Wearable Engineering and Assistive Robotics
CECS - MAE, University of Central Florida

Lab meeting (open to public); First Friday of the month (Sep 3, Oct 1, Nov 5, Dec 3) 5pm; Research 1, Room 101

- **Research areas**
  - 1. Design and Control
    - Wearable device R&D
    - Ergonomic Interface
    - Human-in-the-loop Control
  - 2. Sensing and Learning
    - Wearable sensor networks
    - Statistical & Learning-based Modeling (AI)
  - 3. Human-Robot Interactions
    - Computational modeling and simulation

Aim 1. Enhanced efficiency, safety and user comfort/acceptance of wearable devices
Aim 2. Adaptive control and transparent human-robot interactions through human intention/state detection
Aim 3. Reliable and robust simulation/prediction of human-device system performance

- **Multidisciplinary research Objectives:**
  - T & E s → Design iterations
  - Human biomechanics/physiology
  - Cognition and perception
  - Ergonomics
  - Human factors
  - Physical interface
  - User comfort
  - Fit and function
  - Component integration
  - AI and ROS development
  - Task and motion planning
  - Statistical and learning-based modeling
  - Big data and data mining
  - Mechanism/structure design
  - Static and dynamic modeling
  - Solid mechanics / contact modeling
  - Control architectures
  - Human-robot interactions
  - Composite structure
  - Smart/active materials
  - Additive manufacturing
  - Material selection
  - Fatigue/failure analysis
  - Wearable actuators and sensors
  - Compliant joint/mechanism
  - Energy source (+Chemical Eng.)
  - MEMS and Nano technologies
  - Force and tactile sensing
  - Electronics for operating sensor(s) and actuator(s)
  - Signal filtering/process

- **Experience and skills to gain from WEAR lab research**
  - Robotics and Mechatronics
  - Computational methods (numerical, CAD, C, Java, Python, Matlab, Labview)
  - Machine learning and computer vision
  - Hands-on experience on RoS, instrumentation and evaluation
  - Modeling and analysis (mechanisms, statics, dynamics and control)
  - Wearable prototype design, fabrication and assembly
  - Human movement biomechanics and experimental research design
  - Research method and writing technical documents
  - Multidisciplinary collaboration

- **Expectations**
  - 10+ hours per week on research
  - motivated and self-driven
  - desire to learn and work collaboratively

- **Education – Training – Research**
  - Education (WEAR lab workshop)
  - Training (on- and off-line)
  - Research

- **Contact (QR code)**

- **Udemy courses (49 courses)**
  - Available to all WEAR lab members for self-paced learning

- **Education**
  - Wear@ucf.edu

- **Contact (QR code)**

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- **https://forms.office.com/r/K00i507yiH**