

# BIOMEDICAL ENGINEERING

## RESEARCH AREAS

# AREAS

- AI and deep learning
- Biomechanics
- Control systems
- Device development
- Engineering physiology
- Imaging
- Drug development/delivery
- Tissue engineering
- Neural engineering

| Laboratory                                           | Professor                |  | Research                                                                                 | AI and Robotics | Biomedical Engineering | Control Systems | Devices | Engineering | Imaging | Drug delivery | Tissue Engineering | Neural Interfaces |
|------------------------------------------------------|--------------------------|--|------------------------------------------------------------------------------------------|-----------------|------------------------|-----------------|---------|-------------|---------|---------------|--------------------|-------------------|
| Gan Laboratory                                       | Dr. Yu Gan               |  | Machine and deep learning for biomedical image analysis                                  | High            | Low                    | Low             | Low     | Low         | High    | Low           | Low                | Low               |
| Laboratory of Ophthalmic Research Development (LORD) | Dr. Jennifer Kang-Mieler |  | Imaging, hemodynamics, electrophysiology and drug delivery for retinal diseases          | High            | Low                    | Low             | Low     | High        | High    | Medium        | Medium             | High              |
| Translational Lung Bioengineering Laboratory         | Dr. Jinho Kim            |  | Tissue engineering for repairing diseased or damaged lung tissue                         | Low             | Medium                 | Low             | High    | Low         | High    | Low           | Medium             | Low               |
| Speckle Imaging Lab                                  | Dr. Simon Mahler         |  | Optical laser imaging for monitoring blood flow dynamics in the brain and other tissues. | High            | Low                    | Low             | High    | High        | High    | Low           | Low                | High              |
| Movement Control REhabilitation Laboratory (MOCORE)  | Dr. Raviraj Nataraj      |  | Control systems for user integration with rehabilitative movement devices                | Low             | Medium                 | High            | High    | Low         | High    | Low           | Low                | High              |
| Lung Microscopic Mechanics Laboratory                | Dr. Carrie E. Perlman    |  | Surface-tension-reducing therapeutic for ventilation injury in acute lung disease        | Low             | Medium                 | Low             | Low     | High        | High    | Medium        | Low                | Low               |
| Biom mineralization and Biospectroscopy Lab          | Dr. William Querido      |  | Infrared spectral imaging for elucidating bone health                                    | Low             | Medium                 | Low             | Low     | Low         | High    | Low           | Medium             | Low               |
| InBrain Electronics Laboratory                       | Dr. Ilke Uguz            |  | Neural implants for brain-machine interfaces and neurodegenerative diseases              | Low             | Low                    | Low             | High    | High        | Low     | Medium        | Low                | High              |
| Tissue Reconstruction Laboratory                     | Dr. Hongjun Wang         |  | Tissue engineering, including 3D printing of bioscaffolds, and regenerative medicine     | Low             | Low                    | Low             | Low     | Low         | Low     | Medium        | Medium             | Low               |
| Wang Laboratory                                      | Dr. Shang Wang           |  | Optical bioimaging for understanding mammalian reproduction and development              | High            | Low                    | High            | High    | High        | Low     | Low           | Low                | Low               |
| Yu Laboratory                                        | Dr. Xiaojun Yu           |  | Polymeric biomaterials for tissue engineering and drug delivery                          | Low             | Low                    | Low             | Low     | Low         | Low     | Medium        | Medium             | High              |
| Musculoskeletal Control and Dynamics Laboratory      | Dr. Antonia Zaferiou     |  | Biomechanics of mobility and agility for design of human-centered movement training      | Low             | Medium                 | High            | High    | Low         | Low     | Low           | Low                | Low               |