). "Verification and Validation of Model-Scale Turbine Performance and Control Strategies for the IEA Wind 15-MW Reference Wind Turbine", *Energies 2022*, 15, 7649. doi: 10.3390/en15207649

- Odeh M, Levin D, Fenoglietto F, Inziello J, Mathur M, Hermsen J, Stubbs J, Ripley B. (2019). "Methods for Verifications of 3D Printed Anatomic Model Accuracy Using Cardiac Models as an Example", *3D Printing in Medicine*. doi: 10.1186/s41205-019-0043-1

Conference Proceedings

- Mohsin K, Odeh M, Ngo T, Das T. (2023) "Load Reduction of Wind Turbines Using Integrated Torque, Collective Pitch, and Individual Pitch Control Actions". *2023 American Control Conference (ACC)*, San Diego, CA, USA, 2023, pp. 1505-1510, doi: 10.23919/ACC55779.2023.10156361.

- Mohsin K, Odeh M, Ngo T, Das T. (2022). "Causality-Free Modeling of a Wind Turbine with Open-loop and Closed-loop Validation Results". *IFAC-PapersOnLine*, 55(37), 86-91. doi: 10.1016/j.ifacol.2022.11.166

- Boutelle M, Fenoglietto F, Odeh M, Stubbs J. (2019). "Cost Effective Laparoscopic Trainer Utilizing Magnetic-Based Position Tracking". *2019 Design of Medical Devices Conference*. doi: 10.1115/dmd2019-3212

- Odeh M, Nichols E, Fenoglietto F, Stubbs J. (2018). "Real-Time, Non-Contacting Position Tracking of Medical Devices and Surgical Tools through the Analysis of Magnetic Field Vectors", *2018 Design of Medical Devices Conference*. doi: 10.1115/dmd2018-6862

Master's Theses and Ph.D. Dissertations

- Odeh M. (2020). "Dynamic Modeling and Simulation of a Power Plant Steam Condenser on the Siemens SPPA-T3000 Platform", *Electronic Theses and Dissertations, 2020-*. 447. https://stars.library.ucf.edu/etd2020/447

WORK EXPERIENCE

Hybrid Sustainable Energy Systems (HySES) Laboratory **January 2019 – Present**
Graduate Research & Development Assistant (R&D) *Orlando, FL*

- Developed a dynamic behavior, control-oriented, reconfigurable, and acausal floating turbine simulator with QFT based robust controls (**DOE/ARPA-E project**).
    - Verified physics-based modular library against the National Renewable Energy Laboratory (NREL) industry-standard OpenFAST platform coupled with the ROSCO controller, and the Floating Offshore-wind and Controls Advanced Laboratory (FOCAL) experimental data.
- Developed a dynamic behavior model of a steam condenser based on mechanical and thermal balance of plant of a Siemens operated power plant **(Siemens Energy Inc. project)**.
    - Validated model against data from the Panda Stonewall combined cycle power plant (CCPP) over a wide range of operating conditions.
    - Incorporated model into a larger scale digital twin of the Panda Stonewall CCPP containing heat recovery steam generator (HRSG), steam turbine, and pump models.

Institute for Simulation & Training (IST) **June 2016 – December 2018**
Research & Development Engineer (R&D) *Orlando, FL*

- Lead R&D engineer for the Augmented Medical Devices (AMD) project (**NBME project**).
- Spearheaded the signal synchronization, blending, mixing, and overlaying of augmented reality techniques.
- Collaborated with a cross-functional team of designers, engineers, and medical professionals to meet design requirements and medical standards.
- Leveraged 3D printing, CAD modeling, and rapid prototyping for functional prototypes development and evaluation.

Center for Advanced Turbomachinery and Energy Research (CATER) **August 2018 – December 2018**
Research Assistant *Orlando, FL*

- Designed controls and instrumentation systems for experimental set-ups, including programming, troubleshooting of sensors, data acquisition, analysis, and interpretation.

Florida Space Institute (FSI) **January 2018 – December 2018**
Senior Design, Controls & Instrumentations Systems Lead *Orlando, FL*

- Directed the development of a robust controller for an autonomous microgravity platform.
- Collaborated with multi-disciplinary teams to meet customer requirements and regulatory standards.

SKILLS & COMPETENCIES

- **Languages:** Arabic (*Native*), English (*Native*), and Spanish (*Intermediate*).
- **Technical Skills:**
    - Robust, optimal, and QFT based control systems.
    - Modal and harmonic vibrational analysis.
    - Rigid body dynamics modeling and simulation.
    - Heat transfer modeling and simulation.
- **Software:**
    - **Engineering:** Dymola, SPPA-T3000, MATLAB, Simulink, MathCAD, OnShape, SolidWorks, Fritzing.
    - **Programming Languages/Software:** Modelica, Python, C, C++, Julia, Processing, Wiring, git, svn.
    - **Development Platforms:** Essential microcontrollers and embedded system platforms.
    - **Operating Systems:** Proficient in Linux, macOS, and MS Windows.
    - **Miscellaneous:** Schematic design, engineering drawing, printed circuit board design, 3D printing, front-end development (HTML and JS).