



WASHINGTON UNIVERSITY MCKELVEY SCHOOL OF ENGINEERING
STRATEGIC PLAN TO ACHIEVE LEADERSHIP THROUGH EXCELLENCE

RESEARCH

Imaging Sciences & Technology



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Executive Summary

Defining New Frontiers and Transforming Diagnostic & Therapeutic Imaging

Recently, the School of Engineering & Applied Science and the School of Medicine (WUSM) have launched a \$25 million strategic plan to support researchers across the university as they develop innovative imaging technologies aimed at transforming clinical research and the practice of medicine worldwide. The new initiative strengthens the connection between the Engineering and Medical schools and encourages the development of new technologies and translation of these technologies into clinical use.

The proposed initiative in imaging sciences & technology (IST) should be nucleated by the creation of a dedicated, cross-disciplinary PhD program. Recruiting high-quality graduate students into the program is one of the most important areas for the success of the Imaging Science and Technology Initiative. There is currently only one US institution, Rochester Institute of Technology, that offers a PhD degree in Imaging Science. WashU has the requisite breadth and depth of expertise to train the next generations of imaging scientists and engineers in the mathematical, computational, and modality based imaging physics. SEAS has an Imaging Science Certificate Program, and SEAS and WUSM have a joint Imaging Science Pathway training grant. These activities and programs provide a solid foundation for establishing a PhD program. Such a program will increase the visibility of our Imaging Science program and attract excellent graduate students in both US and overseas.

The proposed initiative should be powered by the creation of two distinctive centers. Computational methods play a central role in the formation of images in modern imaging systems and in image analysis and interpretation. The mission of the Computational Imaging Research Center (CIRC) will be to foster efficient and cooperative cross-college (SEAS and WUSM) research in biomedical imaging. The focus will be on the development and translation of computational methods that improve the effectiveness of clinical and pre-clinical imaging. In addition to co-localizing 8-10 investigators in a common space, the proposed CIRC will require expanded high-performance computing facilities based on graphics processing units (GPU). An Imaging Instrumentation and Sensing Center (IISC) will serve as a bridge for enabling the translation of the device and sensor innovations into applications. The establishment of the center will enhance communication, collaboration, translation of the technologies to patient studies, and efficiently utilize the available resources.