

MARQUETTE UNIVERSITY
**GRADUATE PROGRAMS IN
DATA SCIENCE AND
ENGINEERING**

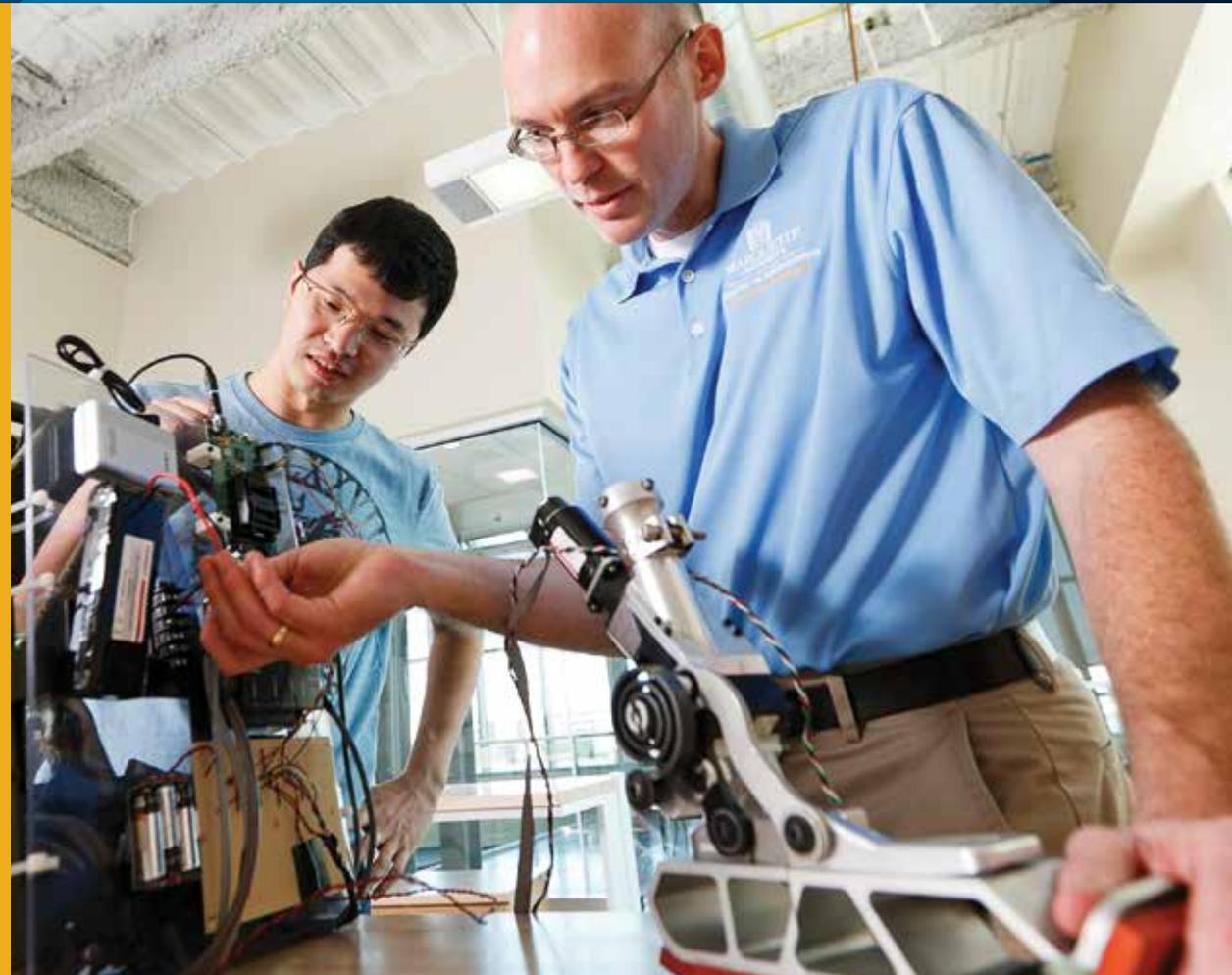


**BE THE
DIFFERENCE.**

Graduate School

1324 W. Wisconsin Ave.
Milwaukee, WI 53233
414.288.7137
marquette.edu/grad

 [MUGradSchool](#)
 [MarquetteGradSchool](#)



"Our students are being trained in an innovative way that's very relevant right now."

DR. GARY KRENZ

Director of Graduate Studies
Computational Sciences

DATA SCIENCE AND ENGINEERING PROGRAMS

Applied Statistics 2

Bioinformatics 2

Computational Sciences 2

Computing 2

- Big Data and Data Analytics
- Computing Career Change Opportunity
- Information Assurance and Cyber Defense

Data Science 3

Health Care Data Analytics 3

Biomedical Engineering 6

- Bioinstrumentation/Computers
- Biomechanics/Biomaterials
- Rehabilitation Bioengineering
- Systems Physiology

Civil, Construction and Environmental Engineering 6

- Construction Engineering
- Environmental and Water Resources Engineering
- Structural Engineering and Structural Mechanics
- Transportation Engineering and Materials

Electrical and Computer Engineering 7

Mechanical Engineering 8

- Energy Systems
- Manufacturing and Materials Systems
- Mechanical Systems

Health Care Technologies Management 8

INQUIRY THAT ACCELERATES CHANGE FOR THE BETTER.

Data Science and Engineering programs at the Marquette University Graduate School

Through your studies at the Marquette University Graduate School, you will gain the breadth and depth of experience and knowledge to accelerate your career potential. And although that's important, your education here will extend well beyond that. You'll be challenged to work at a higher level than you ever have. You'll be asked to think deeply about the social and ethical implications of your work. And you'll understand how your insights can be applied outside a research setting to address the world's most compelling needs. And you'll be ready to Be The Difference.

Gain the interdisciplinary skills that are critical for today's scientists. From seamless partnerships between university departments to collaborations with Milwaukee-area organizations, government agencies, and fellow institutions of higher education, interdisciplinary learning is built into every program.

Follow your career path. A Marquette graduate degree gives you options. You'll be prepared to further your graduate studies with another advanced degree or to work in the private or public sector, in industry, research or academia. And being in Milwaukee will provide networking opportunities while you're in school, and job opportunities after you graduate.

Work side by side with top faculty. Professionals come to work at Marquette because they have a genuine passion for seeing students grow and succeed. Our faculty value teaching as much as they value their research.

DATA WITH A CONSCIENCE.

Programs in Statistics and Computer Science

APPLIED STATISTICS: M.S.

Learn to work with big data, perform statistical analysis to detect hidden patterns in data, perform risk factor analysis and perform predictive analysis.

Potential careers: statistical analyst, applied statistician, research analyst



DR. SHION GUHA

Assistant Professor
Mathematics, Statistics and Computer Science

Guha studies the social and ethical implications of the massive amounts of data and algorithms that influence so many parts of our lives. His lab is taking a close look at Milwaukee crime data to determine how the information can best be used to keep the city more secure.

BIOINFORMATICS: M.S.

Learn to develop and improve methods and software tools for storing, retrieving, organizing and analyzing biological data to extract new biological knowledge. This program is offered jointly with the Medical College of Wisconsin.

Potential careers: pharmaceutical industry lab researcher, researcher in a medical academic setting, software developer

COMPUTATIONAL SCIENCES: M.S., PH.D.

Learn to implement, simulate and apply models to solve scientific and engineering problems.

Potential careers: research scientist, data scientist, professor

COMPUTING: M.S.

Deepen your knowledge of and skill in computer science, computer engineering, software engineering, information systems and information technology. And if you hold a non-computing undergraduate degree, our participation in the COSMIC project (Career Change Opportunity, Start MS in Computing) will prepare you for success as a computing master's student.

SPECIALIZATIONS:

- Big Data and Data Analytics
- Computing Career Change Opportunity
- Information Assurance and Cyber Defense

Potential careers: business intelligence analyst, information security architect, software engineer

DR. SERDAR BOZDAG

Assistant Professor
Mathematics, Statistics and Computer Science

Blending experience in computer science with a knowledge of oncology, Bozdag analyzes data from cancer patients to help doctors and other researchers find more effective ways to treat the disease.



DATA SCIENCE: CERTIFICATE

Learn to identify and articulate problems, issues and decisions that can be informed by data analytics approaches, and design and implement advanced strategies for analyzing big data. This program is also offered online.

Potential careers: computer and information systems manager, computer and information research scientist, business intelligence analyst

HEALTH CARE DATA ANALYTICS: M.S.

Learn to bring cutting-edge health care findings and practices together with the tools of analysis and technology to improve lives. This program is also offered online.

Potential careers: health care data analyst, health analytics consultant, data scientist

Northwestern Mutual Data Science Institute:

A partnership between Marquette, Northwestern Mutual and University of Wisconsin–Milwaukee, the institute advances data science education, offers experiential learning opportunities and connects area employers with data science talent.



"Not only do you have so many great teachers who are friendly and willing to help here at Marquette, you also

have access to the Medical College of Wisconsin and UW–Milwaukee."

DREW WILLIAMS

Doctoral Student in Computational Sciences
From: USA
Research focus: Data user experience

COMPUTING LABS

Computational Social Science Lab: focuses on understanding complex social phenomena through a human-centered, computational perspective

Database Lab: conducts research in both theoretical and system aspects of databases that affect practical areas such as information systems, health care, bioinformatics and others

Parallel Computing Lab: focuses on using Parallel and High Performance Computing to solve computer- and data-intensive problems

Systems Lab: creates new tools and methods for building and studying complex computer systems

Ubicomp Lab: focuses on the research issues in pervasive/ubiquitous computing systems and applications

Semigroup Theory Group: centers on the role of restriction semigroups, within semigroup theory itself and as connected with topics in language theory

Computational Algebra Lab: conducts research that offers a rare crossover between pure mathematics and computation

GasDay Lab: conducts research in system identification, time series signal processing, filtering, mathematical and statistical modeling, data mining, and forecasting

Electrical Impedance Tomography Lab: studies the use of electrical impedance tomography (EIT), a noninvasive, portable, radiation-free imaging modality to monitor heart and lung function and other internal structures and systems

Bioinformatics Lab: applies machine learning and algorithmic techniques to build models of gene regulation from high-throughput biomedical datasets in tumor cells

Office of Statistical Consulting and Training: develops and applies new statistical methods in a variety of applications

Functional Magnetic Resonance Image Analysis: works toward a unified mathematical model for functional magnetic resonance imaging (fMRI)



◀ DR. SARAH HAMILTON

Assistant Professor
Mathematics, Statistics and
Computer Science

Hamilton uses nonlinear inversion methods to enhance medical imaging through electrical impedance tomography. The algorithms she creates help the imaging technology account for variables in the body and result in a more reliable and accurate image.



"The opportunities here are great. I've worked in an excellent lab on an NIH-funded project, and published and presented my work at a variety of conferences."

MD. KAMRUL HASAN

Doctoral Student in Computational Sciences
From: Bangladesh
Research focus: Biomarker estimation

RESEARCH FOR A GREATER PURPOSE.

Programs in Engineering

BIOMEDICAL ENGINEERING: M.E., M.S., PH.D.

Learn to apply engineering and mathematics to the solution of problems related to medicine and biology. This program is offered in collaboration with the Medical College of Wisconsin.

SPECIALIZATIONS:

- Bioinstrumentation/Computers
- Biomechanics/Biomaterials
- Rehabilitation Bioengineering
- Systems Physiology

Potential careers: medical device designer, medical device researcher and developer, medical device regulatory positions

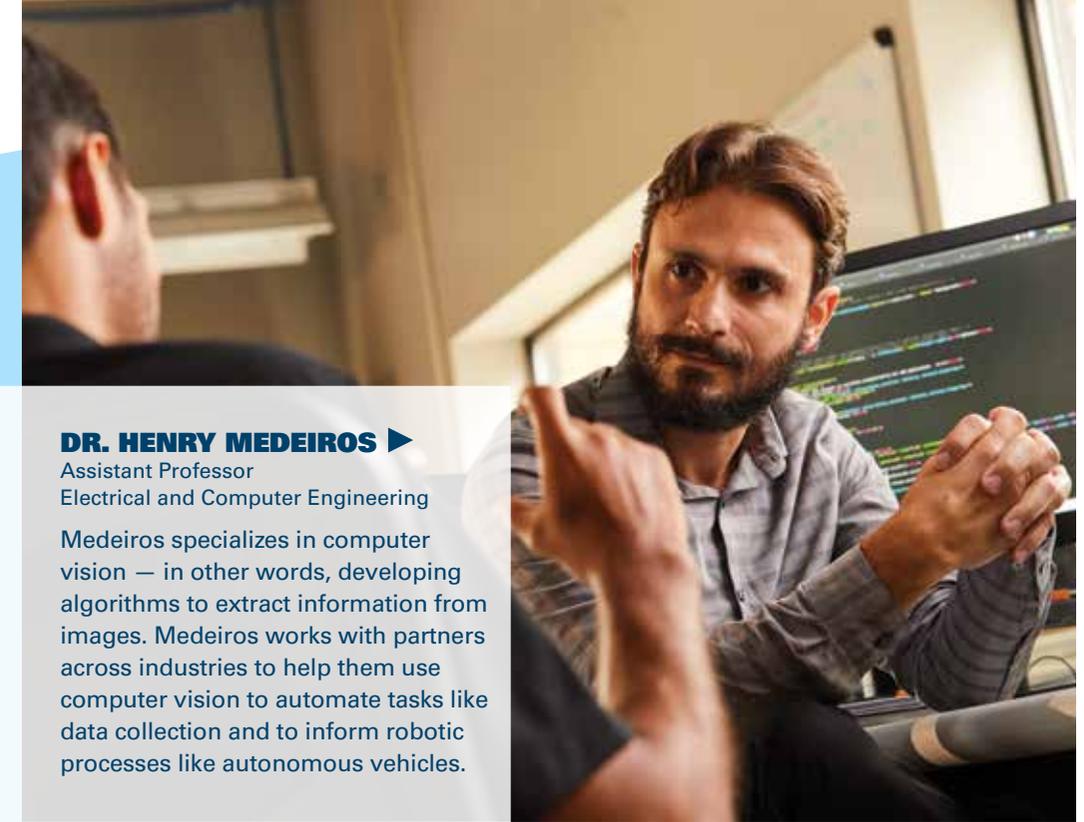
CIVIL, CONSTRUCTION AND ENVIRONMENTAL ENGINEERING: M.S., PH.D.

Deepen your fundamental knowledge in civil engineering, and learn current and emerging applicable technologies.

SPECIALIZATIONS:

- Construction Engineering
- Environmental and Water Resources Engineering
- Structural Engineering and Structural Mechanics
- Transportation Engineering and Materials

Potential careers: civil engineer, environmental engineer, construction engineer, structural engineer, water resource engineer



DR. HENRY MEDEIROS ►

Assistant Professor
Electrical and Computer Engineering

Medeiros specializes in computer vision — in other words, developing algorithms to extract information from images. Medeiros works with partners across industries to help them use computer vision to automate tasks like data collection and to inform robotic processes like autonomous vehicles.



► DR. TALY GILAT-SCHMIDT (far right)

Associate Professor
Biomedical Engineering

Gilat-Schmidt develops technologies to improve medical imaging. By making medical equipment safer, patients' exposure to radiation is reduced. And, by sharpening the quality of what doctors can see, diagnoses become more accurate and care is more efficient.

ELECTRICAL AND COMPUTER ENGINEERING: M.S., PH.D.

Build on fundamental knowledge with a focus in one or more of the following areas: signal processing, control theory, electromagnetic fields and waves, power and energy systems, solid state devices and sensor systems, or algorithms and machine learning.

Potential careers: electrical engineer, systems engineer, software engineer

"I like the environment here at Marquette. I'm trusted to explore the topics I want and have the freedom to come up with my own ideas."

WENKAI GUAN

Doctoral Student in Electrical and Computer Engineering
From: China
Research focus: Design for embedded systems under uncertainty

"Here, you have direct access to top-level facilities and faculty. You get one-on-one attention from experts in multiple disciplines."

SAMUEL AMOAKO-FRIMPONG

Master's Student in Electrical and Computer Engineering
From: Ghana
Research focus: Mobile robotics

MECHANICAL ENGINEERING:
M.E., M.S., PH.D.

Deepen your knowledge of the fundamentals of analysis, design, manufacture and improvement of machines.

SPECIALIZATIONS:

- Energy Systems
- Manufacturing and Materials Systems
- Mechanical Systems

Potential careers: product designer, manufacturing positions, machine designer, structural designer

HEALTH CARE TECHNOLOGIES MANAGEMENT: M.S.

Study the design, development, commercialization and regulatory compliance of diagnostic and therapeutic medical devices, and the implementation, use and assessment of hospital-based health care technologies. This program is offered jointly with the Medical College of Wisconsin.

Potential careers: directors or vice presidents of health systems, professionals in private health care companies or related organizations, biomedical engineers, system engineers

ENGINEERING LABS

Clay Lafferty Microsensor Research Laboratory: supports research in solid state and acoustic wave sensors, microelectromechanical systems devices and sensors, optical wave guide-based sensors and smart sensor systems

Falk Neurorehabilitation Engineering Research Laboratory: focuses on activities related to helping patients recover from nervous system injuries and conducts research in the areas of motion, force, muscle stimulation and more

Fotsch Family Machine Design Laboratory: allows exploration with hardware and real-world systems

Orthopaedic and Rehabilitation Engineering Center: a collaboration between Marquette University and the Medical College of Wisconsin, with successes in orthopaedic biomechanics, biomaterials, rehabilitation engineering and human motion analysis

Thermofluid Science and Energy Applications Laboratory: focuses on practical application and integration of thermofluid science fundamental knowledge

MARquette Visualization Lab (MARVL): demonstrates how visualization technology can be used in learning, research and industry

Water Equipment and Policy Center: a partnership with several organizations, including manufacturers, public utilities and government agencies, that focuses on creating the next generation of products and processes to advance the water industry

Water Quality Center: brings together researchers, industries, government agencies, private foundations and others to solve problems related to lake, river and groundwater quality



DR. JAY GOLDBERG

Director, Health Care Technologies Management Program
Clinical Professor
Biomedical Engineering

As the director of the Health Care Technologies Management program, Goldberg draws on his extensive background working in the medical device industry to share specific insights on managing the product development process with students, and to ensure the program prepares students to launch (or advance) thriving careers in the field.



DR. BROOKE MAYER (standing)

Associate Professor
Civil, Construction and Environmental Engineering

Mayer evaluates all aspects of drinking water quality and treatment — and seeks ways to improve it. And because water affects everything on earth, her work has far-reaching implications for the environment and all the lives that depend on it.

MARQUETTE UNIVERSITY

WHO WE ARE

We serve something greater than ourselves.
Excellence. Faith. Leadership. Service.

These four words form the foundation of our mission and guide every decision we make. You'll hear them often and see them in action every day.

3,000+

GRAD/PROFESSIONAL STUDENTS

53%

WOMEN

47%

MEN

69%

FULL-TIME

31%

PART-TIME

STUDENTS COME FROM

**47 STATES &
32 COUNTRIES**



OUR HOMETOWN:

MILWAUKEE.

From cutting-edge facilities to the vast opportunities in the city of Milwaukee, we surround ourselves with the ideal elements to enhance our work and our lives.

Milwaukee grants us access to partners that amplify our work. Some of those initiatives include:

ACCELERATING WATER SOLUTIONS

In early 2016, Marquette moved into the Global Water Center in Walker's Point where our faculty, staff and students are now advancing 13 projects in areas such as wastewater treatment, desalination and water law. Partners include Zurn, A.O. Smith Corp. and the Milwaukee Metropolitan Sewerage District.

ADVANCING BIOMEDICAL INNOVATION

We collaborate with the Medical College of Wisconsin to bring students the next generation of medical devices and health care technologies to help diagnose and treat medical problems.

RENEWING THE NEAR WEST SIDE

It began with a conversation between Marquette and Harley-Davidson and grew from there. Corporations, institutions and neighbors united to create the Near West Side Partners Inc., a collaborative model of community redevelopment.

1.5M
PEOPLE IN MILWAUKEE

ONE OF THE TOP
U.S. CITIES BY
POPULATION

FIND PROFESSIONAL SPORTS, RESTAURANTS, SHOPPING, ARTS, 15,000 ACRES OF PARKS AND ALL THE BIG-CITY AMENITIES YOU WANT.

visitmilwaukee.org

NEXT STEPS.

If you want to learn more about earning your degree at the Marquette University Graduate School, we'd love to talk with you. Connect with a graduate program recruiter, or reach out to a faculty member by phone or email. Or, make plans to visit us on campus. You'll also want to review the program requirements, as well as application and financial aid deadlines.

APPLICATION PROCESS

APPLY ONLINE.

You can find a detailed description of everything you'll need to do to apply, including requirements and deadlines, at marquette.edu/grad/apply. Here are the basic steps:

Submit your admissions application at **graduate.admissions.marquette.edu/apply**.

Request your transcripts from the colleges you attended. Unofficial transcripts can be uploaded at the time of application.

Ask former professors and employers for letters of recommendation.

Take standardized tests (if required) early. Submit official scores. Score reporting can take up to six weeks from exam date.

Draft your statement of purpose.

Put together your academic resume, if required.

International students submit official TOEFL or IELTS exam scores or other acceptable proof of English proficiency.

Review your online application checklist to ensure it is complete.

Business card slits

