ZHENGYANG (KRIS) WENG

https://www.linkedin.com/in/zkweng

6149 N Broadway Street Apt 500, Chicago, Illinois wengmister@gmail.com

EDUCATION

Georgia Institute of Technology, Woodruff School of Mech. Eng. *Sept. 2016 – May 2021*, Atlanta, GA

- B.S. in Mechanical Engineering

Northwestern University, McCormick School of Engineering *Sept 2024 - TBD*, Evanston, IL

- M.S. in Robotics

EMPLOYMENT

Senior Mechanical Engineer, Johnson & Johnson MedTech *Oct 2022 - Present*, Redwood City, CA

- MONARCH Endoscopic Surgical Platform System Hardware R&D.
  - Subject Matter Expert on robotic arm and instrument driver. Developed robotic hardware and test fixtures for system characterization. Developed system requirements for V2 system.
  - Designed an instrument-patient introduction device and workflow. Developed requirements, specifications, and design embodiments.
  - Developed prototype fluid management systems for Monarch Urology procedures.
- MONARCH Software Robotics & Control R&D. Part-time resource.
  - Developed production software for implementing a new robotic arm calibration workflow, greatly reducing time needed for field service calibration.
  - Developed prototypes for intra-operation robot arm admittance visualization.
  - Generated SDD, SRS and other documentations to support production software development.
- Provided engineering support to CAPA investigations and Supplier Change Evaluation for QA/QE.

Senior Mechanical Engineer, Neocis Inc. *Aug 2022 – Oct 2022*, Miami, FL

- System integration lead. Robotic system development for the next generation dental surgical platform.
  - Developed a supervised learning based redundant robot arm calibration optimization method which greatly improved accuracy and robustness of the calibration model.
  - Developed an inverse kinematic solver for kinematic control of a redundant robot arm to achieve obstacle avoidance through null space manipulation and multiple-endpoint user input.
- Provided training and support to new-hires and interns on the hardware team.

Mechanical/Robotics Engineer, Neocis Inc. *June 2021 – Aug 2022*, Miami, FL

- Designed robotic systems for the next generation dental surgical platform. Spearheaded the development of the main actuated robot guidance arm.
  - Designed and developed extremely compact joint actuators for 7-dof robotic arm and a physical human-robot interface end-effector capable of providing haptic and visual feedback to users.
  - Created system specs using numerical simulation and performed kinematic and load analysis.
- Interfaced with multiple OEM suppliers to generate custom solutions for extremely compact robotic subsystems. Created functional prototypes and V&V processes to validate custom solutions.
- Led internal design reviews and processed design documents and transfers.
  - Performed static and fatigue FEA to validate design feasibility.
  - Exercised GD&T and performed tolerance analysis simulation to address DFM concerns.
- Developed, built, debugged, and calibrated 3 generations of prototype systems.
- Provided engineering support to field and manufacturing issues, and generated ECO/ECRs for QA/RA.
- Mentored summer interns through their projects and provided trainings to onboard hardware new-hires.

Mechanical Engineer Co-op, Harmonic Bionics Inc. *May 2020 – Dec 2020*, Austin, TX

- Designed robotic systems for Harmony SHR, a 14-DoF rehabilitative upper extremity exoskeleton.
  - Developed linear sizing mechatronic systems, and prototyped test fixtures for sensor characterization.
  - Developed a physical human-robot interface pendant with ergonomic features assisting system-user interaction. Designed a modular base concept for greater user compatibility.
- Performed system compliance analysis for IEC 60601 and created solutions for design revision.
  - Performed static, fatigue and nonlinear dynamic analysis for structural and cosmetic parts under various loading and impact conditions using FEA.
- Set up company machine shop, compiled machining safety standard and trained the engineering team with shop equipment.

Special Consultant, TOYOTA Motor North America *June 2017 – Aug 2017*, Plano, TX

- Designed an on-demand transit solution for vulnerable communities in Dallas Fort-Worth Area. Interviewed target population and created numerical simulation for the service model.
- Connected service providers and integrated vehicle fleet.
- Winner of 2017 Toyota Mobility Foundation + Net Impact Next Generation Mobility Challenge.
- US Patent US20210150434A1

EXPERIENCE

Undergrad Research Assistant | Design Team Lead, GT LIDAR Lab *Apr. 2019 – May 2021*, Atlanta, GA

- Led the development and build of Athena, a 28-DoF biomimetic upper body robot:
  - Led design and integration of gen 2 Athena's subsystems, validated design with finite element analysis (FEA) and design failure mode and effect analysis (DFMEA).
  - Led system integration of gen 1 Athena with other robots in the lab, including Cassie lower limb robot from Agility Robotics and Athena head unit.
  - Topologically optimized additively manufactured parts to achieve higher stiffness-to-weight ratio.
  - Improved mechatronics systems to achieve faster response and more robust joint performance.
- Set up part numbering system and created remote repository for CAD models.
- Recipient of President's Undergraduate Research Award (PURA) and winner of IEEE/ASME AIM 2020 Best Late Breaking Results Poster.

Undergrad Research Assistant, GT EPIC Lab *Dec. 2016 – Jan. 2018*, Atlanta, GA

- Designed and manufactured mechanical systems of a 2-DoF gait assistive hip exoskeleton for stroke patient recovery in the Exoskeleton and Prosthetics Intelligent Control Lab:
  - Prototyped and machined housing and elastic element (glass fiber leaf spring) for the core series elastic actuator.
  - Designed and machined patient attachment and a safety stand for the device.
  - Set up and participated in trials to validate device's efficacy in reducing metabolic cost of assisted walking.

Design Team Member, GT Vertically Integrated Project (VIP) *Jan. 2017 – Dec. 2018*, Atlanta, GA

- Designed chassis and power train components for Submarine Robot sub-team on Spring 2017.
- Prototyped chassis, PCB, and camera components for Autonomous Vehicle sub-team on Fall 2018.

Suspension Team Member, GT Motorsports *Sept. 2016 – June. 2017*, Atlanta, GA

- Designed and machined suspension system components for FSEA formula racer Car 43.

SKILLS

Software:

Mechanical Design: SolidWorks (CSWE, highest certification), OnShape, AutoCAD, Fusion 360, 3DExperiance

Design Analysis: SolidWorks FEA, ANSYS, LS-DYNA, 3DCS VA, nTopology

CAM and Additive Manufacturing: SolidWorks CAM, SurfCAM, Mach 3 CAM, Cura, Preform, InkScape

Lab and Testing: LabVIEW, TI CCS, MCUs, Ingenia MotionLabs, EC Engineer, Minitab

Planning and Administration: SolidWorks PDM, Jira, Asana, Git, Microsoft Office Package, Google G Suite, Arena PLM, Agile EC/PLM

Language: Python (Pandas, PyBullet, tf/keras), C++, MATLAB/Octave, R

Hardware:

Machining: milling, lathing, water-jetting, laser-cutting/engraving, 3D printing (FDM, SLA, SLS, MJF), general shop practices

Electrical: Circuit analysis, signal analysis, oscilloscope, controller design, soldering, reflow soldering

Other: rapid prototyping, industrial design, UI/UX design, leadership, and piano (winner of 2017 GT Symphony Orchestra Concerto Competition)