Cosmo Chou

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Research Interests

Prosthesis and orthosis; soft robotics; assistive devices; posture detection; bipedal locomotion; gait stability; multisensory integration; machine learning; haptic feedback; brain-computer interface; nonlinear control theory.

Education

- **University of Alabama** — Tuscaloosa, AL
  Master of Science in Mechanical Engineering; GPA: 3.5 — *Aug. 2016 – May 2018*
  Thesis: Design and Evaluation of Sensory Instrumentation for Prosthesis Control

- **University of Alabama** — Tuscaloosa, AL
  Bachelor of Science in Mechanical Engineering; GPA: 3.5 — *Aug. 2012 – May 2016*

Research Experience

- **Human-Inspired Biorobotics Lab** — Tuscaloosa, AL
  Graduate Research Assistant — *May 2015 - Present*
  - **Transfemoral Prosthesis Knee Sensor**: Designed and evaluated load cell for the detection of prosthetic knee loading conditions with respect to anterior-posterior loading bias.
    Patent pending, submission in preparation.
  - **Measurement Exo**: Designed and evaluated wearable device for lower extremity with custom modular components for optimal user fit, multiple instrumentation components for user gait and posture detection.
    Submission in preparation.
  - **Sit-to-Stand Assistive Device**: Evaluated and optimized lower-extremity pneumatic orthosis for sit-to-stand assistance.
  - **Smart Walker**: Evaluated and optimized powered walker with mobility controlled by user posture detection via inertial measurement units.

- **Agile Robotics Lab** — Tuscaloosa, AL
  Researcher — *April 2017 - Present*
  - **SLABO**: Standardized fabrication procedure for electromechanically actuated soft robots.
    Submitted to IROS 2018.
  - **INDEX**: Designed and evaluated wearable gesture recognition device for robotics control.

Teaching Experience

- **University of Alabama** — Tuscaloosa, AL
  Department of Mechanical Engineering — *May 2014 - Present*
  - **Lab Instructor - Static Machine Components**: Designed and taught parametric modeling, finite element analysis, and static loading simulation curriculum for SolidWorks.
  - **Lab Instructor - Instrumentation and Control Components**: Taught signal conditioning, force and torque measurement, AC and DC motors, pneumatic system components, programmable logic controllers.
  - **Graduate Teaching Assistant - Dynamic Machine Components**: Graded, proctored, and assisted students with projects and coursework.

Proficiencies

- **Tools & Technologies**: C++, Python, Git, TensorFlow, SolidWorks, MATLAB, PTC Creo, ANSYS, AWS

- **Relevant Knowledge**: CAD, finite element analysis, medical devices, biocompatibility, electromyography, brain-computer interface, recurrent neural networks, predictive algorithms, support vector machines, gait analysis, locomotive biomechanics, rapid prototyping, soft robotics fabrication, pneumatic and electromechanical artificial muscle actuation