DEPARTMENT OF BIOMEDICAL ENGINEERING
COLLEGE OF ENGINEERING AND APPLIED SCIENCE

RESEARCH OPPORTUNITIES FOR UNDERGRADUATE students

APPLICATION DEADLINE: September 22, 2025

PROJECT TITLE: Pediatric PET/CT Dose Reduction Using Deep Learning

Physical Requirement :
Need to work physically in our lab office

Project's Technical Skills Requirement :
Programming experience in Python; Familiarity with deep learning frameworks like PyTorch or TensorFlow ;Comfort working in Linux environments and using command-line tools

Project's Available Positions : Undergraduate Co-Op position

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Project Description

Biomedical imaging is rapidly transforming both engineering and medicine, and the Emission Tomography Imaging Laboratory at the University of Cincinnati is at the forefront of this innovation. Our lab focuses on developing cutting-edge imaging techniques to improve the quantitative measurement of physiological and biochemical processes in humans and animals. Ultimately, our goal is to generate meaningful evidence that helps understand and treat human diseases.

One of our key areas of research involves hybrid PET/CT imaging, a powerful tool widely used in oncology, cardiology, and neurology. However, because PET and CT both involve ionizing radiation, minimizing patient exposure—especially for children—is a critical challenge.

Our current project aims to reduce radiation dose in PET imaging and eliminate the need for CT scans by leveraging deep learning, specifically diffusion probabilistic models. As a Co-op student, you'll collaborate with researchers in our lab and clinicians at Cincinnati Children's Hospital to develop and refine these AI-based methods. You'll also help evaluate their performance on pediatric patient data, contributing to both scientific

publications and potential clinical applications.

We’re looking for a motivated undergraduate with:
• Programming experience in Python
• Familiarity with deep learning frameworks like PyTorch or TensorFlow
• Comfort working in Linux environments and using command-line tools

This is a unique opportunity to gain hands-on experience in biomedical research, work with real clinical data, and make a meaningful impact in healthcare innovation.