

BME Crossroads:

Innovative Small Steps leading to Giant Leaps



Where medicine met meaning:
A heart exposed, a future engineered.



Weldon School of
Biomedical Engineering

West Lafayette & Indianapolis

Contents

- 03 - A message from the Weldon School Head**
- 04 - Weldon School celebrates 50 years**
- 06 - 150 years of Purdue Engineering**
- 07 - Weldon School: Serene, Sturdy and Strategic**
- 08 - Cook and BME: A Legacy of Healing**
- 09 - Expansion to Indianapolis**
- 10 - Engineering in Medicine**
- 11 - Student Success with Stroke Treatment**
- 12 - A Heart Exposed, a Future Engineered**
- 15 - Innovating for Children's Health**
- 16 - New Courses, New Research**
- 17 - From Purdue to Medtronic's Highest Honor**
- 18 - Celebrating Our Alumni Successes**
- 19 - Meet Our Advisory Board**
- 20 - 'More than just an image'**
- 21 - BME Professional Master's Program**
- 22 - Meet the Weldon Faculty**



STAY UP TO DATE!



PurdueBME
WeldonSchool
PurdueBME
WeldonSchool

A publication of the Weldon School
of Biomedical Engineering at
Purdue University

Fall 2025

Dane A. Miller Head and Professor
of Biomedical Engineering

Kevin Otto

Executive Editor in Chief and
Senior Marketing and
Communications Manager

Rhonda Jones

Creative Designer and Lead

Eryn Mangun



Kevin Otto

Dane A. Miller Head and Professor
of Biomedical Engineering

MESSAGE FROM THE HEAD

Dear Friends of the Weldon School,

Indiana is known as the Crossroads of America. At the Weldon School of Biomedical Engineering, we stand at our own crossroads—where discovery converges with dedication and innovation is driven by a singular mission: to improve health and transform lives.

Since the founding of Biomedical Engineering at Purdue in 1974, Boilermakers have advanced technologies that have touched more than 100 million patients worldwide. That legacy is accelerating. In 2024–2025, our undergraduate class-size grew by an extraordinary 40% and our sponsored research expanded by 47%—a testament to the talent, ambition and vision of our community.

We are building at the heart of Indiana's life sciences ecosystem. With the state recognized as the nation's #1 life sciences exporter and our new presence alongside the Indianapolis medical center, the Weldon School is poised to shape the future of healthcare in ways that once seemed unimaginable.

This inaugural issue reflects that spirit—highlighting senior design projects with profound impact and showcasing the relentless pursuit of innovation that defines Purdue BME. At this BME Crossroads, we are not only rising to today's challenges—we are charting the future of health.

Hail Purdue!

Remembering friends and family of the Weldon School

Gayle Cook

March 1, 1934 - August 17, 2025



We are saddened by the passing of Gayle Cook, co-founder of Cook Incorporated, which grew into the Cook Group. Her visionary leadership helped shape the medical device industry and improve countless lives. Cook Medical has been a longtime and valued partner of the Weldon School and we honor her legacy with deep gratitude. Her impact endures in the innovations she inspired and the lives she touched.



Robert Hannemann

August 8, 1930 - February 20, 2025



We are deeply saddened by the passing of Dr. Robert Hannemann, a cherished member of our Weldon School of Biomedical Engineering family. Dr. Hannemann's kindness, dedication and impact on our students and community were immeasurable. His legacy will live on through the countless lives he touched.



50 YEARS IN THE MAKING

Engineering the Next Giant Leap in BME

1974

- William Hillenbrand donates \$500,000 to establish biomedical engineering research at Purdue.
- Leslie Geddes, Joe Bourland, Willis Tacker and Charlie Babbs create the Biomedical Engineering Center.
- Leslie Geddes named Director of Biomedical Engineering Center and Showalter Distinguished Professor.



1987

- Leslie Geddes creates the Geddes-Laufman-Greatbatch Graduate Student Award for productivity and service.

1998

- The Department of Biomedical Engineering is formed
- George Wodicka named founding head.

2004

- Recognizing the generosity of the Weldon Family, the school is renamed "The Weldon School of Biomedical Engineering," becoming the first named school in the College of Engineering at Purdue.

2006

- The new home of the Weldon School is dedicated.
- Cook Group, Inc. endows Leslie A. Geddes Professorship.
- Leslie Geddes receives the National Medal of Technology in White House ceremony.

2007

- Inaugural biomedical engineering undergraduate class graduates.

2008

- NIH Clinical and Translational Science Institute (CTSI) grant with Indiana University School of Medicine awarded.
- MD/PhD Program receives NIH Medical Scientist Training Program (MSTP) funding.
- The new building is formally renamed the Martin C. Jischke Hall of Biomedical Engineering.



THE WELDON SCHOOL OF BIOMEDICAL ENGINEERING



- 28% increase in undergraduate class size results in >600 undergraduate enrollment.
- Sponsored research expenditures exceed \$20M, representing 47% annual growth.



- Indianapolis location established, triggering explosive enrollment and research growth.
- BME at Purdue turns 50!

2024

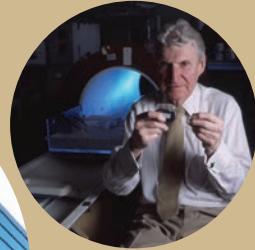
2025

2019

- Biomedical Engineering cumulative licensing revenues exceed \$30M.
- Purdue College of Engineering and Indiana University School of Medicine announce major Engineering/Medicine Partnership.

- Construction begins for Innovation Wing of the Martin C. Jischke Hall of Biomedical Engineering.

2018



2016

- Center for Implantable Devices formed.
- Purdue chapter of Alpha Eta Mu Beta, the biomedical engineering honor society, created.
- Internship program at National University of Ireland-Galway initiated.
- Online Professional Master's degree program launched.

- Orthopedics pioneer, Dane and Mary Louise Miller endow headship.
- George Wodicka appointed inaugural Dane A. Miller Head of Biomedical Engineering.

2014

- Federal and foundational research funding doubles over the past year.
- First of three Biomedical Engineering preeminent faculty teams selected for support by Purdue College of Engineering.
- Study abroad programs with ETH in Switzerland and DTI Denmark launched.

2010

2012

- 11 Biomedical Engineering faculty members elected to AIMBE College of Fellows.
- Active U.S. patents exceed 100, with 50 active corporate licenses.
- Biomedical Engineering cumulative licensing revenues exceed \$20M.

150 Years of Purdue Engineering:

From One Student to the Stars and Beyond

In September 1874, Purdue welcomed its first engineering student, William Eldridge, into a civil and mechanical engineering course taught by William Morgan. No one could have predicted that this small beginning would grow into one of the world's most influential engineering colleges — a place where Boilermakers would tackle humanity's greatest challenges.

From the first steps on the moon to the span of the Golden Gate Bridge, Purdue engineers have been at the heart of history. Neil Armstrong (BSAE'55'55) and Eugene Cernan (BSEE'56) bookended the Apollo era as the first and most recent people to set foot on the lunar surface. Charles Ellis helped design San Francisco's iconic bridge. Maurice Zucrow (PhD ME'28) returned to Purdue to build the propulsion laboratory that still powers aerospace breakthroughs today.

The legacy continues in surprising ways. Martin Atalla (MSME'47, PhD ME'49) co-invented the MOSFET, the tiny transistor that makes modern electronics possible. The MOSFET (Metal-Oxide-Semiconductor Field-Effect Transistor) is widely considered the most produced human-made item in history. Frank Thomas Jr. (BSME'41) made life a little sweeter by inventing the soft-serve ice cream machine. Together, Boilermakers have advanced nearly every aspect of modern life.

And the story is far from over. Today, Purdue engineers are driving bold new frontiers — leading in hypersonics, AI, quantum computing, energy transition and engineering in medicine. Purdue's pioneering semiconductor programs and global partnerships helped bring a \$4 billion SK hynix facility to the Purdue Research Park, placing Boilermakers at the center of the world's technological future.

Just as Armstrong and Cernan never came to Purdue to be astronauts — an occupation that didn't exist when they enrolled — tomorrow's students will invent paths we cannot yet imagine. For 150 years, Purdue Engineering has prepared dreamers to become doers. And the next 150 promises to be just as extraordinary.

Leslie Geddes — *Founding Father of Purdue BME*

Leslie A. Geddes, the Showalter Distinguished Professor of Biomedical Engineering, arrived at Purdue in 1974 with a mission: to establish biomedical engineering as a thriving research discipline. That same year, he became the founding director of the Hillenbrand Biomedical Engineering Center.

A trailblazing electrical engineer and physiologist, Geddes:

- Identified the best chest locations for defibrillation and pacing.
- Secured 30+ patents for life-saving heart and lung treatments.
- Invented devices ranging from the first clinical EMG to a baby pacifier that delivers medicine.
- Created innovations used by NASA, surgeons worldwide and medical companies like Cook Biotech, DePuy and Eli Lilly.
- Generated tens of millions in royalties for Purdue, fueling further research.

His 50-year career trained generations of biomedical engineers and earned the nation's highest honors in technology and engineering — including the National Medal of Technology and Innovation (2006), the IEEE Edison Medal (1994) and induction into the National Academy of Engineering (1985).

Leslie Geddes' legacy continues to define the Weldon School of Biomedical Engineering and the field itself.



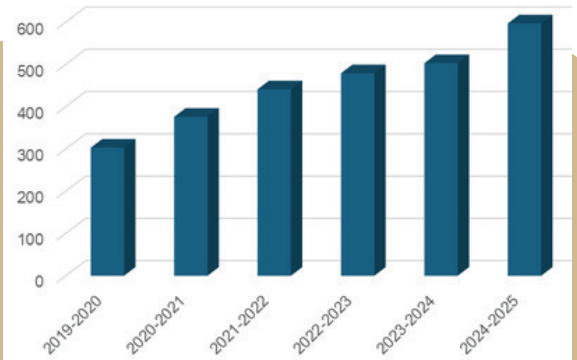
SERENE, STURDY AND STRATEGIC

THE WELDON SCHOOL IS LEADING WITH PURPOSE IN UNCERTAIN TIMES

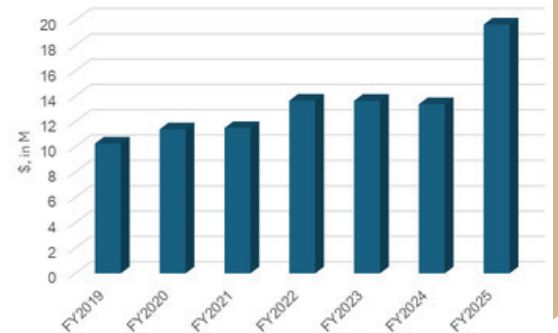
Our “Now”

- **Excellence at scale** – In Fall 2024, the Weldon School welcomed its largest undergraduate class, a 40% class-size enrollment increase, surpassing 600 total students.
- **Research on the Rise** – Sponsored research expenditures grew 47% in FY25, reaching nearly \$20 million.
- **National Recognition** – Nestled within Purdue’s College of Engineering (#1 Producer of Engineers, #5 Graduate and #8 Undergraduate), the Weldon School climbed to its best rankings since 2019 (#24 Graduate and #23 Undergraduate) - *U.S. News & World Report*.
- **Indiana Life Sciences Leadership** – Indiana leads the nation in life sciences exports at \$27 billion (2024), surpassing California - *BioCrossroads*.

Weldon School Undergraduate Enrollment



Weldon School Research Expenditures



Our Future

- In lockstep with Purdue’s College of Engineering, we aim to be the most consequential BME program in the world by 2030.

How We’ll Get There

- **Educating at Scale** – Becoming the world’s largest producer of the best-prepared undergraduate BMEs. We will continually strive for our mission of Access, Affordability and Belonging.
- **We Maximize Value:**
 - Through strategic opportunities and growth in Indy, **Access** is at an all-time high.
 - 14 years of frozen tuition—proof that **Affordability** isn’t just a promise, it’s our foundation
 - **Belonging** matters here. Purdue University ranks #2 out of 257 schools in the 2026 College Free Speech Rankings - *Foundation for Individual Rights and Expression*.

We offer unmatched value — and we are committed to the persistent pursuit of excellence.
- People, place, and purpose align at Weldon BME—watch us take our next Giant Leap.

COOK AND PURDUE BME: A LEGACY OF HEALING

More than 100 Million Lives Transformed Through Innovation



For over 50 years, Cook Medical and Purdue University's Weldon School of Biomedical Engineering have partnered to unite education, research and industry in service of patients. Today, that collaboration is stronger than ever—building on its rich foundation to drive the next generation of medical breakthroughs.

Preparing the Next Generation

Cook experts continue to bring real-world experience into Purdue BME classrooms, teaching courses in clinical studies, regulatory science, medical device safety and senior design. Their mentorship ensures students gain both technical knowledge and the perspective needed to navigate an evolving healthcare landscape. With FDA staff and industry leaders joining in, Purdue students learn in an environment that mirrors the global challenges and opportunities of medical technology.

Building Careers with Impact

The partnership creates a seamless pipeline from classroom to career. Cook employs more Purdue BME alumni than nearly any other partner, with more than 100 Purdue degrees represented in the West Lafayette-based Cook companies and more employed at other Cook Medical locations. Year-long co-ops and internships give students deep, hands-on experience, while many alumni return to campus as faculty, mentors and collaborators. This cycle keeps innovation flowing in both directions.

Driving Tomorrow's Breakthroughs

Collaborative testing and research between Cook and Purdue BME continue to deliver results that shape the future of medicine. From pioneering cardiovascular stents to tissue-engineered graft products, their shared work has touched hundreds of millions of lives. Now, with state-of-the-art facilities like the MJIS Innovation Wing and expanded collaborations through MED Institute, Cook and Purdue are accelerating product development not just for Cook, but for innovators across the MedTech industry.

Expanding the Horizon

The partnership is increasingly focused on unmet needs and emerging frontiers. Through the Crossroads Pediatric Device Consortium, Purdue, IU School of Medicine and Cook are creating life-saving devices for children. New collaborations are extending into areas such as AI, robotics, interventional MRI and data-driven healthcare. With every project, the aim is the same: practical, clinically relevant solutions that make a difference for patients.

Looking Ahead

As Purdue BME marks more than 50 years and Cook continues to expand its global reach, the partnership is poised to grow in both scale and impact. Together, these two institutions are proving that when academia and industry align around patient benefit, the possibilities for innovation are endless.



Neal Fearnot

Purdue alumnus Neal Fearnot, former president of MED Institute and Cook Advanced Technologies credits his success to lessons learned at Purdue, emphasizing the importance of clear communication and lifelong learning. He attributes his ability to lead teams through high-stakes FDA reviews to the skills he developed there. Fearnot valued connecting with people from diverse backgrounds and the qualities of a good leader such as building up your team and taking the blame when things go wrong. To inspire future students he established the Fearnot-Laufman-Greatbatch Award, which recognizes the most outstanding presentation in the Summer Seminar Series.

INDIANAPOLIS



Purdue University's upcoming Academic Success Building (ASB) in Indianapolis is set to significantly enhance student experiences by offering state-of-the-art facilities and fostering a close-knit community. Among the students anticipating its benefits is first-year BME student Aurelia Chelfannisa.

Originally from Singapore, Aurelia chose Purdue for its renowned engineering program and the vibrant city environment of Indianapolis which reminds her of home. She is currently involved in research with her professor and is enthusiastic about the ASB's potential to expand student research opportunities. The 248,000 square foot 15 floor mixed use facility will feature housing and dining for students.

Aurelia believes that the ASB will serve as a central hub for students to collaborate on group projects and build a supportive community. She notes, "This building will be a Purdue campus center to hang out and meet up for group projects. Campus living also helped me feel welcome. This new addition will help a lot of students adjust to campus life."

Set to open in May 2027, the ASB exemplifies Purdue's commitment to providing students with cutting-edge resources and fostering an environment conducive to both academic and personal growth.

Scan this QR code to watch a video about
Biomedical Engineering in Indianapolis:



ENGINEERING IN MEDICINE

As medicine becomes increasingly precise and data-driven, engineering is growing ever more critical in solving the world's pressing healthcare problems. The need and potential for life-changing medical diagnostics and treatment devices have never been greater. But developing optimal approaches and translating lab discoveries into real-world solutions can pose challenges - unless key stakeholders work together.

To accelerate breakthroughs at the intersection of engineering and medicine, Purdue University's initiatives connecting engineering and medicine are driving powerful collaboration among engineers, clinicians and life sciences companies. Partners in the initiative's ecosystem include Indiana University School of Medicine and medical device company Cook Medical, both of which, along with Purdue, form the Crossroads Pediatric Device Consortium.

We combine our engineers' problem-solving skills and research prowess with the unique perspectives and talents of professionals who directly understand patient, provider and market needs. Academic and industry partnerships also underpin innovative cross-disciplinary education programs that prepare the future workforce for closer engineering-medicine integration. Robust academic, clinical and industrial ties foster experiential learning and thriving technology development and implementation.



Craig Goergen

Associate Head for Clinical Engagement
Professor of Biomedical Engineering
Adjunct Professor of Surgery, IUSM



“Engineers and clinicians make excellent partners when working to solve unmet needs and improve patient care”

Research Areas



Pediatric
Medicine



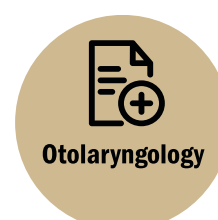
Cardiovascular
Health



Cancer Diagnosis
& Treatment



Musculoskeletal
Health

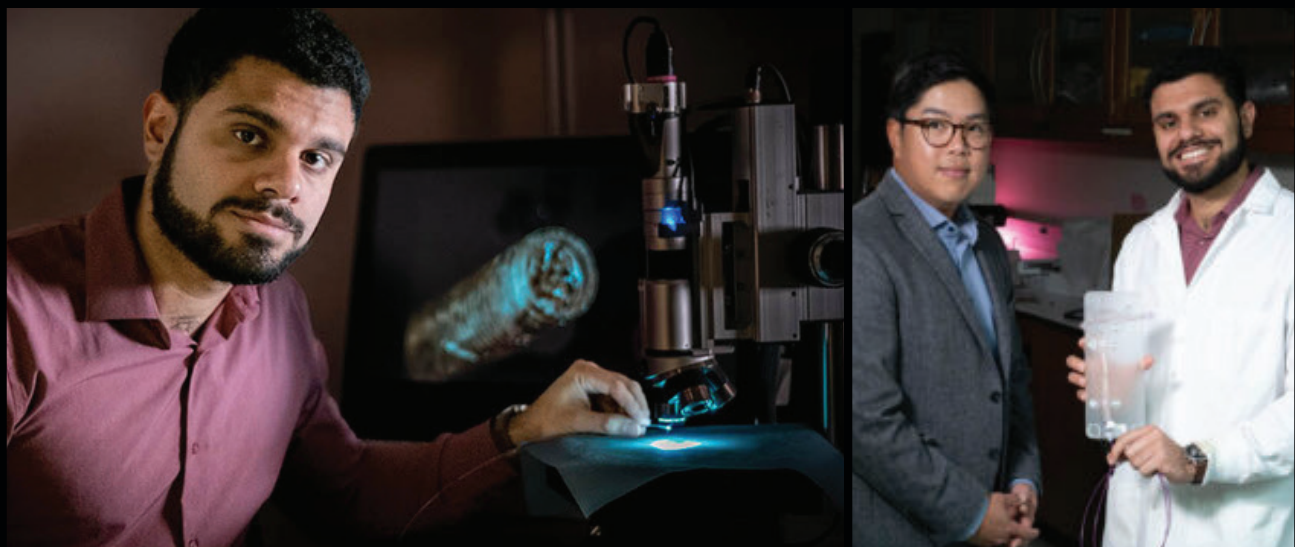


Otolaryngology



Neuro Medicine

EMBOA



Emboa Medical advances stroke treatment with Purdue-engineered TRAP catheter

Emboa Medical Inc., a medical device startup, has mimicked a snake's evolutionary advantage to improve the retrieval of blood clots that cause stroke.

The company has created a novel microstructured catheter that has been validated to improve outcomes for stroke patients. Its patent-pending platform, called TRAP, or Thrombus Retrieval Aspiration Platform, emulates a boa constrictor's teeth arrangement in its biomimetic design to grab onto blood clots without tearing them.

CEO Ángel Enríquez of Emboa Medical said the TRAP design demonstrated a greater than 200% increase in blockage removal force compared to a traditional catheter.

"Additionally, the TRAP catheter showed significant benefits in removing clots on the first attempt in a worst-case neurovascular model," he said. "It achieved a 40% success rate compared to 10% for conventional smooth inner diameter catheters."

Emboa Medical was founded by clinical experts at Goodman Campbell Brain and Spine and NYU Langone Health and medical device researchers at Purdue University's College of Engineering. TRAP was designed by Enríquez and Hyowon Lee, professor in Purdue's Weldon School of Biomedical Engineering and director of the Center for Implantable Devices. They disclosed TRAP to the Purdue Innovates Office of Technology Commercialization, which submitted a patent application to protect the intellectual property. OTC also issued a license to Emboa Medical to commercialize the IP.

Stroke is the second-leading cause of death worldwide; it kills about 140,000 Americans annually. Almost 90% of stroke cases are caused by an obstruction of one of the arteries that supply blood to the brain, known as an ischemic stroke.

Enríquez said stroke is an extremely time-sensitive condition that requires swift therapy for a patient's full functional recovery.

Read more about EMBOA on our website:



A Shell for Faith

How a team of BME students, physicians and engineers built hope—one prototype at a time.

Faith was born with her heart outside her chest.

At just 21, she's already survived what most never do. Diagnosed in utero with Pentalogy of Cantrell, a rare and often fatal condition involving five major defects—including the absence of a sternum—Faith's early prognosis was grim.

For the first six months of her life, Faith was cared for at Riley Hospital for Children and spent the next five years at home on a ventilator. Her mother, a nurse, recalls the constant balancing act between safety and normalcy. With no bone to protect her heart, even a small fall could have devastating consequences.



“The doctors said I wouldn’t survive this condition, so I’m very blessed to be here today.” ~Faith

“It was a long journey of trying to find that space between being normal and being safe for her.”

Despite years of surgeries and make-do chest protectors, there was no device truly designed for Faith. That changed when Dr. Elle Geddes, a medical geneticist at Riley Hospital, met her.

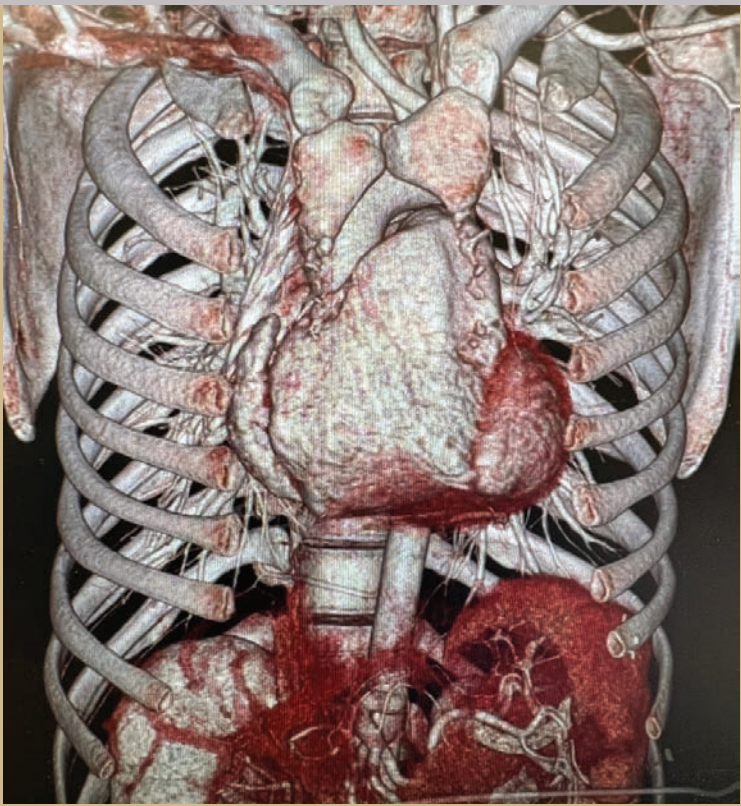
“She came to me to see if we could determine why she was born with Pentalogy of Cantrell. I asked if she had a chest shield. She did, but when I realized how it sat and what it was made of, I thought: this isn’t enough. She deserves better.”

Geddes reached out to Dr. Brian Gray, a pediatric surgeon with a reputation for creative solutions. Together, they began exploring possibilities—but it was a group of Purdue University Biomedical Engineering students who would bring Faith the protection she needed.

A Capstone with Heart

Each year, seniors in Purdue’s Weldon School of Biomedical Engineering in Indianapolis complete a capstone project—real-world problems guided by clinical mentors. Students Kayla Kielbasa, Josh Sprunger and Claire Marotta were introduced to Faith’s case through a pitch video.

“It was the most unique of all the projects,” said Kielbasa. “It wasn’t some abstract process—it was this one person. And we all got a little emotionally attached to Faith.”



They researched the biology, analyzed the risks and began developing a custom chest shield. Using Autodesk 360, they modeled and iterated their design through 3D printing, overcoming challenges of fit, flexibility and comfort. But as students, they couldn't deliver the final, wearable medical-grade product.

"All I wanted was for Faith to have what she needed. When we heard Purdue was picking it up, I was so excited. It meant everything," shared Marotta.

From Prototype to Protection

Enter the Crossroads Pediatric Device Consortium of industry partners—including OrthoPediatrics—who took the student team's design and refined it. Working with Faith's family, they brought the turtle shell to life.

Yes, turtle shell. That's what Faith named it.

"A lot of engineering programs came up with great ideas that never see the light of day. Purdue didn't wait. They knew Faith needed this and moved fast." ~OrthoPediatrics



"It goes around me like in a circle, front and back, so it looks like a turtle shell—because it's protecting me on the inside."

In just 45 days, the finalized device was in Faith's hands. She and her family went out to dinner to celebrate the milestone they never thought they'd see.

"When we left her for her freshman year of college, I bawled my eyes out. Seeing her graduate, walking across that stage, protected, proud—that was everything," shared her father.

Faith is now heading to graduate school to become a speech therapist. With her turtle shell, she can drive, go to the grocery store and live a young adult's life with a little more confidence.

"This is a priceless item to us—to allow her that freedom and independence."



A Model for the Future

The collaboration stands as a testament to what's possible when ingenuity meets compassion. Purdue BME students didn't just meet an academic requirement—they changed someone's life.

The effort has become a shining example of what partnerships between academia, medicine and industry can achieve. The hope is to replicate this model for other patients with rare or complex conditions.

"A lot of engineering programs come up with great ideas that never see the light of day. Purdue didn't wait. They knew Faith needed this and moved fast," shared Joe Hauser, President of Trauma, Deformity and OPSB at OrthoPediatrics.

Dr. Geddes reflects on the journey with emotion.

"I feel a maternal sort of pride in Faith—even though I've only known her a few years. This device helps me sleep better at night, knowing she's as safe as we can make her."

For Faith, it means something simpler: freedom, safety and a future. "I'm so thankful for every single person who contributed to this project and came together to create this for me. I can't say thank you enough."



Watch Faith's story:



The stories of Purdue engineering for one-and-a-half centuries are the stories of hundreds of thousands of engineering alumni, the stories of world-class discovery of knowledge and transformational problem-solving impact, the stories of intellectual pursuit of the highest caliber by our faculty."

MUNG CHIANG

President, Purdue University



Crossroads Pediatric Device Consortium:

Innovating for Children's Health



For decades, children have waited years for the same medical advances available to adults. Many pediatricians are still forced to adapt adult-sized devices to treat their youngest patients—an imperfect solution that too often leaves children behind. The Crossroads Pediatric Device Consortium, a new alliance based in Indiana, is determined to change that.

Formed by Purdue University's Weldon School of Biomedical Engineering, the Indiana University School of Medicine Department of Pediatrics, Cook Medical and OrthoPediatrics, the consortium serves as a hub for innovation. By uniting world-class engineers, physicians and industry leaders, Crossroads is accelerating the development of safe, effective medical devices designed specifically for children.

The need could not be clearer. Eighty percent of FDA-approved medical devices have never been tested for pediatric use. Less than 12% of NIH funding goes to pediatric research. On average, just one new pediatric device earns FDA approval each year—despite more than 5,000 pediatric-only rare diseases affecting families across the country.

“Children are an underserved patient population in terms of new medical technologies,” said Matthew Waninger, PhD, the consortium's Managing Director. “Our goal is to encourage and help companies produce more pediatric medical devices. Through our combined engineering, clinical and manufacturing expertise, we can make a real difference.”

The consortium is designed to reduce the cost and risk of innovation by providing shared resources, funding opportunities and regulatory guidance. Most importantly, it fosters collaboration between clinicians, researchers and industry partners to ensure that promising new technologies reach children who need them.

“Pediatricians are often limited in their choices of available medical devices for treating these children who have medical needs distinct from adults,” Waninger said. “The Crossroads consortium seeks to catalyze collaboration... to quickly and successfully place promising new medical technologies into their hands.”

By accelerating the pace of innovation, Crossroads aims to close the gap in care and bring life-changing solutions to children faster than ever before.

Learn more about Crossroads Pediatric Device Consortium at: <https://pediatricdevices.org/>.

New Course Explores Pediatric Medical Devices

Purdue's Weldon School of Biomedical Engineering now offers Pediatric Medical Devices, a three-credit course taught by Professor George Wodicka. The class examines the unique medical needs of pediatric patients through pediatric device design, regulation, clinical studies and ethics, with subspecialties including neonatology, surgery and pulmonology. With a focus on unmet clinical needs, the course emphasizes translating innovations into life-saving solutions for children.



George Wodicka, PhD

Vincent P. Reilly Professor of Biomedical Engineering

George R. Wodicka is the founding head of Purdue's Weldon School of Biomedical Engineering and a leader in biomedical acoustics research. His work has helped millions through innovations in healthcare technology, including a neonatal breathing tube system now marketed by Medtronic. He's earned numerous teaching and commercialization awards and is a Fellow of IEEE and AIMBE.

Emergent Mechanisms in Biology of Robustness Integration and Organization Institute (EMBRIO)



The EMBRIO Institute is using artificial intelligence to uncover how cells grow, repair and replicate in response to biochemical and mechanical inputs. By combining engineering, biology and computation across seven partner institutions, EMBRIO researchers are developing new ways to understand and predict cellular organization.

With AI-driven 3D simulations, the team can model nonhuman embryo development, explore how tissues change and connect diverse biological systems—from cellular chemistry to electrical signaling and mechanics. Their discoveries could inform breakthroughs in human health and longevity while also training students in cutting-edge techniques that prepare them to lead the future of integrative biology. Purdue serves as EMBRIO's home base, supported by the National Science Foundation.

Scan to read more:



Medical Scientist Training Program MD/PhD BME

The Indiana University Medical Scientist Training Program is a joint effort between the IU School of Medicine and Purdue's Weldon School of Biomedical Engineering. It offers an MD/PhD in Biomedical Engineering—the only engineering doctorate in the MSTP and one of few nationwide.

The program blends strong mentorship, broad research opportunities and a unique curriculum focused on innovation, translation and professional development. **"Students benefit from a collaborative environment with diverse faculty, personalized training and a supportive community,"** shared Sherry Harbin, professor of Biomedical Engineering and Basic Medical Sciences.

Scan to read more about the MSTP program:



From Purdue to Medtronic's Highest Honor

Purdue Alumna Kristen Cattin Inducted into Medtronic's Prestigious Bakken Society



Kristen Cattin

Bakken Society Inductee 2025

When Kristen Cattin arrived at Purdue to study electrical and computer engineering, she could not have foreseen that her path would one day lead her to the highest technical honor at Medtronic. This August, Cattin was inducted into the Bakken Society—an elite group of 209 Fellows out of Medtronic's 95,000 employees worldwide. The society recognizes the company's most distinguished scientists, engineers and clinicians for their lasting contributions to patient care.

Cattin earned both her bachelor's and master's degrees in electrical and computer engineering at Purdue. As a graduate student in Professor George Wodicka's biomedical acoustics laboratory, she completed her thesis on a miniature bioacoustic telemetric device and served as an award-winning teaching assistant in the renowned physiological measurements course.

"Kristen combined technical excellence with a gift for teaching," Wodicka recalls. "It is no surprise she has gone on to lead at the highest levels."

That foundation at Purdue proved invaluable when Cattin joined Medtronic more than 22 years ago as a systems engineer in cardiac rhythm management. She has since played a pivotal role in shaping the architecture of Medtronic's pacemaker portfolio. Most notably, she served as the lead systems architect for the BlueSync™ technology that introduced Bluetooth-enabled pacemakers. This breakthrough allowed patients to check their pacemaker status securely through their smartphones for the first time—transforming accessibility, ease of use and peace of mind for patients of all ages.

"My commitment has always been to improve patients' lives and address clinicians' needs," Cattin says. "Hearing patients' stories about how our products have impacted their lives is both inspirational and rewarding."

Medtronic
Further. Together.®



Teri Whitman

Bakken Society Inductee 2018

Her work has been recognized not only for technical rigor but also for its broad impact on patient care.

"Kristen drove the success of Medtronic's first pacemaker that uses Bluetooth communication," says fellow Bakken Society member Teri Whitman, also a Purdue alumna and former Wodicka student. "She is a role model who combines deep expertise with a passion for mentoring the next generation of engineers."

For Cattin, the honor of joining the Bakken Society is both humbling and motivating. "I am honored and grateful to be recognized alongside such extraordinary colleagues," she reflects. "This recognition inspires me to continue supporting Medtronic's mission of alleviating pain, restoring health and extending life."

With her induction, Cattin becomes the second of Wodicka's former students to join the Bakken Society. Her story is a testament to the power of Purdue's rigorous engineering education—and to the lifelong impact Boilermakers continue to make in advancing healthcare worldwide.

ALUMNI SUCCESSES

What is 38x38?

Neil Armstrong was 38 years old when he became the first person to set foot on the moon. Inspired by his legacy, the Purdue Engineering 38X38 award celebrates 38 alumni 38 years old and younger who have swiftly risen to the top of their fields. These Boilermakers are achieving career milestones in record time.

FALL 2025



Brooke Beier

BME'08, MS'09, PhD'13
Senior VP, Purdue Innovates



Keith Hansen

BME'12
CEO, Diatiro



Krista O'Shaughnessey Toler

BME'09, MS'10
Assoc. Director of R&D,
Zimmer Biomet

FALL 2024



Arjun Ishwar

BME'07, MS'09
VP of Sales & Marketing,
Miach Orthopediatrics



Adam Yestrepsey

BME'10, MS'12
VP of R&D, enableCV, Inc.



Rush Bartlett

BME PhD'12
Entrepreneur, Executive,
Lecturer & Consultant

Distinguished Engineering Alumni



Leslie Bottorff

BSIDE, 1979
Senior Executive Advisor



Jennifer Kerr

BSIDE, 1993
President, Cook Research Inc.



We would love to
learn and tell
your story!
Please share
your successes!

Umesh Patel honored with Innovation Award

Patel is an innovative global leader in the medical device and regenerative medicine industry. He was one of two employees first hired to startup Cook Biotech and who together lead the organization on a global scale today. He holds more than 50 US patents and is the author of more than 14 peer-reviewed publications. Each patent has a story and a need to improve the health of countless patients.



SCAN TO LEARN MORE



Guided by Our Board, We Keep Advancing



James R. Baumgardt
Retired, President
Guidant Foundation



Leslie Bottorff
Principal, 30 Years of
MDE
Bottorff Advisors



Leony Boudreau
Strategy & Operations
NBA



Tobias Buck
Founder
Paragon Medical,
Topikos Scientific



Gary Conkright
CEO and Co-founder
physIQ



Michael Dale
President, CEO and
Board Director of Axogen



John DeFord
Board Member of Nordson
Corporation, Globus Medical,
Maravai Lifesciences, Enable
Injections, Blue Spark



Natacha DePaola
Professor of Biomedical
Engineering, Director
Digital Medical Engineering &
Technology Center, Illinois
Institute of Technology



Marta Gross
Retired Partner
Goodwin Procter LLP



Dan Hann
Retired, Trustee
Biomat, Franklin College



Eduardo Juan
Professor, Dean
Purdue, UPRM College of
Engineering



Aaron Kyle
Professor
Biomedical Engineering
at Duke University



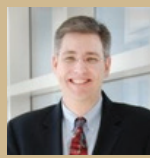
Bets Lillo
Independent Board
Director at River Logic



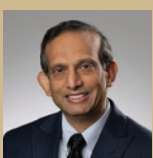
Jeffery Mansfield
Entrepreneur



Daniel Moore
Chair of the Board of
Directors
CMR Surgical



Jorge Ochoa
Principal
Engineering Systems, Inc.



Umesh Patel
Retired
Cook Biotech



John Pearce
Professor at The University of
Texas at Austin Chandra
Department of Electrical and
Computer Engineering



Derek Small
Founder, Managing
Director
Luson Bioventures



Tom Weldon
Founder, Chairman and
CEO
Ponce De Leon Health



Teri Whitman
Research Director
Medtronic, Inc.

ADVISORY BOARD IN ACTION



Léony Boudreau: From Boilermaker to NBA Innovator

Léony Boudreau (BS BME '21, MS BME '22) is a former Purdue women's basketball player whose career-ending concussions led her to co-found Wheel RIISE and launch a student organization to advance sports accessibility. Today, she serves as a basketball strategy and operations manager with the NBA, combining her engineering training and athletic experience to develop innovative technologies that grow the game.

Read more about
Leony's story here:

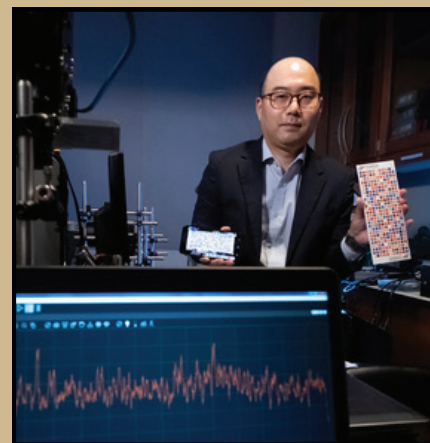


READ STORY

'More than just an image': Purdue tech extracts hyperspectral info from conventional photos

Professionals in agriculture, defense and security, environmental monitoring, food quality analysis, industrial quality control, and medical diagnostics could benefit from a patent-pending innovation that opens new possibilities of conventional photography for optical spectroscopy and hyperspectral imaging.

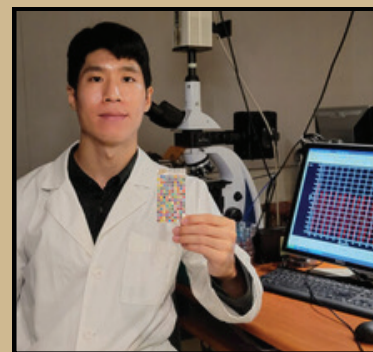
Young Kim, Purdue University professor, University Faculty Scholar and Showalter Faculty Scholar, and postdoctoral research associate Semin Kwon of the Weldon School of Biomedical Engineering created an algorithm that recovers detailed spectral information from photographs taken by conventional cameras. The research combines computer vision, color science and optical spectroscopy.



"A photograph is more than just an image; it contains abundant hyperspectral information," Kim said. "We are one of the pioneering research groups to integrate computational spectrometry and spectroscopic analyses for biomedical and other applications."

A paper about the team's research has been published in the peer-reviewed journal IEEE Transactions on Image Processing.

Kim disclosed the innovation to the Purdue Innovates Office of Technology Commercialization, which has applied for a patent to protect the intellectual property. Industry partners interested in developing or commercializing the algorithm should contact Patrick Finnerty, assistant director of business development and licensing – life sciences, at pwfinnerty@prf.org about track codes 70097, 70251, 70322 and 70335.



GENERALIZABILITY AND SIMPLICITY

Kwon said the work emphasizes recovering the arbitrary spectrum of a sample rather than solely relying on specific data-driven learning or pretrained algorithms, which excel only in preset tasks and samples.

The team's method uses an algorithmically designed color reference chart and device-informed computation to recover spectral information from RGB values acquired using conventional cameras, such as off-the-shelf smartphones.

"Most importantly, the spectral resolution — around 1.5 nanometers — is highly comparable to that of scientific spectrometers and hyperspectral imagers," Kwon said. "Scientific-grade spectrometers have fine spectral resolution to distinguish narrow spectral features. This is critical in applications like biomedical optics, material analysis and color science, where even small wavelength shifts can lead to different interpretations."

Kim said one advantage the Purdue method has over traditional technology is its algorithmic generalizability.

BME Professional Master's Program

Choose a program:

- Biomedical Device Development
- Artificial Intelligence & Digital Health
- Online

Earn a Graduate Certificate:

- Regulatory Science & Regulatory Affairs for Medical Devices

Engineer Health and Advance Your Career

MS degrees designed with industry in mind!

- **Fast:** The program can be completed in one year (fall, spring and summer sessions).
- **Approachable Faculty:** Whether you're in the classroom or in the halls, our faculty are always willing to engage with students.
- **Flexible:** A flexible curriculum and ample electives enable you to custom design a plan of study to fit your interests, career advancement goals and needs of your chosen industry.
- **Regulatory Affairs & Entrepreneurship:** Acquire a well-rounded education, business acumen and highly marketable skills in entrepreneurship and regulatory affairs. Develop your expertise in preclinical and clinical study design, regulatory processes, quality systems and engineering ethics.
- **Professional Development & Leadership:** Stay competitive in an evolving industry, advance to leadership positions and broaden your opportunities in the biomedical device industry.
- **Internship Opportunity:** Take advantage of the optional industry immersion experience for a six- to 12-month internship with a leader in the field of biomedical device development.
- **Like-minded Peers:** Study with students who have a similar background in engineering, science or other technical disciplines and who either enrolled directly from undergraduate programs or have some industry experience.

LEARN ABOUT ON CAMPUS:



#5

BIOMEDICAL ENGINEERING GRADUATE PROGRAM

AMONG UNIVERSITIES WITHOUT A MED SCHOOL OR A JOINTLY ADMINISTERED BME PROGRAM WITH MED SCHOOL.

U.S. NEWS & WORLD REPORT, 2025

LEARN ABOUT ONLINE:



Weldon School Faculty



Karen Alfrey

Professor of Engineering Practice, Biomedical Engineering

Indianapolis



Charlie Babbs

Founding Member and Senior Lecturer, Biomedical Engineering

West Lafayette



Edward Bartlett

Professor of Biological Sciences and Biomedical Engineering

West Lafayette



Brock Beauclair

Lecturer, Biomedical Engineering

Indianapolis



Charles Bouman

Showalter Professor of Electrical and Computer and Biomedical Engineering

West Lafayette



Andrew Brightman

Professor of Engineering Practice, Biomedical Engineering

West Lafayette



Deva Chan

Director of Graduate Programs, Associate Professor of Biomedical Engineering

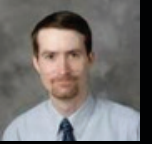
West Lafayette



Shelley Claridge

Professor of Chemistry and Biomedical Engineering

West Lafayette



Jonathan Cody

Visiting Assistant Professor, Biomedical Engineering

West Lafayette



Eugenio Culurciello

Professor of Biomedical Engineering

West Lafayette



María Dadarlat

Assistant Professor of Biomedical Engineering

West Lafayette



Edward Delp

Charles William Harrison Distinguished Professor of Electrical and Computer Engineering and Biomedical Engineering

West Lafayette



Bradley Duerstock

Professor of Engineering Practice, Biomedical and Industrial Engineering

West Lafayette



Joaquín Goñi

Associate Professor of Industrial Engineering and Biomedical Engineering

West Lafayette



Craig Goergen

Associate Head for Clinical Engagement and Professor of Biomedical Engineering and University Faculty Scholar

West Lafayette



Leopold Green

Assistant Professor of Biomedical Engineering

West Lafayette



Sherry Harbin

Professor of Biomedical Engineering and Basic Medical Sciences

West Lafayette



Jennifer Hatch

Lecturer, Biomedical Engineering

Indianapolis



Michael Heinz

Interim Head and Professor of SLHS and Professor of Biomedical Engineering

West Lafayette



Steven Higbee

Director of BME Programs in Indianapolis and Associate Professor of Practice, BME

Indianapolis



Fang Huang

Reilly Associate Professor of Biomedical Engineering

West Lafayette



Krishna Jayant

Leslie A. Geddes Assistant Professor of Biomedical Engineering

West Lafayette



Julie Ji

Associate Professor of Biomedical Engineering

Indianapolis



Taeyoon Kim

Associate Professor of Biomedical Engineering

West Lafayette



Young Kim

Professor of Biomedical Engineering

West Lafayette



Tamara Kinzer-Ursem

Associate Dean of Graduate and Professional Education, College of Engineering and Professor of Biomedical Engineering

West Lafayette



Fiona Kolbinger

Research Assistant Professor of Biomedical Engineering

West Lafayette



Nan Kong

Professor of Biomedical Engineering and Industrial Engineering

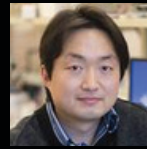
West Lafayette



Michael Ladisch

Distinguished Professor of Agricultural and Biological Engineering and BME

West Lafayette



Chi Hwan Lee

Professor of Biomedical Engineering and University Faculty Scholar

West Lafayette



Hyowon (Hugh) Lee

Professor of Biomedical Engineering

West Lafayette



Chien-Chi Lin

Professor of Biomedical Engineering

Indianapolis

Weldon School Faculty

Learn more about our **faculty**:



Learn more about our **research**:



Jacqueline Linnes

Associate Head for Research
and Marta E. Gross Professor
of Biomedical Engineering

West Lafayette



Michael Linnes

Lecturer, Biomedical
Engineering

West Lafayette



Julie Liu

Professor of Chemical
Engineering and
Biomedical Engineering

West Lafayette



Aaron Lottes

Assistant Dean for
Engineering in Indianapolis
and Professor of
Engineering Practice, BME

West Lafayette



Ramses Martinez

Hall family Rising Star
Associate Professor of
Industrial Engineering and
Biomedical Engineering

West Lafayette



Sharon Miller

Assistant Vice Provost
and Professor of Practice
for Biomedical
Engineering

Indianapolis



Sungsoo Na

Associate Professor of
Biomedical
Engineering

Indianapolis



Andrew Otte

Research Associate
Professor of Biomedical
Engineering

West Lafayette



Kevin Otto

Dane A. Miller Head and
Professor of Biomedical
Engineering

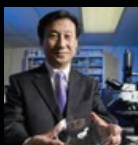
West Lafayette



Estelle (Sunghee) Park

Assistant Professor of
Biomedical Engineering

West Lafayette



Kinam Park

Showalter Distinguished
Professor of Biomedical
Engineering and Pharmacy

West Lafayette



Elsje Pienaar

Director of Undergraduate
Programs and Associate
Professor of Biomedical
Engineering

West Lafayette



Taimoor Qazi

Assistant Professor of
Biomedical
Engineering

West Lafayette



Vitaliy Rayz

Associate Head of Academic
Programs and Professor of
Biomedical Engineering

West Lafayette



J. Paul Robinson

Distinguished Professor of
Cytometry/SVM Professor of
Basic Medical Sciences and
Biomedical Engineering

West Lafayette



Anne Soreno

Professor of Psychological
Sciences and Biomedical
Engineering

West Lafayette



Behzad Sharif

Associate Professor of
Biomedical Engineering

Indianapolis



Riya Shi

Mari Hulman George Endowed
Professor of Applied
Neuroscience and BME

West Lafayette



Luis Solorio

Associate Professor of
Biomedical Engineering

West Lafayette



Steven Steinhubl

Vincent P. Reilly Professor
of Biomedical Engineering

West Lafayette



Ramaswamy Subramanian

Gerald and Edna Mann Director,
Bindley Center for Bioscience
and Professor of BME

West Lafayette



Rachel Surowiec

Assistant Professor of
Biomedical Engineering

Indianapolis



Matthew Tews

Associate Dean and regional
Campus Director of IUSM-WL in
Medical Education and Professor of
Engineering Practice, BME

West Lafayette



Yunjie Tong

Associate Professor of
Biomedical Engineering

West Lafayette



David Umulis

Senior Vice Provost and
Professor of Biomedical
Engineering

Indianapolis



Juan Wachs

James H. Barbara H. Greene
Professor of Industrial
Engineering and BME

West Lafayette



Joseph Wallace

Associate Vice President for
Research Development and
Professor of Biomedical
Engineering

Indianapolis



Matthew Ward

Assistant Professor of
Biomedical Engineering

West Lafayette



George Wodicka

Vincent P. Reilly Professor of
Biomedical Engineering and
Professor of Electrical and
Computer Engineering

West Lafayette



Hiroki Yokota

Professor of Biomedical
Engineering

Indianapolis



Kenichi Yoshida

Professor of Biomedical
Engineering

Indianapolis



Li Zhan

Assistant Professor of
Mechanical Engineering and
Biomedical Engineering

West Lafayette



PURDUE
UNIVERSITY®

206 S Martin Jischke Dr
West Lafayette, IN 47907

Weldon School of
Biomedical Engineering

