Outline

• UCF Efforts related to Biomedical Engineering
  – Masters of Science in Biomedical Engineering
  – Prosthetics Cluster
  – MEDD (Medical Engineering Biomedical) Program
  – Senior Design Efforts at UCF

• Future UCF-Mayo Clinic Collaborative Efforts
Masters of Science in Biomedical Engineering (MSBME)

- Approved May 2016
- Started Fall 2016
- Enrollment (Fall 2016): 7
- MSBME enrollment (Spring 2017): 12
- MSBME Applicants (Fall 2017): 18

- PhD in BME proposal – in progress over Summer plan to submit pre-proposal to CAVP in Fall 2017
Current Proposed Cluster research themes (for both human and veterinary applications):

- Intelligent Rehabilitation and Assistive Technology
- Advanced Materials
- Smart Implantable Devices
- Innovative strategies for Tissue Repair

• Seven positions: 1 lead (Associate/Full), and 6 junior (Assistant).
• Hired:
  • Elizabeth Brisbois (biocompatible and biocidal materials for medical applications),
  • Kaitlyn Crawford (composite soft materials, artificial muscle fibers and chemical sensing of environmental toxins)
  • Qiushi Fu (biomechanics, sensorimotor control and learning of human movement in upper extremities, bio-inspired robotics),
  • Offer in place for another candidate.
Medicine-Engineering Double Degree (MEDD) Program

• CECS-COM-TBHC partnership strongly supported by Deans.
  – Recognizes that medicine is becoming an increasingly technical field.
  – Prepares physician-engineers to solve medical problems as engineers.

• Program requirements:
  – Baccalaureate degrees in engineering and biomedical sciences.
  – University Honors program.
  – Honors in the Major (undergraduate thesis) program.

• Eligibility:
  – Freshman entering UCF in Fall 2017.
  – Must be accepted by TBHC and then by MEDD Program, too.

• Advantages:
  – CECS accepts required COM courses as electives and vice versa.
  – Guaranteed interview for UCF MD program if MCAT score is at least at the 70th percentile.
MEDD Program (Continued)

- 49 applications from students applying to TBHC.
  - 36 applications submitted for MEDD.
  - 29 applicants accepted by TBHC.
  - 14 applicants accepted by MEDD Program.
  - So far, two positive responses.
    - One male, one female.
    - One local, one from North Carolina.

- Deadline to accept program admission is Monday, May 1.
BME Senior Design Projects

• A Smart-Walker System
  – An economical smart walker that serves as a gait rehabilitation tool for the elderly and disabled.
  – Real-time sensing and feedback to patients on weight-distribution, acceleration and proximity.

• U-Shaped Toothbrush
  – An electric toothbrush attachment that assists the disabled and the elderly in simultaneous brushing of all teeth.
  – Unique U-shaped mouthpiece design with hinged track, an efficient and ergonomic drive mechanism, and curved bristles that allow easy insertion and brushing.
BME Senior Design Projects

• **Soft-Shell Assistive Exo Hand**
  – A pneumatically actuated assistive hand glove that can improve grip strength in people with limited hand flexion-extension abilities and can be integrated with EMG sensors to control user input.

• **Powerless Hand Rehabilitative Device**
  – A low cost hand rehabilitative device that uses removable and adjustable elastic actuators. The design pairs with a docking device that allows user independence and is useful for dystrophy and clenched fists.

• **Powered Upper-Arm Exo-Frame**
  – A powered Bowden drive system that can assist in the motion of the upper arm and can be controlled by EMG sensor input.
Future UCF-Mayo Clinic Efforts

• Collaborations on joint research efforts (happening)
• Research Experiences for UG and G Students
  – UG students
  – MEDD Program
  – MSBME
  – Ph.D. in Biomedical Engineering
• Sponsoring of Senior Design Efforts
  – CECS, CREOL
Opportunity Starts Here