Imaging Science

The PhD in Imaging Science program at Washington University in St. Louis is one of only two such programs in the United States. This program offers an interdisciplinary curriculum that focuses on the technology of imaging with applications that range from cancer diagnosis to virtual reality.

What Is Imaging Science?

Imaging science is an interdisciplinary academic discipline that broadly addresses the design and optimization of imaging systems and the extraction of information from images. It builds on contributions from traditional fields such as biomedical engineering, electrical engineering and computer science as well as from physics, applied mathematics, biology and chemistry.

What Can You Do With an Advanced Degree in Imaging Science?

The high demand for personnel with training in imaging science is reflected in government policy and funding opportunities. Many academic, industrial and national laboratory positions exist for highly qualified candidates. Graduates of the program will be prepared for careers in academic research or in industries that require expertise in the quantitative principles of imaging.

Curriculum Focus

- Mathematical and computational principles of image formation
- Image analysis
- Image understanding
- Image quality assessment

This interdisciplinary program is unique in that it brings together expert faculty from the McKelvey School of Engineering and the School of Medicine to provide students with the freedom and flexibility to learn from leading imaging experts and to engage in impactful research.

History

Washington University has been a leader in the technology and advancement of imaging science for more than 125 years. During the 1920s, Washington University researchers were the first to use X-rays to view the gallbladder. During the 1970s, research by Michel Ter-Pogossian at the university’s Mallinckrodt Institute of Radiology led to the development of the PET scanner.

Website: https://engineering.wustl.edu/academics/programs/imaging-science/index.html

Faculty

Co-Director
Samuel C. Sachs Professor of Electrical Engineering
PhD, University of Notre Dame
Electrical & Systems Engineering

Joe Culver (https://www.mir.wustl.edu/employees/joseph-culver/)
Co-Director
Professor
PhD, University of Pennsylvania
Radiology; Biomedical Engineering

Hongyu An (https://www.mir.wustl.edu/employees/hongyu-an/)
Associate Professor
PhD, Washington University
Radiology; Biomedical Engineering

Beau Ances (https://anceslab.wustl.edu/people/beau-ances-md-phd/)
Professor
MD, University of Pennsylvania
PhD, University of Pennsylvania
Neurology; Biomedical Engineering

Deanna Barch (https://psychiatry.wustl.edu/people/deanna-barch-phd/)
Gregory B. Couch Professor of Psychiatry
PhD, University of Illinois
Psychological & Brain Sciences; Biomedical Engineering

Adam Bauer (https://www.mir.wustl.edu/employees/adam-bauer/)
Assistant Professor of Radiology/Assistant Professor of Biomedical Engineering
PhD, Washington University in St. Louis

Phil Bayly (https://engineering.wustl.edu/faculty/Philip-Bayly.html)
Lilyan and E. Lisle Hughes Professor of Mechanical Engineering
PhD, Duke University
Mechanical Engineering & Materials Science

Janine Bijsterbosch (https://www.mir.wustl.edu/employees/janine-bijsterbosch/)
Assistant Professor of Radiology
PhD, University of Sheffield

Aaron Bobick (https://engineering.wustl.edu/faculty/Aaron-Bobick.html)
James M. McKelvey Professor and Dean
PhD, Massachusetts Institute of Technology
Computer Science & Engineering
Hong Chen (https://engineering.wustl.edu/faculty/Hong-Chen.html)
Associate Professor
PhD, University of Washington
Biomedical Engineering

Yao Chen (https://neuroscience.wustl.edu/people/yao-chen-phd/)
Assistant Professor of Neuroscience
PhD, Cell and Developmental Biology, Harvard University

Adam Eggebrecht (https://www.mir.wustl.edu/employees/adam-eggebrecht/)
Assistant Professor of Radiology
PhD, Washington University in St. Louis

Michael Gach (https://radonc.wustl.edu/faculty/michael-gach/)
Associate Professor
PhD, University of Pittsburgh
Radiation Oncology; Biomedical Engineering

Joel Garbow
Professor of Radiology
PhD, University of California, Berkeley

Aimilia Gastounioti (https://www.mir.wustl.edu/employees/aimilia-gastounioti/)
Assistant Professor of Radiology
PhD, National Technical University of Athens

Geoff Goodhill (https://neuroscience.wustl.edu/people/geoffrey-goodhill-phd/)
Professor of Developmental Biology
Neuroscience

Roch Guérin (https://engineering.wustl.edu/faculty/Roch-Guerin.html)
Harold B. and Adelaide G. Welge Professor of Computer Science
PhD, California Institute of Technology
Computer Science & Engineering

Dennis Hallahan (https://physicians.wustl.edu/people/dennis-e-hallah-an-md-fasco/)
Elizabeth H. and James S. McDonnell III Distinguished Professor of Medicine
MD, Rush University
Radiation Oncology; Biomedical Engineering

Edward Han
Assistant Professor of Neuroscience
PhD, University of California, San Diego

Tim Holy (https://neuroscience.wustl.edu/people/timothy-holy-phd/)
Alan A. and Edith L. Wolff Professor of Neuroscience
PhD, Princeton University
Neuroscience, Biomedical Engineering

Song Hu (https://engineering.wustl.edu/faculty/Song-Hu.html)
Associate Professor
PhD, Washington University in St. Louis
Biomedical Engineering

Geoff Hugo (https://radonc.wustl.edu/faculty/geoffrey-hugo-phd/)
Professor
PhD, University of California, Los Angeles
Radiation Oncology; Biomedical Engineering

Nathan Jacobs
Professor
PhD, Washington University in St. Louis
Computer Science & Engineering

Abhinav Jha (https://engineering.wustl.edu/faculty/Abhinav-Jha.html)
Assistant Professor
PhD, University of Arizona
Biomedical Engineering, Radiology

Tao Ju (https://engineering.wustl.edu/faculty/Tao-Ju.html)
Professor
PhD, Rice University
Computer Science & Engineering

Ulugbek Kamilov (https://engineering.wustl.edu/faculty/Ulugbek-Kamilov.html)
Assistant Professor
PhD, Ecole Polytechnique Fédérale de Lausanne, Switzerland
Computer Science & Engineering; Electrical & Systems Engineering

Gregory Lanza (https://cardiology.wustl.edu/faculty/gregory-m-lanza-md-phd-facc/)
Oliver M. Langenberg Chair, Distinguished Professor of the Science and Practice of Medicine
MD, Northwestern University
PhD, University of Georgia
Medicine; Biomedical Engineering

Richard Laforest (https://www.mir.wustl.edu/employees/richard-laf orest/)
Professor
PhD, University of Laval, Canada
Radiology

Matthew Lew (https://engineering.wustl.edu/faculty/Matthew-Lew.html)
Assistant Professor
PhD, Stanford University
Electrical & Systems Engineering

Jin-Moo Lee
Andrew B. and Gretchen P. Jones Professor of Neurology
MD/PhD, Weill Cornell Medical College
Biomedical Engineering; Neurology; Radiology

Daniel Marcus (https://www.mir.wustl.edu/employees/daniel-marcus/)
Professor
PhD, Washington University
Radiology; Biomedical Engineering
Christine O’Brien (https://engineering.wustl.edu/faculty/Christine-OBrien.html)
Instructor in Radiology
PhD, Biomedical Engineering, Vanderbilt University

Philip Payne (https://publichealth.wustl.edu/scholars/philip-r-payne/)
Robert J. Terry Professor
PhD, Columbia University
Medicine; Biomedical Engineering

David Piston (https://pistonlab.wustl.edu/)
Professor
PhD, University of Illinois
Cell Biology & Physiology; Biomedical Engineering

Barani Raman
Professor
PhD, Texas A&M University
Biomedical Engineering

Joshua Shimony (https://profiles.wustl.edu/en/persons/joshua-shimony/)
Professor of Radiology
PhD, University of Tennessee
Department of Radiology

Kooresh Shoghi (https://www.mir.wustl.edu/employees/kooresh-shoghi/)
Professor
PhD, University of California, Los Angeles
Radiology; Biomedical Engineering

Monica Shokeen (https://www.mir.wustl.edu/employees/monica-shokeen/)
Assistant Professor
PhD, Washington University
Radiology

Aristeidis Sotiras (https://www.mir.wustl.edu/employees/aristeidis-sotiras/)
Assistant Professor of Radiology
PhD, Ecole Centrale Paris

Josh Swamidass
Associate Professor
MD/PhD, University of California, Irvine
Pathology & Immunology; Biomedical Engineering

Yuan-Chuan Tai (https://www.mir.wustl.edu/employees/yuan-chuan-tai/)
Associate Professor
PhD, University of California, Los Angeles
Radiology; Biomedical Engineering

Daniel Thorek
Associate Professor
PhD, University of Pennsylvania
Radiology; Biomedical Engineering

David Van Essen (https://profiles.wustl.edu/en/persons/david-van-essen/)
Alumni Endowed Professor
PhD, Harvard University
Neuroscience; Biomedical Engineering

Richard Wahl (https://wuphysicians.wustl.edu/for-patients/find-a-physician/richard-leo-wahl/)
Elizabeth E. Mallinckrodt Professor of Radiology
MD, Washington University
Radiology

Yong Wang (https://reproductivesciences.wustl.edu/people/yong-wang/)
Associate Professor
PhD, Washington University
Obstetrics & Gynecology; Radiology; Biomedical Engineering

Muriah Wheelock
Assistant Professor of Radiology
PhD, University of Alabama at Birmingham

Pam Woodard (https://www.mir.wustl.edu/employees/pamela-woodard/)
HM Wilson Professor of Radiology
MD, Duke University
Radiology; Biomedical Engineering

Lan Yang
Edwin H. & Florence G. Skinner Professor
PhD, California Institute of Technology
Electrical & Systems Engineering

Tiezhi Zhang (https://radonc.wustl.edu/faculty/tiezhi-zhang-phd/)
Associate Professor
PhD, University of Wisconsin-Madison
Radiation Oncology; Biomedical Engineering

Jie Zheng (https://www.mir.wustl.edu/employees/jie-zheng/)
Associate Professor
PhD, University of Cincinnati
Radiology; Biomedical Engineering

Chao Zhou (https://engineering.wustl.edu/faculty/Chao-Zhou.html)
Associate Professor
PhD, Physics, University of Pennsylvania
Biomedical Engineering

Quing Zhu (https://engineering.wustl.edu/faculty/Quing-Zhu.html)
Professor
PhD, University of Pennsylvania
Biomedical Engineering
Professor Emeritus

Newton R. and Sarah Louisa Glasgow Wilson Professor of Engineering
PhD, University of Pennsylvania
Electrical & Systems Engineering

Degree Requirements

• PhD in Imaging Science (http://bulletin.wustl.edu/grad/engineering/imaging-science/phd-imaging-science/)
• Master of Science (MS) in Imaging Science (http://bulletin.wustl.edu/grad/engineering/imaging-science/ms-imaging-science/)

Courses

For information regarding courses, please refer to the Degree Requirements (p. 4) section of this page.