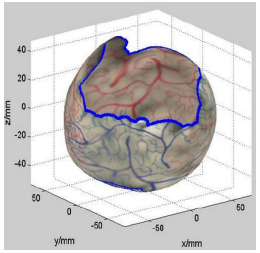
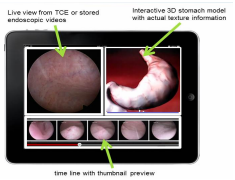


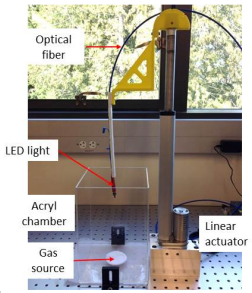


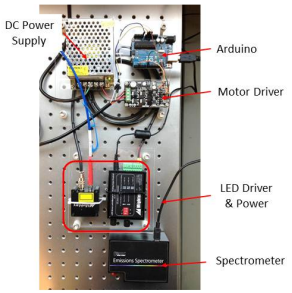
Research at **Smart Medical Devices Lab**

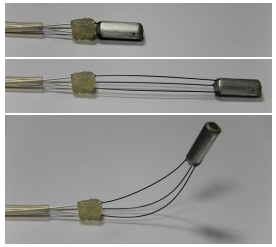
Jong Yoon, School of STEM (wjyoon@uwb.edu), Mechanical Engineering

Projects/Research Description

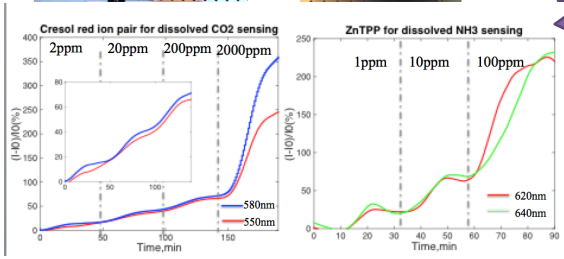
My research interests focus on the design and development of mechatronics systems and their application in medical devices.
Within this area, I am specifically interested in 1) **Multi-modal medical diagnostic devices**, 2) **Minimally Invasive Surgical Robotics and smart User Interface**, and 3) **Assistive Technologies**. Above three components could be tied together synergistically. See example on-going/future projects below.

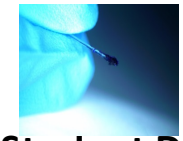




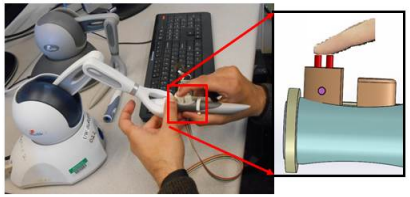


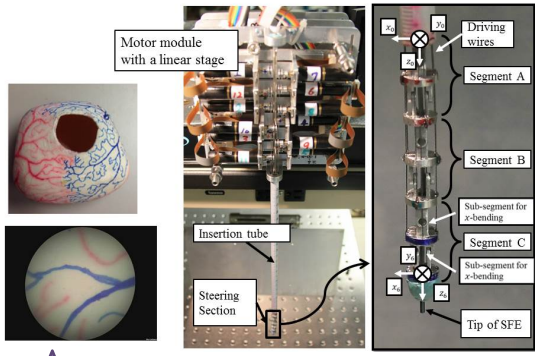
1) Flexible capsule and gas sensor for stomach *H. Pylori* localization





2) Human Perception of Force in robot surgery





1) Robotized Endoscopic system for bladder cancer surveillance

3) Multifunction Toilet Wheelchair

Student Duties

1. Attend weekly research group meetings and present weekly progress
2. Study literature reviews
3. Understand the concept of mechatronics and learn basics of various sensors and actuators
4. Design/fabrication of a novel medical system using different actuators, control interfaces, and 3D printing from scratch.
5. Submit summary reports at the end of each term

Student Qualifications

- Open to freshman through senior.
- Willing to spend 10 hours/week for 3 consecutive quarters
- Innovative thinker and designer

Project Timeframe/Plan

- Initial time frame for each project is one year. However, upon successful completion of the proposed milestones, it will be further extended to following year(s) with updated topics.

Outcomes

- Based upon the fundamentals of analogue and digital electro-mechanical components, students will build a simple but interesting mechatronics systems acquiring basics of programming language for embedded systems
- Students will be able to learn how to professionally present their work and write a report.