Sepehr Ramezani

Sepehr.ramezani@ucf.edu | FL, US | Portfolio | git | LinkedIn

SUMMARY

With a PhD in mechanical engineering and over 7 years of hands-on experience, I specialize in the design and development of mechanical systems and medical devices. Proven ability to translate innovative concepts into tangible assets using CAD modeling, simulation, and FEA analysis. Strong communication skills demonstrated through effective documentation. My expertise extends to the fields of system modeling, controls, and robotics. I've had the opportunities to design a variety of robots, from mobile robots to humanoid robots.

SKILLS

Cross functional team leadership. Expertise with MATLAB, Simulink, Simscape, Real-time environment, CATIA, SOLIDWORK, CAD/CAE. Familiar with Abaqus, C, Worked With DAQ, Embedded boards, IMU, force/torque sensors, DC and servo motors, linear motors, Pneumatic/hydraulic actuators, and valves.

EXPERIENCE

Mechanical Engineer, *Siemen Healthineer*, May 2023 - Sep 2023, MA, US (contractor)

I contributed to the development of a remotely controlled robotic system designed for performing endovascular surgery using catheters.

- Enhanced the precision of the robot's model by incorporating nonlinear factors.
- System identification was performed on the digital twin of the robot to adjust the model parameters.
- Successfully developed an algorithm to estimate the external force applied to the system with maximum error of 3%. The estimated force enables the operator to gain a sense of the force value during operation.
- Involved in 3D tolerance analysis on robot's components, preventing error accumulation and ensuring precise endpoint movement.
- Worked with Model Based Desing (MBD), CETOL and PDM.

Researcher, *Rehabilitation Engineering and Assistive Device Lab*, Aug 2019 – Aug 2023, Orlando, FL

- Utilizing advanced optimization algorithms in OpenSim Moco, I determined muscle-tendon parameters during isokinetic knee flexion.
- Employed an optimization algorithm to adjust wrapping objects and determine subject-specific muscle moment arms for the gastrocnemius muscles.
- Analyzed the performance of a knee brace on absorbing the shock during jumping.
- Developed an affordable device to measure the stiffness of ankle foot orthosis. (Published paper)
- Designed a robotic prosthetic foot capable of providing variable stiffness around ankle. (US Patent)
- Developed a servosystem to create a variable stiffness orthosis using 3-points bending mechanism.

Staff Mechanical Engineer, *Saadat Co.,Ltd*, Sep 2015 – Oct 2019, Tehran, IR

- Led a team of top talented people to design and produce medical devices such as ECG, Defibrillator, Monitor and Suction based on medical standards such as ISO13485 and IEC60601.
- Coordinated efforts of multidisciplinary team including marketing, design, clinical, regulatory, manufacturing, quality, R&D and testing to complete product development projects.

- Managed Design Control activities, DHF, Advanced Product Quality Planning (APQP), V&V plan, FMEA, Clinical evaluation, Risk management (hazard analysis).

Senior Mechanical Engineer, *Saadat Co.,Ltd*, Sep 2013- Sep 2015, Tehran, IR

I was involved in the design of a life-support surgical ventilator that was successfully mass-produced and played a pivotal role in saving numerous lives during the pandemic.

- Designed various mechanical parts of the surgical ventilator such as safety and exhalation valves.
- Implemented GD&T principles to reduce assembly-related failures.
- Engaged in various phases of the design process including problem definition, conceptual design, DFA, DFM, details design, verification and producing drawings for manufacturing.
- Prepared technical documents such as Verification &Validation plans, test reports, technical drafting, manufacturing process instructions, OPC, BOM.
- Designed pneumatic circuit of a surgical ventilator and implemented a gain scheduling PID controller along with a PI hysteresis compensation to provide desired air pressure and flow into patient's lung.

Mechanical Engineer, Bio-Inspired System Design Lab, Feb 2013- Feb 2015 years, Tehran, IR

I was involved in designing and developing of humanoid robots. I have been honored with multiple awards in international robotic competitions.

- Designed a lightweight structure compatible with smart servo motors to create 20 degrees of freedom for a teen-size humanoid capable of playing soccer autonomously.
- Designed and fabricated a customized body cover for a kid-sized humanoid robot to achieve a human-like appearance and body.
- Designed a 3 fingers robotic mini hand using cable and pully mechanism and smart servo motors.
- Studied the walking algorithm of humanoid robot to develop a walk engine and generates motion trajectory for stable walking as well as other special motions such as kicking, jumping, push recovery.

Researcher, New Technologies Research Center (NTRC), 2011-2013, Tehran, IR

- Mathematical modeled a none-linear servo-pneumatic system applicable in medical industries such as MRI- compatible actuators.
- Designed different test setups for system identification and estimate the unknown parameters.
- Designed a nonlinear observer/controller for the servo-pneumatic system to position tracking.
- Involved in cad modeling of variable displacement swash-plate hydraulic pumps, as well as the mathematical model of the pump in Simulink.

EDUCATION

Ph.D., Mechanical Engineering, University of Central Florida, Orlando, FL