

Master of Science in Biomedical Image Computing (BIC)

Biomedical image computing is a large, rapidly growing industry and research field comprising the formation and analysis of diagnostic images. Both image system design and biomedical image analysis currently are being revolutionized at a tremendous rate by the emergence of machine learning techniques. Offered through the world-renowned University of Illinois Urbana-Champaign, this Master of Science in Biomedical Image Computing degree addresses the need for efficient, rigorous training focused at the intersection of biomedical imaging science, high-performance computing and machine learning.

What Sets This Degree Apart

Comprehensive Coursework

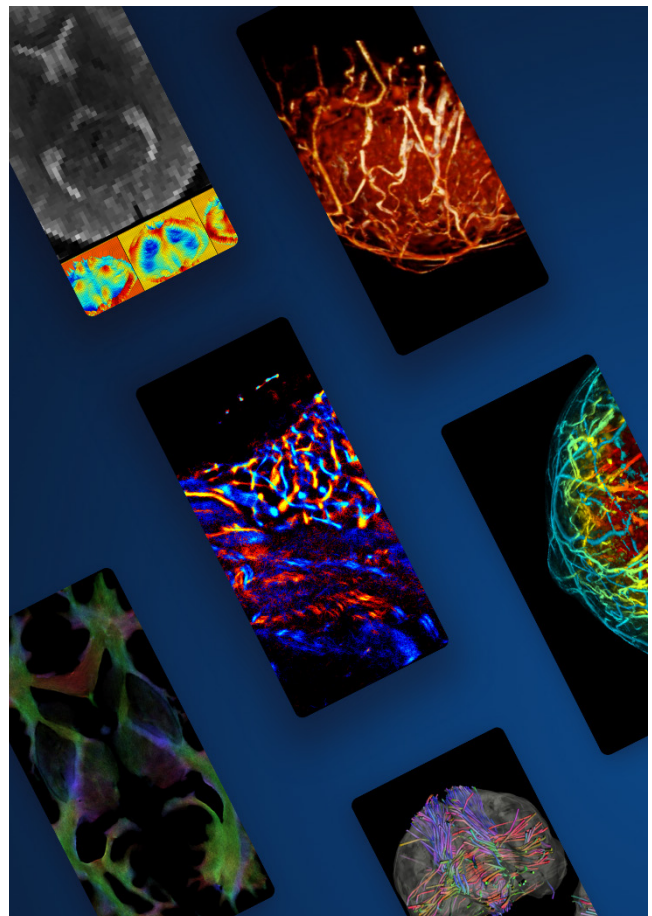
Students will be instantly and completely immersed in the field of imaging science at the confluence of biomedical imaging and machine learning. Graduates from this degree program will find careers as engineers who are developing, translating, and evaluating biomedical imaging technologies that leverage machine learning methods.

Practical Training

Students will gain hands-on experiences with computational imaging and machine learning — throughout the duration of the program and a capstone project — that involve real-world data and problems. They will also receive training in critical aspects of high-performance computing that provide immediate value to them and to employers.

World-class Faculty

This program's innovative curriculum was developed by leading bioengineering faculty members who are actively working with a wide range of modern biomedical imaging modalities in real, well-funded imaging applications.



A Note From the Faculty Program Co-Director

“This program is the first in the nation that provides uniquely integrative training at the intersection of biomedical imaging, computational techniques and machine learning. Our vision is to train a new generation of students and leaders to meet the ever increasing demand of talents from both industry and research institutions in this space.”

- Bioengineering Professor Fan Lam, M.S. BIC Faculty Program Co-Director

Are You...

- An early career engineering professional looking for advanced training in imaging science and machine learning?
- A recent engineering graduate looking to enter the industry with more technical know-how than a traditional entry-level professional?
- An international student looking to differentiate yourself with an advanced degree from a top engineering school?
- Interested in building a career in the medical and health care field?

Then Illinois' Master of Science in Biomedical Image Computing (M.S. in BIC) program is for you!

Degree Requirements

The M.S. in Biomedical Image Computing (M.S. in BIC) program is an intensive professional degree that can be completed in three semesters while on-campus. Students must complete 36 credit hours and are required to take the following core and elective classes.

Curriculum

First Semester

- BIOE 580 Foundations of Imaging Science
- BIOE 483 Biomedical Computed Imaging Systems
- BIOE 485 Computational Mathematics for Machine Learning and Imaging

Second Semester

- BIOE 484 Statistical Analysis of Biomedical Images
- BIOE 486 Applied Deep Learning for Biomedical Imaging
- BIOE 488 Applied High-Performance Computing for Imaging Science
- BIOE 588 Biomedical Image Computing Capstone Project Literature Review

Third Semester

- BIOE 489 Regulations, Ethics and Logistics in Biomedical Applications of Machine Learning
- BIOE 589 Biomedical Image Computing Capstone Project

Electives

Choose one of the following:

- BIOE 586 Deep Generative Models in Bioimaging
- OR
- An elective course from an approved list

Approved Elective Courses:

- BIOE 505 Computational Bioengineering
- BIOE 507 Advanced Bioinstrumentation
- BIOE 597 Individual Study
- CS 543 Computer Vision
- CS 547 Deep Learning
- ECE 534 Random Processes
- ECE 543 Statistical Learning Theory
- ECE 544 Topics in Signal Processing
- ECE 547 Topics in Image Processing
- ECE 549 Computer Vision
- ECE 558 Digital Imaging
- ECE 561 Detection & Estimation Theory
- ECE 564 Modern Light Microscopy
- ECE 569 Inverse Problems in Optics
- ECE 580 Optimization by Vector Space Methods

TO APPLY, VISIT:
BIOENGINEERING.ILLINOIS.EDU