

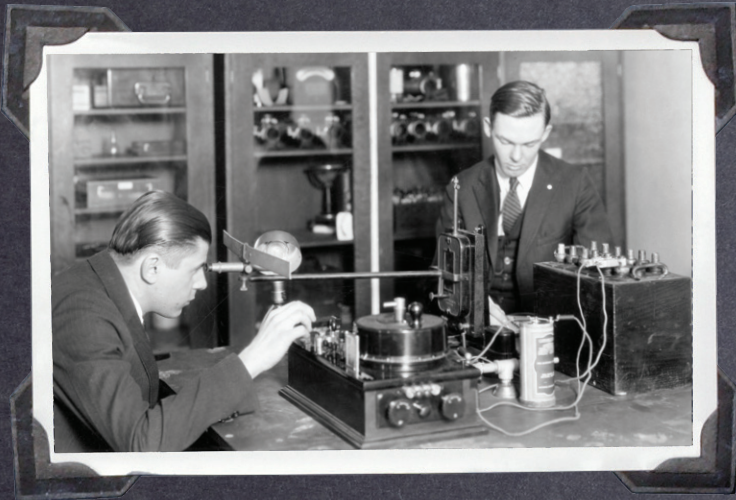
CLEVELAND STATE UNIVERSITY

WASHKEWICZ

MAGAZINE

COLLEGE OF ENGINEERING

2023–2024 ISSUE



Celebrating the



FENN COLLEGE
100
Est. 1923



Centennial

"Ton" is Always in Motion | Omar Kasalo's Triumph Over Tragedy
Donald E. Washkewicz Distinguished Alumni Award | Ed Basta Forging Connections

Celebrating 100 Years of **Social Mobility and Economic Impact**



Washkewicz College
of Engineering



Message from the DEAN



GREETINGS!

I love origin stories. When you know your roots, you have a better glimpse of your accomplishments and possible paths forward. That's why it's important we celebrate the centennial of Fenn College, the private institution founded in 1923 that once served as the nucleus of Cleveland State University.

We are also commemorating 100 years of our cooperative education program, which enables undergraduate students to gain practical engineering experience as they alternate between classes and working for local employers.

Since CSU opened in 1965, absorbing Fenn College, we have seen numerous and rapid developments in the engineering disciplines taught by its predecessor, as well as entirely new and ever-changing specialties such as biomedical engineering, computer science and data science. The Washkewicz College of Engineering constantly adapts to changes in industry and higher education, and we always commit to doing more. We provide students with up-to-the-minute education, hands-on learning opportunities and career assistance; supporting faculty on ultramodern research; and encouraging collaboration to set our eyes on new, previously imperceptible sights.

As we celebrate the Fenn College Centennial, we are spearheading and expanding crucial initiatives, including:

- **Integrated, interdisciplinary academic programs.** The University hopes to launch as many as 20 new undergraduate majors in fall 2024, and our college is involved in nearly two thirds of them.
- **Student entrepreneurship and innovation.** Undergraduate students initiating their own senior design projects will submit them into the StartUp Vikes competition offered by CSU's Center for Innovation and Entrepreneurship with support from the Monte Ahuja College of Business.
- **Strengthening our commitment to diversity, equity and inclusion (DEI).** Efforts to advance DEI at Washkewicz College will include outreach through the Cleveland Metropolitan School District and Cleveland's inner-ring suburbs.

The cover story on page 14 dives into Fenn College's history, observing the ground to which we're proudly anchored, and includes insights from Washkewicz College and CSU leaders eyeing our future.

Of course, we would be nowhere today if it were not for our alumni. For example, Katie Davis '07, mechanical engineering graduate, and her husband, Brandon Davis, also a CSU alum, have established the Katie D. Davis Engineering Scholarship for students pursuing a mechanical, electrical, civil or chemical engineering degree. We are immensely grateful for their support and the support we get from all donors. You can read about the scholarship and the Davis's career and philanthropy on page 26.

Flip to page 28 to read about another impressive alum, Edward Basta '82. After graduating with CSU's last class of undergraduate metallurgical engineering students, Ed impressively came up in his trade working with a variety of materials and applications, then ran his own consulting business for nearly 20 years. We are truly proud of Ed's numerous accomplishments and his impact on the CSU brand.

Spring 2023 Valedictorian Christian Warner '23 made the decision to continue his education at Washkewicz College while launching his engineering career. Starting on page 8, the Accelerated Program 4+1 civil engineering student and staff engineer at Soil and Materials Engineers, Inc. discusses the impact that friends, family and faith have had on him as he worked toward his already-towering achievements.

At Washkewicz College, we encourage lifelong learning, the kind that is epitomized by faculty such as Dr. Antonie "Ton" van den Bogert. Dr. Ton retired in 2023 and was granted the title of professor emeritus at CSU. Throughout his career, Ton researched motions of horses, studied sports injuries and control of arm movements, simulated body movements, developed motion capture software for movies and much more. His story begins on page 4.

Since I joined the Washkewicz College of Engineering as dean in 2022, college stakeholders continue to constantly impress me with their passion, boldness, knowledge and teamwork. Likewise, it came as no surprise when I learned about the rich history of Fenn College in which we are steeped. I believe that for the next 100 years, this institution will continue to accomplish many great things.

A handwritten signature in black ink, reading "Richard T. Schoephoerster".

RICHARD T. SCHOEPHOERSTER, PH.D.
Dean and Professor

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President
Cleveland State University

RICHARD T. SCHOEPHOERSTER, PH.D.

Dean
Washkewicz College of Engineering

AUDREY M. WIGGINS

Editor-in-Chief/Contributing Writer
Washkewicz College of Engineering

KRISTIN BROKA, M.S.

Managing Editor
University Marketing

REENA ARORA-SÁNCHEZ

Editor
University Marketing

JIM LIGHTCAP

Art Director
University Marketing

GABRIELLE WISE

Graphic Designer
University Marketing

BRIAN HART

Photography

PATRICK J. WILLIAMS

Freelance Writer

CONTRIBUTING PHOTOGRAPHERS

Audrey M. Wiggins








CAMPUS LOCATION

Cleveland State University
Washkewicz Hall, Room 305
2300 Chester Avenue
Cleveland, Ohio 44115-2214

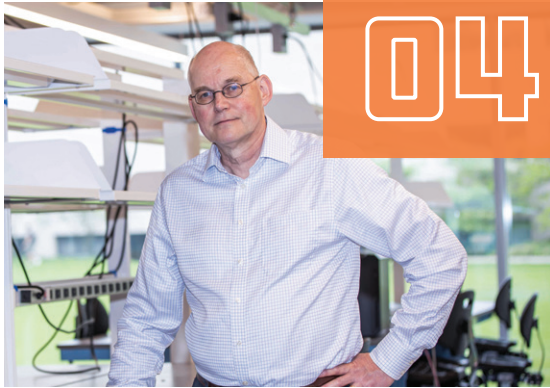
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**DR. ANTONIE "TON"
VAN DEN BOGERT IS**

ALWAYS — IN — MOTION



Dr. Antonie
van den Bogert,
professor emeritus

From researching sports biomechanics to developing motion capture software for movies, Dr. Ton has always skillfully tackled new challenges. We thank the new retiree for his key role in developing the Washkewicz College of Engineering as we know it.

After 11 years of esteemed service to the Washkewicz College of Engineering and Cleveland State University community, Dr. Antonie "Ton" (pronounced "Tawn") van den Bogert retired and was named professor emeritus.

Dr. Ton, as he is known around campus, served as director of the Human Motion and Control Laboratory and Parker Hannifin Endowed Chair in Human Motion and Control in the Department of Mechanical Engineering. His research interests and expertise include musculoskeletal modeling and simulation, sports biomechanics, rehabilitation, prosthetics and orthotics.

Applying Great Knowledge

With an interest in theoretical physics, Ton earned his bachelor's and master's degrees in physics and applied mathematics from Utrecht University in the Netherlands in 1985 and worked in nuclear fusion. After realizing his interests lay more in applied science, he performed computational modeling of horse motion at Utrecht University and earned a Ph.D. in veterinary sciences from the university in 1989.

"It was really the early days of motion capture," Ton recalled. "A lot of the things we did were related to mechanical engineering. We did strain measurements in tendons and bones and strength testing of all sorts of tissues. My project was about computer simulation, and I got really good at that, and I realized that I was in a really small field. I was the only one in the world doing anything like that."



Dr. Antonie van den Bogert at the Human Motion and Control Laboratory ribbon cutting

“That became enormously successful,” Ton said. “We developed software for motion capture for the movie industry.”

Ton’s development of motion capture technology helped bring animated characters to life in hit films such as “The Lord of the Rings: Return of the King,” “The Matrix Reloaded,” “The Matrix Revolutions,” “I, Robot,” “King Kong” and “Sky Captain and the World of Tomorrow.” In 2005, he received a Technical Achievement Award from the Academy of Motion Picture Arts and Sciences, bestowed upon him by actor Scarlett Johansson.

Ton’s development of motion capture technology helped bring animated characters to life in hit films such as “The Lord of the Rings: Return of the King,” “The Matrix Reloaded,” “The Matrix Revolutions,” “I, Robot,” “King Kong” and more.

“Without that difficulty of getting funding, I would probably never have gotten into that industry,” Ton said. “Every disadvantage can create an advantage if you let it, because it pushes you in a certain direction that in hindsight was something you should have done all along.”

A Career Move to Cleveland

While attending a conference in 1997, Ton ran into fellow accomplished engineer Dr. Brian Davis, who he had known for about 10 years. At the time, Davis was working at the Cleveland Clinic. (Those involved with

the Washkewicz College of Engineering now know Davis as associate dean of Research and Graduate Affairs and Mechanical Engineering Department interim chair.)

Ton recalled that Davis said to him: “Hey, we have a job. Would you be interested in applying for it?” I was happy where I was and I wasn’t really interested. But then he said, ‘Well, why don’t you just come to do a seminar?’”

Ton then chose to join the larger scientific community of human motion. In 1991, he moved to Alberta, Canada, to conduct sports biomechanics postdoctoral work at the University of Calgary, which had one of the best sports biomechanics labs in the world; this was after the 1988 Olympic Games in Calgary brought funding to the university.

When Ton gathered enough funding to fully focus on research at the University of Calgary, he did just that—with the exception of teaching the university’s most advanced biomechanics class.

However, there was a period when funding did not come through and Ton needed income. He decided to start consulting for Motion Analysis Corporation in Santa Rosa, CA, which makes motion capture equipment.



Dr. Antonie van den Bogert speaking at 2013 lab ribbon cutting

Ton agreed and gave the seminar. “It made a really good impression on me,” he said. “The city and the Cleveland Clinic and how they did research was very business-like, very professional. It was more in the medical field so a little better funded than sports research, I would say.” That experience convinced him to take the job at the Clinic and move to Cleveland.

From 1998 to 2010, Ton worked as a research professor at the Cleveland Clinic. He brought in funding as he worked with students, engineers and postdoctoral researchers. His work spanned biomedical and biomechanical engineering, including but not limited to simulating body movements and researching sports injuries and control of arm movements.

Ton left the Cleveland Clinic in 2010 to start his own consulting business, working with clients including Case Western Reserve University, Adidas and the Rehabilitation Institute in Chicago (now the Shirley Ryan AbilityLab); he also consulted for the Cleveland Clinic.

Then came an opportunity at Cleveland State University.

Contributing a “Ton” to CSU

A little over a decade ago, Parker Hannifin, a locally based leader in motion and control technologies for industry and transportation, called Ton to inform him that the business was funding a new endowed chair position in CSU’s Mechanical Engineering Department, with a focus on human motion and control.

Afterward, Ton met with Dr. William Atherton, who was then chair of the Mechanical Engineering Department and is now associate college lecturer with the Department of Engineering Technology.

“He lived up to the highest of expectations—a very talented and great guy,” Atherton recently said of Ton.

From one of his projects at the Cleveland Clinic, Ton already personally knew Dr. Hanz Richter, mechanical engineering professor, and Dr. Dan Simon, electrical engineering professor emeritus.

“I knew there were some people that I could really connect with; the whole atmosphere here was good, and they offered me lab facilities and startup funding,” Ton said. “Also, it gave me an opportunity to go in a bit of a different research direction because I would have funding for a few years to really develop something new, which otherwise I couldn’t have done.”

In 2012, Ton began his position as Parker Hannifin Endowed Chair in Human Motion and Control. The following year, the lab opened under his direction, equipping researchers with the latest resources to study and develop prosthetics, exoskeletons and other aids for injured and paralyzed patients and the elderly. The Cleveland Plain Dealer Editorial Board called the lab “a big step toward a better future.”

“We’ve been very lucky and privileged to have had Ton in the college for the last 11 years,” said Dr.

Richard Schoephoerster, Washkewicz College dean and biomedical engineering professor.

“His impact has been tremendous, as he was a key figure in developing our close collaboration with Parker Hannifin

and the college’s namesake, former Parker Hannifin CEO Don Washkewicz. His work and laboratory formed the foundation for what is now the Center for Human Machine Systems, which is currently our most prominent research center.”

Students and faculty in the Center for Human Machine Systems develop technology to transform the lives of people with disabilities in multiple ways, such as restoring motor functions, regenerating muscle tissue and assisting with tasks such as feeding.

From 2017 to 2019, Ton served as interim chair of the Mechanical Engineering Department. During that time, he ran into his old friend Davis at a “Hamilton” showing and invited Davis to join the faculty as chair.



He lived up to the highest of expectations—a very talented and great guy.

—Dr. William Atherton





“ His impact has been tremendous, as he was a key figure in developing our close collaboration with Parker Hannifin and the college’s namesake, former Parker Hannifin CEO Don Washkewicz. His work and laboratory formed the foundation for what is now the Center for Human Machine Systems, which is currently our most prominent research center.

—Dr. Richard Schoephoerster



Dr. Ton demonstrating motion control exoskeleton at ribbon cutting ceremony

Davis was ready for a move to CSU and quickly became associate dean of Research and Graduate Affairs.

While wrapping up his career as a full-time professor, Ton continued to make waves. In February 2023, he and Washkewicz College graduate Christopher Schroeck '19 were named on a U.S. patent, “Rotation Monitoring System and Method.” The protected technology is a mobile app-connected sleeve that athletes, strength trainers and people undergoing physical therapy can wear during training and exercise to monitor ranges of motion, according to the patent abstract.

As professor emeritus, Ton said he still has his office and plans on coming in once a week to supervise two doctoral students and one undergraduate student. “I like the idea that I can still go in the lab,” he said.

“I am quite confident he will continue to remain very active as an emeritus faculty member and continue to mentor and influence CSU faculty and students for years to come,” Schoephoerster said.

Looking back on his career, Ton said he is glad that he was willing to take chances and pivot.



For me that twisted path of doing something completely different every 10 years from horses to sports, to orthopedics, to mechanical engineering—that has been really good for me,” Ton said. “You never have to be afraid that you don't have work anymore. You can just go in a new direction. You have your skills. You can always develop new skills. And you can always be successful. I feel like if students can develop that sort of confidence in themselves, you’re set up for a really good career.

—Dr. Antonie “Ton” van den Bogert



CHRISTIAN WARNER '23

LOOKS AHEAD BY LOOKING UP



Christian Warner, Valedictorian

Warner became interested in building things when he began piecing together Legos at seven years old. It's a hobby he continues today. Some of his favorite freeform builds have been a tall pirate ship, a commercial jet, various cars and a lever-powered factory floor with conveyer belts, trucks and cranes.

When he was younger, Christian Warner liked copying designs or coming up with his own. "I also enjoyed using my hands to create something and challenging myself to see if I could make the pieces look and work the way I envisioned them to be," he said.

Warner chose to scale his passion for building by studying civil engineering at Washkewicz College. He graduated as the Spring 2023 valedictorian with a bachelor's degree in the field. As a student in the Accelerated 4+1 Program, he plans to earn a master's degree in civil engineering in fall 2023.

"Today, I enjoy envisioning how a structure looks and how it will be used," Warner said. "It's especially cool to see it being built from the ground up."

It's fitting that upon graduation, Warner began working as a staff engineer in Construction Materials and Testing Services at Soil and Materials Engineers, Inc.

"My primary job is to basically test concrete, asphalt or soil to make sure that it meets engineering standards, that it's safe. I'm also getting into a little bit of the design and decision-making aspect of it as well," Warner said.



Valedictorian Christian Warner and family

THE PROFESSORS ARE GREAT. THEY WANT TO WATCH YOU LEARN. THEY'RE VERY KNOWLEDGEABLE AND PRACTICAL. THEY PREPARE THE STUDENTS WELL.

Warner has achieved success at CSU by asking professors questions, teaching and coaching others, networking with professors and industry professionals, and sharing ideas back and forth with peers.

Networking can help engineering students land a job out of college, he advised. "All the career fairs that Cleveland State offers—just go to them and talk to as many people as you can. Make friends with your professors; they make great references."

Previously, Warner interned at Buyers Products, where he performed OSHA compliance checks, safety training and site investigations, and managed projects.

He also has some teaching and coaching experience. He took Structural Steel Design as an undergraduate, then served as a teaching assistant for the course a year later.

Warner found that teaching, grading homework and drafting example problems helped him better understand class topics. "I was forced to review the material in more depth than I had beforehand, so I would get a little more advanced knowledge in the subjects and basically just relearn the class with the class," he said.

In fall 2021 and 2022, he coached a BEST Robotics team of middle and high school students. He worked on courses for the robots to complete, coached the team's driving of the robots, and helped design machine mechanisms.

Warner's brother, Matthew, who is in high school, was on Warner's BEST Robotics team in 2021 and 2022. Partially because of that experience, Matthew is interested in studying mechanical engineering, Warner said. Additionally, their sister Eliza, also in high school, is considering civil engineering.

Their older sister, Holly, is a familial inspiration. She has received her bachelor's, master's and doctorate degrees in mechanical engineering, all from CSU.

Warner recalled that he chose to attend the University in part because he could stay home and be with his family. He remains involved in community activities with his church, Crossroads Community Church in Madison. For example, he has cleaned inside local public schools and landscaped their grounds, and has provided children with school supplies who need them. He also works on cars with the church's race team.

He said another reason he selected CSU was because he knew that when his sister Holly attended, she liked the mechanical engineering program and professors. He ended up feeling the same way about the civil engineering department.

"The professors are great. They want to watch you learn," he said. "The class that's going to graduate this coming year—they're a great group of students. They have a really cool community there."



Omar Kasalo



TRIUMPH OVER TRAGEDY

Omar Kasalo '25 embodies resilience, from fleeing war in the Democratic Republic of Congo at the age of nine to studying mechanical engineering and coaching tennis at Cleveland State University.

When Omar Kasalo was a child, his family raised cows, sheep and goats on a large tract of land. They were settled in the village of Rwenena in the Democratic Republic of Congo's South Kivu province when the Rwanda-backed group Rally for Congolese Democracy invaded.

"They burned the houses and people were slaughtered," Kasalo recalls.

As locals in the Mai-Mai group defended the territory, his father and three of his brothers fled in one direction. Kasalo

“ We had been having wars from when I was born, but that day was terrifying. ”

escaped with his mother, one older brother, Shabani, and two younger sisters, Walga and Umi.

"We had been having wars from when I was born, but that day was terrifying," Kasalo said.

A stranger boarded Kasalo and his group into a rowboat and took them across the Ruzizi River to the country of Burundi, where they sought and gained refugee status from the government.



Village in Democratic Republic of the Congo—*Adobe Stock*

Living as Refugees in East Africa

Life in Africa remained tough for Kasalo and his family. In 2010, he heard that his father, who had already suffered a stroke, had died.

His three oldest brothers who fled with their father are now living in Burundi, trying to come to the United States and receiving financial support from Kasalo.

In 2009, Kasalo and the family group he fled with first lived in Burundi with a widow they called Mama Petie in the city of Bujumbura. Like the stranger who took them across the Ruzizi, they did not know her. Mama Petie divided the room: one area was for her and her own four children, another for her business selling milk, and another for Kasalo and his family members. Eventually, Mama Petie could not afford to feed Kasalo and his family, only her own.

One day, Shabani sneaked into a tennis facility at the local recreation center, Entente Sportive de Bujumbura, and brought back some tennis balls.

At the center, “people thought maybe he was a ball boy,” Kasalo said. Soon, Shabani actually did become a ball boy.

“That’s how he got to try the game, and he liked it,” Kasalo said. “After two weeks, he brought me there.”

The International Tennis Federation (ITF) used the center’s facilities, and the skills that Kasalo and his brother had quickly developed caught ITF officials’ attention. The boys soon joined the ITF as players.

In 2011, Kasalo had the opportunity to play a two-week tournament in Nairobi, Kenya. The first week he lost in the finals, but the second week he won, which earned him a tennis scholarship.

“It was a dream come true,” Kasalo said. “My mom was very proud, and that \$50 I made a month—I gave it to my mom to help pay rent and my brother’s education.”

Things were going well for Kasalo with the ITF providing him with food and shelter. But he said, “I kept thinking of my family. Why am I eating nice and sleeping in a better place while my family are living in a worse condition? That affected my performance in tennis.”

With his performance down, Kasalo lost his tennis scholarship in 2013. Shabani, meanwhile, was trying to coach members of a tennis club for income, but that went against the federation rules for tennis players, so the federation kicked Shabani out.

Kasalo’s mother turned to the United Nations High Commissioner for Refugees, who directed her and the family members staying in Burundi to the Kavumu refugee camp in the Burundian province of Cankuzo. “Life is hell there,” Kasalo said. “Food and medical rations were low, and the houses were shoddily built with mud and straw.”

“Thieves dug holes to sneak into settlements at night as witches performed black magic,” Kasalo said.

Kasalo lived in the camp with Shabani, Walga, Umi and their mother for four years. Faculty from the Burundi English School, where Kasalo had attended during his scholarship, took him in for two years following his life at the refugee camp, as his family members had to stay back at the camp.

In 2011, Kasalo had the opportunity to play a two-week tournament in Nairobi, Kenya. The first week he lost in the finals, but the second week he won, which earned him a tennis scholarship.

In 2016, the United Nations notified the family that they would be able to settle in Australia. However, the destination changed to the U.S., and the family finally settled in Northeast Ohio in 2019.

In greater Cleveland—between the large infrastructure, numerous cars, well-built roads and lack of dust—Kasalo said, “I thought it was, frankly, paradise.”

Kasalo attended his final year of high school at the International Newcomers Academy at Thomas Jefferson High School, now Natividad Pagan International Newcomers Academy.



Omar Kasalo (far left) and CSU Tennis Team



Omar Kasalo, Aaron and Coach Brian Etzkin

A New Life in America

In 2020, Kasalo began studying at Cleveland State University as an electrical engineering major. The following year, he switched to mechanical engineering.

“I just wanted to invent stuff. I like creating things. When I grew up, we were making little cars out of wires, and we would make the wheel from something like this,” he said, holding up his cushiony sandal.

Kasalo has completed classes in kinematics, thermodynamics, fluid mechanics and more. He plans to graduate with his bachelor’s degree in 2025. After graduation, he said he would like to work at NASA or a large company such as Parker Hannifin.

As he continues his studies, Kasalo is bringing tennis back into his life in a major way.

In 2020, Kasalo wanted to try out for Cleveland State’s men’s tennis team and contacted Brian Etzkin, the University’s director of tennis and men’s tennis coach. Etzkin said Kasalo, who was 21 at the time, was too old to join. However, the two developed a rapport and became friends. Kasalo strung rackets for the men’s and women’s teams and the public, worked the front desk at Medical Mutual Tennis Pavilion, also known as “the bubble,” completed coach workshops with the United States

Tennis Association, coached the public and recently became an assistant coach for the men’s team.

“I have a giant appreciation for Omar,” Etzkin said. “He has gone from a ‘guy who watched all the matches’ to ‘team stringer’ to ‘certified teaching pro’ to ‘assistant coach.’ Omar is an inspiring guy! He has had to work very hard against many obstacles to get where he is, and he is always looking to help others.”

Etzkin added, “Hearing his story and getting to know what he’s overcome to get here, he’s a self-made success. I know he’s going to be super successful in life, whatever he chooses to do.”

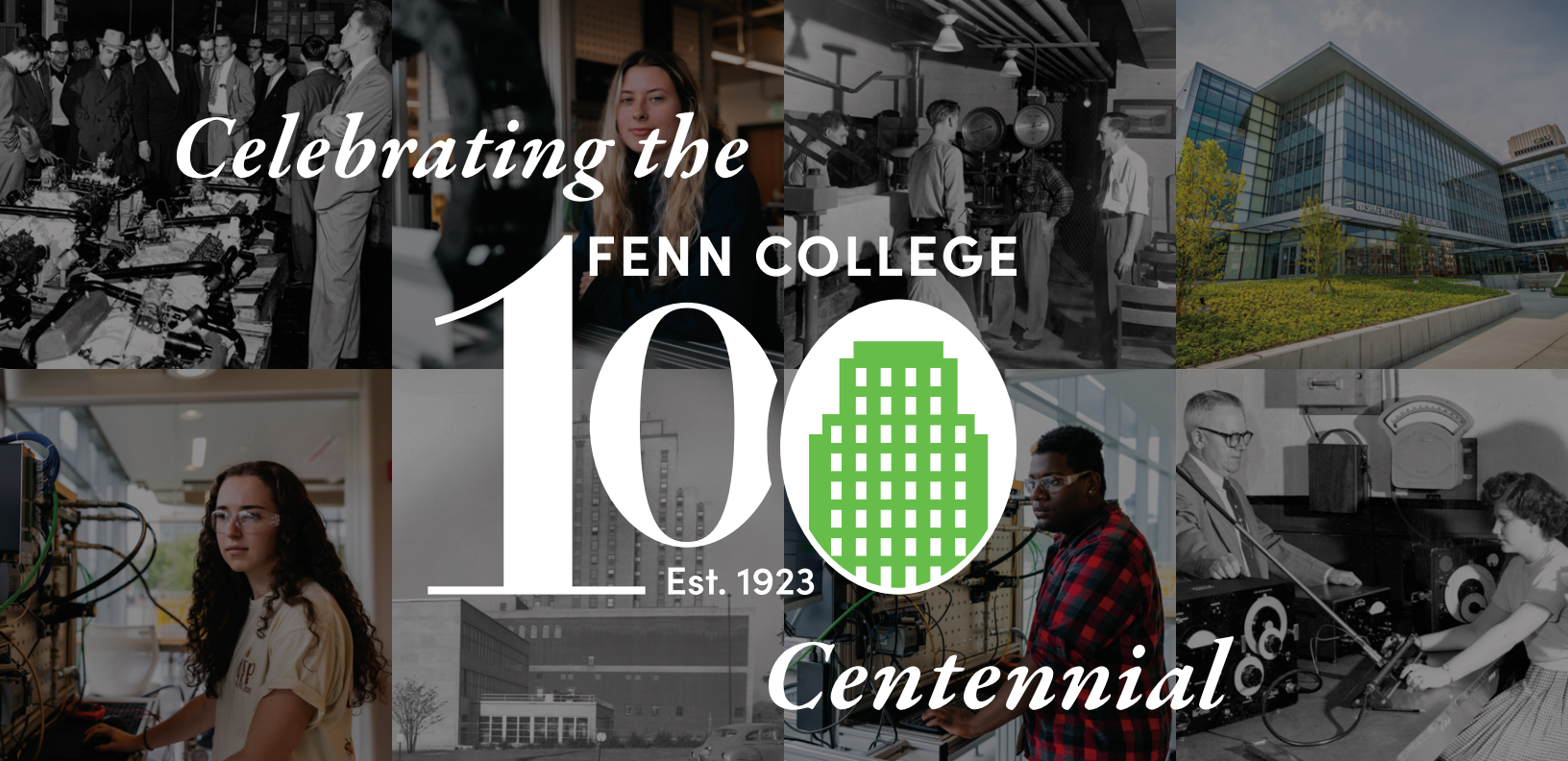
As Kasalo chases his dreams, his family in the U.S. is safe as they work to help Kasalo’s three brothers immigrate as well. Shabani is married with two children and works as a machine operator. Walga has a full scholarship to The Ohio State University to study biology with plans to work as an obstetrician-gynecologist. Umi attends high school.

Kasalo said he never could have envisioned his life taking the path it has.

“Everything is like a dream.”

**OMAR IS AN
INSPIRING GUY!
HE HAS HAD TO
WORK VERY HARD
AGAINST MANY
OBSTACLES TO
GET WHERE HE IS.
AND HE IS ALWAYS
LOOKING TO HELP
OTHERS.**

—Brian Etzkin, CSU Director of Tennis and Men's Tennis Coach



AFTER 100 YEARS, the educational institution that served as a basis for Cleveland State University lives on in the Washkewicz College of Engineering. As college and University leadership continue to honor a history of cooperative education and strong industry relationships, they plan to increase interdisciplinary studies, entrepreneurship and inclusivity.


Dr. Cecil Vincent Thomas, Fenn College’s first president, once said: “An institution of higher learning must be a living, dynamic organism if it is to adjust its curricula and program of education to the needs of young men and women of society.”* That ethos was required when Cleveland State University opened in 1965, using Fenn College as its core, and leaders at CSU and the Washkewicz College of Engineering say it is necessary today.

The year 2023 marks the centennial of when Fenn College first offered day classes for credit toward a bachelor’s degree and established its cooperative education program. The Cleveland YMCA first offered classes in the 19th century, creating a technical school soon to be renamed Fenn College, after Sereno Peck Fenn, Cleveland YMCA board director, president and college benefactor. Since then,

many changes have reinvented and invigorated the campus and its successor CSU—from the 1937 purchase of the building that was renamed Fenn Tower, or the “Campus in the Clouds,” built in the pre-Depression era for the upscale National Town and Country Club, to the 1971 opening of the higher-soaring Rhodes Tower, to the 2017 dedication of sleek, modern Washkewicz Hall.

For the past 100 years, cooperative education has allowed Fenn College and CSU engineering students to hone their skills working for businesses in and around Cleveland before graduation. Serving primarily as a commuter school with a bus turnaround where CSU’s Student Center is today,

Fenn College provided a low-cost education.† Its cooperative program was not only helpful to students to be able to work as they studied—it defined the college.



“An institution of higher learning must be a living, dynamic organism if it is to adjust its curricula and program of education to the needs of young men and women of society.”

—Dr. Cecil Vincent Thomas, Fenn College’s first president

“A big part of what we are celebrating is our connection with the community from day one,” said Washkewicz College of Engineering Dean Richard Schoephoerster. “So, that connection has evolved and continues to evolve, but what won’t change is our connection with the community.”

CSU President Laura Bloomberg pointed to an example of that connection: Sereno Peck Fenn was an early partner and vice president in Sherwin-Williams, which is today constructing a skyscraper in Cleveland. “I just think there’s something powerful about that company being the company that’s reinvesting down the street at Public Square with a whole new building,” she said.

Bloomberg also highlighted the college’s strong relationship with Donald Washkewicz, former president and CEO of Parker Hannifin, who has partnered with and supports CSU to bring its engineering college into a new era. “The fact that we have a Washkewicz College of Engineering that grew out of a proud Fenn history is pretty awesome,” she said.

Plans to further grow the college in size and scope involve increasing diversity, equity and inclusion (DEI). “First of all, economically, we need more people of color who have access to good-paying jobs with benefits that support their family,” Bloomberg said. “That’s what social mobility is about.”



Registering for classes in Fenn Tower Panel Hall. Fenn College Registrar Dr. William Patterson is on the left, 1947.

“But in terms of engineering, this idea that we have people who design and engineer the things that make our lives run is amazing. When you have a homogeneous group of people making those decisions and doing that designing, you get a homogeneous set of designed elements—in chemistry, in electronics, in mechanical engineering.”

Washkewicz College is also committed to making sure all students obtain work experience before graduating, either through cooperative education or internships, Schoephoerster said.

Meanwhile, creativity—institutionally and organically inspired—increases the entrepreneurial air of the college. Some engineering students have already created their own technologies in the Senior Design Capstone and in graduate programs. Looking ahead, Schoephoerster said

the college will further encourage, promote and assist entrepreneurship.

“The first 100 years were really about helping the businesses build up here. We’re going to continue to do that part of it,” Schoephoerster said. “But now, we want to be even more entrepreneurial and really contribute to the fabric of startup and entrepreneurship and building new enterprises here.”

Engineering student Vuk Bojovic in Washkewicz Hall Parker Lab, 2023.

“The first 100 years were really about helping the businesses build up here. We’re going to continue to do that part of it. But now, we want to even be more entrepreneurial and really contribute to the fabric of startup and entrepreneurship and building new enterprises here.”

—Dean Richard Schoephoerster



Integrated Fields of Study



Top: Washkewicz Hall, 2018.

Right: Fenn College with Fenn Tower in the background.



At Fenn College, various departments worked together. In 1939, mechanical engineering student Walter Schaefer and Physics Professor Willard Poppy created what was then the world's largest Foucault pendulum and hung it in a Fenn Tower air vent.‡ The 211-foot pendulum was taken down during tower renovations in the early 2000s.†

As the economy and workforce change, new engineering skillsets are required, which explains why Washkewicz College is heavily involved in CSU's larger plan to create interdisciplinary, integrated majors. As engineering disciplines will combine in certain instances to offer new student opportunities, engineering curricula will also pair with other CSU education outside of the college.

"The workforce of the future is going to be in multidisciplinary, interdisciplinary areas," said Dr. Nigamanth Sridhar, CSU's provost and senior vice president for academic affairs and computer science professor.

Dr. Murad Hizlan, Electrical and Computer Engineering Department chair, provided an example of how engineers already merge disciplines in the workplace: "If you are talking about electrical engineering, we need to have computer engineers and vice versa, and it's also not too easy to separate from computer science, either."

To that end, electrical engineering will form new integrated majors when combined with other fields of study—computer science, mechanical engineering and environmental science. The latter presents an example of another college's involvement, in this case Arts and Sciences.

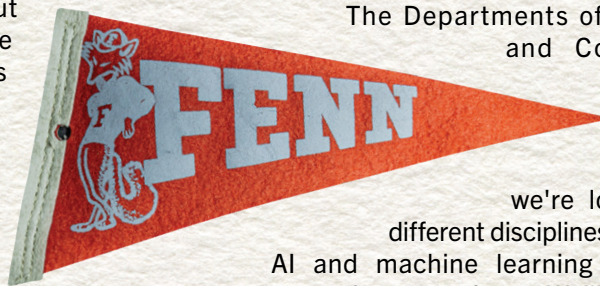
In Washkewicz's Department of Mechanical Engineering, summer 2023 Acting Department Chair Dr. Hanz Richter said ongoing academic development with the Electrical and Computer Engineering and Computer Science Departments will result in a major with a focus on mechatronics.

Physics combined with mechanical engineering is another possible new field of study, Richter said. Compared to a mechanical engineering degree, engineering courses related to dynamics, mechanics and vibration could be replaced with Physics Department material; compared to a physics degree, there could be more material on machinery and computer-aided design, Richter said. "For example, a mechanical engineering student that gets into this will take a course in quantum physics, and we know that the quantum computing technologies are coming at us at a fast pace," he said.

Dr. Yong Tao, Betty L. Gordon Endowed Professor and Chair of the Mechanical Engineering Department, received a more than \$1 million grant from the U.S. Department of Education in 2023 to create a new graduate concentration, Modeling and Simulation in Sustainable Energy Systems.

The Departments of Electrical Engineering and Computer Science and Teacher Education are also involved.

"With this new grant, we're looking to add a couple different disciplines," Tao said. "For example, AI and machine learning is a more traditionally computer science territory. We'll probably use them as more general knowledge—rather than in-depth computer science knowledge—to integrate a lot of the mechanical projects with the more in-depth applications."





Electrical Engineering laboratory in the newly remodeled Stilwell Hall, 1959.

In the Engineering Technology Department, one new undergraduate offering will be an upper division-only general engineering technology major, catered to graduates with associate's technology degrees from area community colleges. With classes offered Monday through Thursday evenings, the major would be well-suited to adult students with day jobs, said Dr. Michael Adams, department chair and Senior Design program director. "This is a pathway for real people, people living real lives, with real jobs, with real families, where they can fit in evening classes with a degree, utilizing their two-year associate degree to its fullest," he said.

In another upcoming major, engineering sales, students would learn subjects such as automation, mechanics and electronics alongside business courses such as sales and marketing, Adams said. And the Engineering Technology Department is developing an automation engineering technology major, he noted, adding that it would help fulfill local industry needs.

One interdisciplinary major in computer science will involve incorporating ethics education, Sridhar said. "We're producing all kinds of data, so how that data is managed and used has all kinds of ethical questions surrounded by it," he said.

This is a pathway for real people, people living real lives, with real jobs, with real families, where they can fit in evening classes with a degree, utilizing their two-year associate degree to its fullest

—Dr. Michael Adams



Engineering student Lillian Chan in Washkewicz Hall Parker Lab, 2023.

Sridhar gave the example of ShotSpotter, a technology that Cleveland uses to pinpoint the location of gunshots to which law enforcement can respond. As the technology is listening for gunshots, it could also be listening to conversations, and bias could play a role in determining where the technology is placed. "So, very quickly, we've gone from a technical problem with a technical solution to something that has all kinds of human implications," he said. Researchers in the Levin College of Public Affairs and Education have begun working with the city to study the technology's effectiveness and how to implement it.

Furthermore, Schoephoerster said new majors will include data science combined with health sciences to educate students interested in working with digital medical records, and computer science combined with english to support the burgeoning fields of artificial intelligence and natural language processing.

One example of interdisciplinary work already in action is the CSforCLE program, part of the national CSforAll non-profit initiative. "That's been some work that I've been involved with, personally, along with other colleagues, both in the engineering college as well as in our education college, focused on providing professional development and licensure preparation for teachers to teach computer science at the high school level," Sridhar said. The program has led to some

major developments, such as the creation of the John Marshall School of Information Technology in Cleveland—Ohio's first high school to focus on computer science.

Entrepreneurial Engineering

Washkewicz College is also focused on how students can turn classwork and projects into viable business ideas, Schoephoerster said.

Every spring, seniors' two semesters of Senior Design coursework culminate in the Senior Design Symposium and Poster Competition. Students benefit from the experience in manifold ways, Adams said, such as applying concepts they've learned to a single project and collaborating with fellow students. The projects can be industrially sponsored, student- or faculty-initiated or part of a national challenge.

In the future, Schoephoerster said students who initiate their own Senior Design projects will submit them into the fall StartUp Vikes entrepreneurship competition held by the business college.

"As they're developing the technology, they'll also be working on the business plan of it, meaning, 'What is the customer base for this?' What is the market for it?' and put the whole business case around the technology while they're also developing the technology itself, too," Schoephoerster said. "Then we hope to maybe get some spinoff companies from those ideas every once in a while."

Students who decide to create their own inventions in Senior Design can work with CSU's Technology Transfer Office, Sridhar said, adding that the office answers questions such as: "Is an invention absolutely a brand-new invention? Is there a potential for a patent? Can something be taken to the market?"

At the same time, collaboration with industry will continue to be key for students who take the industry-sponsored route for their projects.

Adams, who conducts industry outreach to bring industrially sponsored projects to the college, highlighted the importance of business's involvement. "When you have a third to half of the students working on a really meaty industrial project, and you realize that the same instructor is going to be grading all of you, it makes everybody up their game," he said.

Washkewicz College will continue to provide graduate students with entrepreneurial experiences as well. Students in the biomedical engineering master's design track, for instance, spend a year creating a medical device with mentors from local industry, often the Medical Device Solutions group at the Cleveland Clinic, said Dr. Nolan Holland, chair of the Chemical and Biomedical Engineering Department.



Engineering student Sophia Vozar in Washkewicz Hall Parker Lab, 2023.

The department encourages other biomedical engineering students to present business ideas and plans in competitions, Holland said. "The goal, is to get them to the point where they are thinking entrepreneurially and ready to work within the startup community here."

Exemplifying the type of longstanding partnerships with area businesses that cultivate leadership, the college is working with construction firms to start a construction management program.

"We're putting together the undergraduate program first and then a graduate program," said Dr. Stephen Duffy, Civil and Environmental Engineering Department chair. "At the graduate level, we're going to point toward an engineering management type of program instead of a construction management program."

Duffy said the University needs more students to support ongoing developments in engineering, citing the example of NASA's ongoing work with the Ohio Department of Transportation and other stakeholders to use drones for regional transportation.

Mechanical Engineering Professor Chester Kishel (1948–1981) taking senior engineering majors on a field trip to the Ford Motor Co.'s River Rouge Plant in Dearborn, Michigan.



Prioritizing Diversity, Equity and Inclusion

In 1965, when Fenn College was transferred to the state to be absorbed into CSU, the third and final Fenn College president, Dr. G. Brooks Earnest, said the University “will continue, as Fenn has in the past, to attract students of broad intellectual and cultural backgrounds, and to reach a goal of greatness toward which Fenn has always striven.”*

Carmen Adams '86, '92—assistant general counsel, Technology and Managed Services at Ernst & Young—graduated with a chemical engineering degree and later with a law degree from CSU.

Looking back to the 1980s when she commuted to the Fenn College of Engineering, Adams said her courses were practical albeit difficult. She met other students who shared her interests and were supportive. She participated in a co-op with Goodyear Tire and Rubber Company, then worked there after graduation, where she learned about patent law and decided to study it.

Adams said she was often the only African American in her engineering classes. “I think people are drawn toward people like themselves,” she said. “I think things are changing because the world is so diverse, and it’s easier to connect with people because of the technology that enables us to do that now. But back then, in the 1970s and '80s, it was kind of isolated, and I think it can still be that way.”

Schoephoerster said Washkewicz College is making efforts to recruit more African American and Hispanic students from the Cleveland Metropolitan School District and the city’s inner-ring suburbs.

The upcoming construction management program would ready students for an industry that is growing in part because of federal funding on infrastructure. “There’s

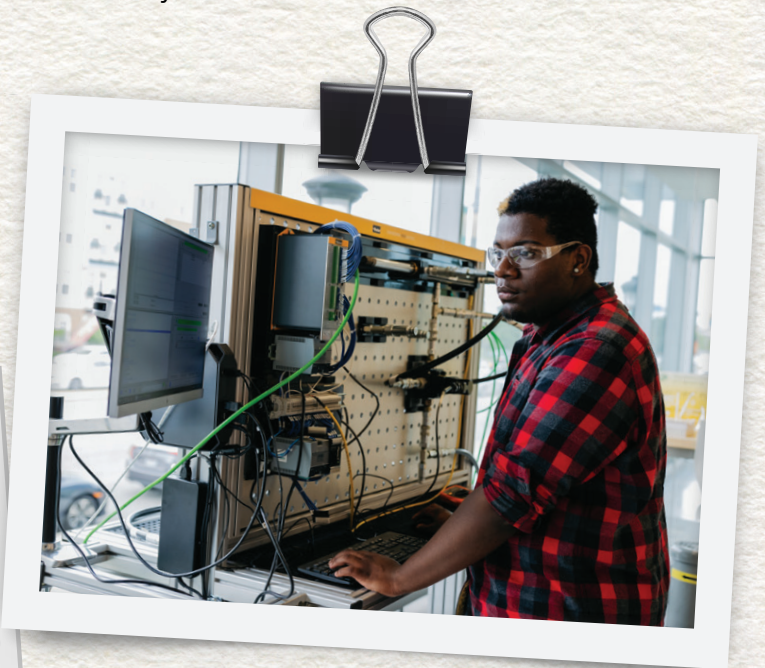
a strong desire from the industry to diversify the workforce, so we’re going to be working with them very closely to help them do that,” Schoephoerster said.

“We are an institution that believes in inclusive excellence,” said Sridhar. “We’re thinking of what kind of support we need to be providing to all students so that everybody can be successful. So, inclusion is a core tenet of how we do that.

“Different students have different kinds of needs. Some may have financial needs, some may have academic needs. It’s providing the right level of support so that every student that comes here has a sense of belonging and can thrive and succeed.”

Cleveland State Global, a collaboration between CSU and the firm Shorelight, recruits international students and provides them with admissions, academic, language and career support and services. Hizlan said many students from India study in the computer science master’s program.

The need for diversity in recruitment extends to faculty as well, Hizlan pointed out. “Any time there’s a new position that is coming up, that’s an important part of the hiring process, that we try to diversify faculty, be it gender or ethnicity or otherwise.”



Top: Student William Sweeney in Washkewicz Hall Parker Hannifin Motion Control Lab, 2023.

Left: Electrical Engineering laboratory in the newly remodeled Stilwell Hall, 1959.

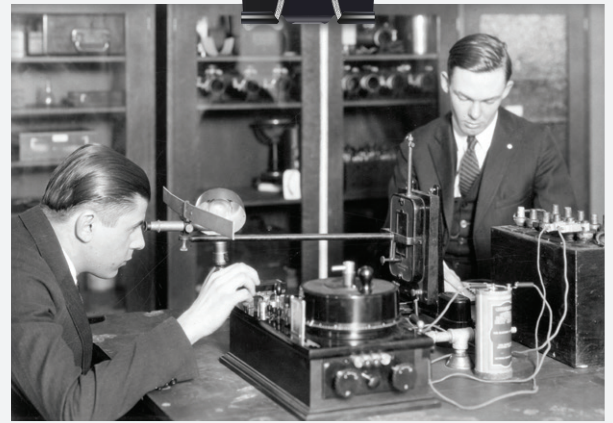
Engineering Integral to Fenn College and CSU

Fenn College was always known for engineering. When Dr. William Patterson joined the faculty as mathematics professor in 1936, math was housed in the engineering school because, as he put it, “we were predominantly an engineering school.” Patterson held numerous roles at Fenn and CSU, such as dean of engineering and provost.§

Fenn College metrics for engineering such as enrollment, graduation figures and co-op participation topped other programs for much of the college’s history. During World War II, the college offered engineering classes to U.S. military forces and defense contractors as faculty put their skills to war applications. The first computer purchased by the college in 1960 was mostly used by the engineering school.* G. Brooks Earnest, who served as Fenn’s president from 1952 to 1965, was a prominent Cleveland engineer who helped raise the college’s reputation, and CSU donated his portrait to the Cleveland Engineering Society.†

“This institution, particularly the College of Engineering, is incredibly important to the City of Cleveland and Northeast Ohio,” Sridhar said. “The number of folks that have had two, three, four generations of people go through an engineering education through Fenn College and what is now Washkewicz College is impressive, which is disproportional when you compare it to the rest of the University.”

Thinking back on her time at the Fenn College of Engineering, Adams cited the benefits of affordability and flexible scheduling. “The education at Cleveland State gave me a springboard to get where I am today,” she said.



The YMCA School of Technology’s Electrical Engineering Laboratory.

Holland, who joined the faculty in 2004, noted that he sees a high level of dedication in the Chemical and Biomedical Engineering Department. He echoed other department chairs when he said, “A department is really only as strong as its faculty members and the students who are supported through that. I think we have made a strong department with regards to the involvement of our faculty in research, outreach and their commitment to quality teaching and supporting our students.”

Michael Adams said he has witnessed the beautification of CSU’s campus since he joined the faculty in 2004. In addition to new green spaces and other colleges’ buildings, he pointed to Washkewicz Hall as a testament to the college’s importance to the University. “It really changed, I think, the way everybody internally felt about the college,” he said. “But also just externally, looking at that new building, that is a face to the world about what engineering means to CSU.”

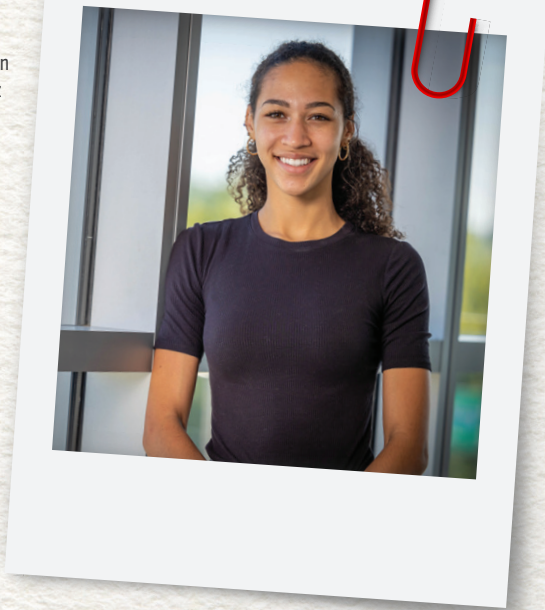
Throughout old and new spaces alike, Michael Adams said he regularly sees enterprising engineering students actively collaborating. “I feel very lucky to work at a place like this, because not everybody can get this excited about going to work,” he said.

Bloomberg spoke of the value of the Dan T. Moore MakerSpace in Washkewicz Hall, named after the Cleveland entrepreneur whose donation made it possible.

“I’m very proud of the MakerSpace—not just the MakerSpace but the MakerSpace orientation that you can take somebody whose preferred form of learning might be kinesthetic—I know what to do with a jigsaw and a hammer, but I don’t quite know what to do with a calculator’—and help them bridge that gap.”



Student
Madelyne Dunn
in Washkewicz
Hall, 2022.



Another new makerspace is under construction on the third floor of Fenn Hall, Hizlan said, adding that it will be largely used by electrical and computer engineering students but also open to others.

Overall, Duffy applauds Washkewicz’s current trajectory. “I’ve been here since the mid-’80s, and from the president on down to the dean’s office, we have some really good leadership on board—capable leadership, leadership that gets it,” he said.

With 100 years in the rearview since Fenn College’s founding, Schoephoerster posed some questions about Washkewicz College’s priorities: “As it evolves, what are the things that we want to maintain? What are the new things that are important now that maybe weren’t as important back then?”

Which new initiatives replace, improve upon or pay homage to Fenn College’s approaches and programs depend on CSU’s stakeholders—students, alumni, faculty and staff.

But one thing is for certain: “We don’t exist as a University if Fenn College didn’t exist first,” said Bloomberg.

* *G. Brooks Earnest’s “A History of Fenn College”;*
† *Interview with William Becker, former CSU Archivist;*
‡ *Cleveland State University Library’s “Fenn College”;*
§ *Recorded 2005 interview with William Patterson included in the Michael Schwartz Library’s Cleveland Memory Project*



Civil Engineering Professor Ernest Harris (1942–1967, BCE, 1939) supervises students in the Fenn Building Civil Engineering Laboratory



We don’t exist as a University if Fenn College didn’t exist first.

—President Laura Bloomberg



The number of folks that have had two, three, four generations of people go through an engineering education through Fenn College and what is now Washkewicz College is impressive, which is disproportional when you compare it to the rest of the University.

—Provost Nigamanth Sridhar

A TIMELINE OF **FENN COLLEGE** AND

1870

Cleveland YMCA begins offering free classes



1921

The educational program becomes the Cleveland YMCA School of Technology or "Y-Tech"

1927

Fenn College confers its first degrees to undergraduate and graduate business management students



1953

The college purchases the building that would become Stilwell Hall, then Fenn Hall, from the Ohio Motors Co.

1951

Fenn College and the Cleveland YMCA are legally separated, making Fenn a private college

1936

Fenn College and the Cleveland YMCA begin operating separately

1870s

1880s

1920s

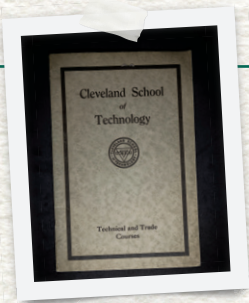
1930s

1940s

1950s

1881

Evening classes begin; a board of managers is created



1929/30

Over New Year's, Y-Tech is renamed Fenn College

1923

Y-Tech offers its first day classes for credit, establishes cooperative education program; given these developments, 1923 was later determined as the founding date of Fenn College

1940

Fenn College receives accreditation from the North Central Association of Colleges and Schools



1952

The Engineers' Council for Professional Development, now the Accreditation Board for Engineering and Technology, fully accredits Fenn College curricula in electrical, mechanical and metallurgical engineering; Selma Montasana is appointed as the college's first dean of women




CLEVELAND STATE UNIVERSITY



1964
Cleveland State University is established following the proposal of then-governor James Rhodes

1967

Fenn College graduates are awarded CSU degrees



1981
University Tower is renamed Rhodes Tower

2013


The Fenn College of Engineering is renamed the Washkewicz College of Engineering following a gift from Donald Washkewicz, then-president and CEO of Parker Hannifin, and his wife Pamela; Stilwell Hall is renamed Fenn Hall



1960
Fenn College purchases its first computer from Arthur G. McKee & Co., used primarily by the School of Engineering

1965
Cleveland State University opens with Fenn College as its “nucleus”; the School of Engineering is renamed the Fenn College of Engineering; the Fenn Educational Foundation is created to support higher education


1971
University Tower opens after three years of construction; the Fenn Educational Foundation becomes the Fenn Educational Fund of the Cleveland Foundation



1999

CSU transitions from a quarter to a semester system

2017
CSU dedicates Washkewicz Hall



Timeline: Fenn College information from G. Brooks Earnest’s “A History of Fenn College”; CSU information from webpages on csuohio.edu, clevelandhistorical.org and clevelandfoundation.org.



Don Washkewicz with former students, left to right: Christina Hope, Adefoyeke Elizabeth Akosile, Genaro DeMonte, Tim Szeltner, Don Washkewicz, Kyle Stephens, Megan Keleman

DONALD E. WASHKEWICZ '72

HONORED WITH THE

DISTINGUISHED ALUMNI AWARD

On the centennial of our engineering program, we thank Donald E. Washkewicz for his support and guidance as we honor him with the Distinguished Alumni Award.

The Washkewicz College of Engineering is honoring its namesake, Donald E. Washkewicz, with the Distinguished Alumni Award for lending his time, insights, expertise and financial resources to the college and to Cleveland State University.

“I am truly honored to present Don Washkewicz with the Distinguished Alumni Award on this centennial of our engineering institution,” said Dr. Richard Schoephoerster, college dean and biomedical engineering professor. “We have chosen the centennial of Fenn College to honor Don, as he has played a pivotal role in preparing us for the next 100 years of pioneering education, research and collaboration.”

At the time of Washkewicz Hall dedication, Don said,

My experience at CSU was so rewarding and I am forever grateful to the University and the people who helped me. At Parker, we have enjoyed a close relationship with the CSU engineering program that has yielded many new opportunities and enabled us to hire many very talented people. ***My hope is that the additional support we are providing will enable the CSU engineering program to do even more to make engineering a core driver of job growth and economic opportunity in the region.***

Education and Philanthropy

When Washkewicz attended Garfield Heights High School, his parents gave him the three career choices of doctor, lawyer or engineer and required that he attend CSU (Cleveland State University). His father, uncle and brother had all attended CSU's Fenn College of Engineering and he did the same.

Washkewicz earned his bachelor's degree in mechanical engineering from the Fenn College of Engineering in 1972, then received a master's degree in business administration from Case Western Reserve University. In that same year, he joined manufacturing titan Parker Hannifin Corporation, headquartered in Greater Cleveland, rising through the business and ultimately serving as its chairman of the board and chief executive officer. He retired in 2016.

In 2002, CSU honored Washkewicz with the George B. Davis Distinguished Alumni Award and in 2004 honored him with an honorary doctorate degree in engineering. Washkewicz contributed directly to his alma mater by funding improvements to the former Howe Mansion, now Parker Hannifin Hall and the Allen Theatre.

"After that, there was talk of expanding the college of engineering," Washkewicz said. "Since we hadn't done anything in a big way for the engineering college, I thought the time was right to do something for engineering. I felt it would be nice to give something back as the college was good to me and I learned a lot there."

In 2012, CSU honored Washkewicz with the President's Medal, the most prestigious non-academic recognition that the University confers.



Don and Pam Washkewicz at Washkewicz Hall ribbon cutting

A Decade of Successes

Given everything Donald Washkewicz has contributed to CSU, the University renamed the Fenn College of Engineering the Washkewicz College of Engineering in his honor in 2013.

Washkewicz and his wife, Pam, have graciously gifted \$10 million to CSU's engineering college, and additional monetary gifts from Parker Hannifin to match.

When the college was renamed, Washkewicz said: "My experience at CSU was so rewarding and I am forever grateful to the University and the people who helped me. At Parker, we have enjoyed a close relationship with the CSU engineering program that has yielded many new opportunities and enabled us to hire many very talented people. My hope is that the additional support we are providing will enable the CSU engineering program to do even more to make engineering a core driver of job growth and economic opportunity in the region."

Washkewicz spoke at the 2015 inaugural Senior Design Symposium and Awards Dinner, which has since become a staple of undergraduate education at Washkewicz College. At the event, he offered those seniors words of encouragement. "Cleveland State has taught you to think and use deductive logic—don't be concerned about not knowing everything as you embark on your careers."

In 2017, CSU dedicated Donald E. Washkewicz Hall, outfitted and equipped with cutting-edge engineering spaces and technologies.

In honor of the Washkewicz family's and Parker Hannifin's donations and offering of time and resources, the college dedicated the Parker Hannifin Motion and Control Lab, which trains students on motion and control technologies for aerospace, climate control and process control applications, and Parker Hannifin Classroom. Parker Hannifin signage stands in the hallway near the two rooms as a symbol of the business's continued contributions to the college.

Don and Pam Washkewicz continue to transform the lives of students through the Parker Hannifin Washkewicz Scholars Program, a full academic scholarship open to all CSU engineering students. They also assist students with the Parker Hannifin Summer School Scholarship and the Parker Hannifin Community College Transfer Scholarship.

Preparing for its next 100 years, the Washkewicz College of Engineering looks forward to achieving many more milestones—which will have certainly been made possible by the benefaction of Donald Washkewicz.



Associate Professor of Practice Bogdan Kozul and Don Washkewicz, Parker Hannifin Lab

Supporting COMMITTED STUDENTS

Katie and Brandon Davis share how the Katie D. Davis Engineering Scholarship awards students studying to begin fulfilling, in-demand careers.

Katie Davis '07, founder and owner of Erie Engineering and Construction and a CSU mechanical engineering graduate, said young people aren't always aware of opportunities in the field. They meet and speak with teachers and doctors but not often with engineers and technology professionals, who tend to work more in business-to-business settings.

"Somebody in high school will hear from their teacher, 'You should take up engineering. You're really good in math and science,'" Katie said. "But unless they have a family member who is an engineer, the question is, 'What does an engineer do?'"

That's one reason Katie and her husband Brandon created the Katie D. Davis Engineering Scholarship—to encourage students at Washkewicz College to discover the possibilities of engineering and to support those students as they manage tough classwork. Beginning in fall 2023, the \$12,500 scholarship will benefit students in good academic standing pursuing mechanical, electrical, civil or chemical engineering degrees.

When Katie studied engineering at CSU—which she said allowed her to creatively combine design with science and math—an academic scholarship helped her manage student loans.



Brandon and Katie Davis

And she demonstrates a profound success story. After developing and advancing skills in various engineering and construction roles ranging from chemical plants to government projects, Katie founded Erie Engineering and Construction in 2017. The company's team includes engineers in all the primary disciplines and partners with clients on entire building projects from pre-design to completion.

Lately, Katie has decided to increase her firm's focus on park and school projects, as well as other projects that protect Ohio's natural resources. One that is underway with the Ohio Department of Natural Resources is ahead of schedule and under budget renovation and replacement of state

park restrooms throughout Ohio. She also still continues to help industrial clients.

Brandon '03 is founder and president of NextStar, a company he uses as a platform for equity ownership and engagement with several businesses in the engineering, construction and manufacturing industries. He also serves in leadership roles on several boards and companies. Brandon holds multiple degrees, including a bachelor's in international relations and business from CSU.

Beginning in fall 2023, the
\$12,500 SCHOLARSHIP
will benefit students in good academic
standing pursuing mechanical, electrical,
civil or chemical engineering degrees.



Brandon and Katie Davis

“ BECAUSE THE TRUTH IS, WITH NEARLY EVERYTHING YOU SEE AROUND YOU IN THIS MODERN WORLD, AN ENGINEER PLAYED A PART IN MAKING IT. ”

—Katie D. Davis

In addition to the scholarship, Brandon and Katie offer internships and co-ops at their companies.

“One of the reasons—really, the only reason beyond supporting your family—to be successful is to be able to help others and give back, and help grow and build things,” Brandon said. “I have a philosophy for the past 20 years—‘Go Build.’ It is what I say a lot to all our teammates. We want to always add and make things better, or build, in everything that we touch, whether it’s our business, our teammates, our families, our communities. We want to build them up, so—Go Build.”

Katie is a self-described “STEMinist,” a term she heard while volunteering with the Girl Scouts. She said women approach problems differently than men, and her business website states that she brings “a bit of a ‘woman’s touch’ that appeared to be missing in the industry.”

“I think that the impact of having females on the team is to help bring a different perspective, and oftentimes females can more easily empathize with owners and clients. Empathizing and connecting with the client’s vision early on is beneficial to the entire team, because it helps the team

flush out issues and gain true alignment in the early phases of the project, which saves time, money and headaches in the long run,” she said.

Addressing engineering career opportunities, Brandon listed some of the myriad possibilities in construction alone. “You get to touch and see a lot of things,” he said. “You can go in a million different directions within the industry, whether it’s office buildings, or industrial or residential, or streets and highways, or sewage and water plants.”

Katie said she has been following developments at Washkewicz College and applauds the college’s contribution to the greater Cleveland economy.

“We have a very strong engineering corporate world here,” she said. “With more retiring, there is a shortage. So, there is more work than there are engineers currently. The future regionally seems very bright for young people interested in engineering.”

“As more engineering students graduate,” she said, “they will help this vibrant regional community. Because the truth is, with nearly everything you see around you in this modern world, an engineer played a part in making it.”

FORGING CONNECTIONS IN WORK AND LIFE

Edward Basta's '82 career embodies **leadership** and **excellence** in metallurgical engineering. Now semi-retired, he stays active with industry societies and has pledged to give back to his alma mater.

He's ensured the quality of gas pipes for city infrastructure, pipes for vehicles and heat exchangers for homes. He's testified as an expert witness in plaintiffs' lawsuits stemming from failed equipment and problems with materials. He lends his time and knowledge to non-profit engineering associations. So, one can take comfort in knowing that Edward Basta, driven by character and integrity, has helped build our world.

Basta started working at Republic Steel in 1973, where his boss encouraged him to pursue an engineering degree. Starting in 1975, he paid his way through night classes at CSU while raising a family and working full-time. In 1982, Basta graduated with CSU's last class of metallurgical engineering undergraduate students.

"Without that evening program at CSU, and fortunately my manager at Republic, I don't know where my career would have gone," Basta said. "I just owe truly all my professional career, in my opinion, to Cleveland State University."

Following those formative years, Basta brought quality and ethics to various jobs and gained expertise working with, he said, "castings, forgings, flat-rolled steel," among other technologies.

Then, from 2001 until his semi-retirement a few years ago, Basta ran his own engineering consulting firm, QTS. "I went into business and started doing failure analysis and production advisement of how to work with different materials—everything from steel to titanium to aluminum, even got into some plastics toward the end," he said. It was during that window that he also occasionally served as an expert witness in the courts.

Basta's commitment to engineering is exemplified by his volunteer service to non-profit engineering societies. He remains involved with The Engineering Honor Society, Tau Beta Pi (TBP), and The Materials Information Society, ASM International. His past organizational roles include association president and District 7 director of TBP, advisor to TBP's Ohio Epsilon chapter at CSU, and president of ASM International's hometown Cleveland Chapter.



Ed Basta, BSE '82

**ED IS A ROLE MODEL
IN TERMS OF WHAT
A GREAT ENGINEER
LOOKS LIKE, IN TERMS
OF COMMITMENT TO
THE PROFESSION,
THE IMPORTANCE
OF INTEGRITY AND
EXCELLENCE.**

—Curt Gomulinski, Director of Tau
Beta Pi Engineering Honor Society

In the late 1980s, after TBP's alumni chapter in Cleveland went inactive, Basta and a group of local alumni rechartered it as Ohio's North Coast Alumni Chapter. In 1995, Ohio's North Coast Alumni Chapter and three local collegiate chapters brought the society's annual convention to Cleveland for the first time since 1931. "They loved it," Basta said. "It was a great, great time."

At its 2023 convention in Atlanta, TBP will honor Basta's devotion and selflessness to the engineering field and to the organization with one of three 2023 Distinguished Alumni Awards.

TBP Executive Director Curt Gomulinski said Basta's dedication is "infectious," adding, "Ed is a role model in terms of what a great engineer looks like, in terms of commitment to the profession, the importance of integrity and excellence, and making sure you're always above board and really committed to what you're doing as a professional."

With characteristic generosity, Basta will donate estate funds to CSU, TBP and Catholic Charities Diocese of Cleveland. His bequest gift to CSU is earmarked for students raising families.

Basta follows the philosophy of "noblesse oblige," a french expression. "It's our job as people that are blessed with nice abilities to help those that may be less blessed or have less opportunities," he said.



Tau Beta Pi
The Engineering Honor Society



ON THE EDGE OF DISCOVERY

Washkewicz College and CSU are building up quantum computing research and education for scores of potential applications following the historic installation of a powerful system at the Cleveland Clinic.

The Washkewicz College of Engineering has joined yet another technological frontier, researching and providing education on quantum computing algorithms and software.

The college's new quantum computing research and education surround an IBM quantum computer that landed at the Cleveland Clinic in March 2023. Remarkably, the IBM Quantum System One installed at Cleveland Clinic's Lerner Research Institute is the first on-premise, private quantum computer in the U.S., and the first in the world dedicated to healthcare research.

"As a computer engineer by training myself, I was really fascinated with the new computing architecture," said Dr. Chansu Yu, professor of electrical and computer engineering at the Washkewicz College of Engineering, who coordinates a quantum computing group at CSU. "Quantum computing is an emerging and much more advanced form of computer architecture."

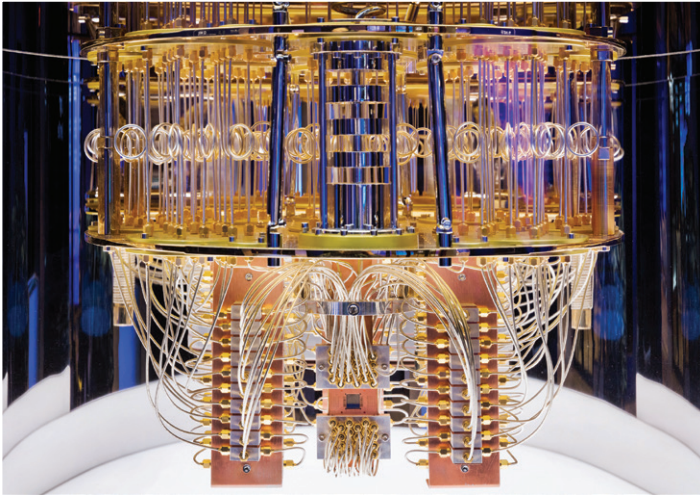
Quantum computers are based on quantum physics that take advantage of unconventional phenomena at the atomic and subatomic levels, which Yu said are not new fields of study. "Now, it is getting into the engineering side, which means that it is becoming controllable and practically useful in many different applications," he said.

Quantum computers use units called qubits to carry quantum information, according to IBM's website, instead of the bit system of zeroes and ones that traditional computers use.

"The algorithm speedup a quantum system can achieve is probably a million times or millions of millions times faster than what they are currently doing with a traditional supercomputer," Yu said. "So, it takes, let us say, a month to solve a computational task, but with a quantum system, you can do it in just a fraction of a second."



Chansu Yu Ph.D., Professor,
Electrical and Computer
Engineering



IBM Quantum System One unveiling at Cleveland Clinic's main campus and ribbon cutting ceremony by (left to right): Ruoyi Zhou, Ph.D.; Director of the IBM Discovery Accelerator at Cleveland Clinic; Cleveland Clinic Chief Research Information Officer Lara Jehi, M.D.; Congresswoman Shontel Brown; IBM Senior Vice President and Director of Research Dario Gil, Ph.D.; IBM Vice Chairman Gary Cohn; Lt. Governor of Ohio Jon Husted; Cleveland Clinic Chief Research and Academic Officer Serpil Erzurum, M.D.; ARPA-H Deputy Director Susan Monarez, Ph.D.; Cleveland Clinic CEO and President Tom Mihaljevic, M.D.; and Mayor of Cleveland Justin M. Bibb. Courtesy: Cleveland Clinic

“The Cleveland Clinic is definitely leading the way, because they house the 127-qubit IBM system in their facility,” Yu said. “And they are going to get a larger-scale, 1,121-qubit quantum computer from IBM in a couple of years.”

Washkewicz College of Engineering’s new Applied Data Science program is a joint Ph.D. program with Cleveland Clinic’s Lerner Research Institute, which began in fall 2023.

“The idea is that the student will take classes at CSU and they research at the Clinic under the supervision of Clinic staff, leading to collaborative research between CSU and the Clinic,” Yu said. “There are multiple subareas in that program, and one of them is quantum computing.”

In research, the National Science Foundation (NSF) has awarded a grant to Computer Science Associate Professor Dr. Sathish Kumar for a project that, per the award abstract, “aims to create and evaluate quantum and classical reinforcement learning-based agents for the optimal design of programmable quantum sensor circuit.”

And think tank New America has awarded a Public Interest Technology University Network grant to Information Systems assistant professor Dr. Charles McElroy. The grant is for an initiative to increase diversity, equity and inclusion in the talent pipeline so that Black, Hispanic and female students hold more than 60% of quantum computing internships at the Cleveland Clinic.

Overall, Yu said he believes CSU is making a large impact in quantum computing. “I’m very excited in the development at the Clinic and Cleveland as a whole,” he said. “This may be a once in a lifetime opportunity for Cleveland to become a preeminent hub for technology.”

The CSU departments currently involved in quantum computing initiatives include Electrical and Computer Engineering, Computer Science, Chemical and Biomedical Engineering, Math and Statistics, and Physics. Students and researchers are working with quantum computing algorithms and software that could lead to medical and cybersecurity breakthroughs, Yu said.

He said he envisions students will work at the three major hospital systems including the Cleveland Clinic, which are partners in the state-supported Cleveland Innovation District initiative, or financial institutions such as banks and insurance companies that use quantum systems or plan to use them in the future.

Yu coordinates a cross-listed class that began in fall 2022 called Special Topic in Quantum Computing, CIS492/CIS592. So far, students have utilized mainly simulators in labs. “Last year, for one lab, we used the real-life but small-scale IBM quantum system available in the cloud,” Yu said. He added that the class could use the Cleveland Clinic’s quantum computer for a lab as soon as fall 2023.

Alongside CSU, Case Western Reserve University and Kent State University are other regional Founding Quantum Members joining together for research and education alongside the Cleveland Clinic.

CLEVELAND INNOVATION DISTRICT AT CSU STRENGTHENS FOUNDATIONS IN MATHEMATICS



STEM Peer Teachers (Alfonso Santana, John Parker and Roshuela Laganzon) lead a math skills review session during the OpSTEM Summer Institute.

The Cleveland Innovation District (CID) launched in January 2021 and is in its third year of operation. The CID is a five-member consortium funded by JobsOhio, focused on making Northeast

Ohio more attractive to business and more competitive regionally, nationally and globally in the burgeoning healthcare and IT sectors.

The CID is composed of Cleveland State University, Cleveland Clinic, University Hospitals, The MetroHealth System and Case Western Reserve University.

CSU's commitment to the CID is to increase the number of undergraduate and graduate degree completions in life science and technology in the fields of chemical, biomedical, computer and software engineering; computer science, data science and information systems; and chemistry, biology, mathematics and statistics. These programs have been identified by JobsOhio as being most needed to contribute to economic development in the state of Ohio. CSU is also committed to increasing the number of workforce development certificates and internship and cooperative education opportunities.

In the first three years of the program, the CID has supported efforts to improve retention of students in STEM (Science, Technology, Engineering and Mathematics) fields at CSU. One of the programs receiving major funding is Operation STEM (OpSTEM), directed by Dr. Sara Froehlich, assistant professor of practice in the Mathematics and Statistics

Department, and coordinated by Juan Amador. The program's objective is to strengthen students' mathematics skills and increase pass rates in pre-calculus and calculus courses. OpSTEM is a companion program to the Louis Stokes Alliances for Minority Participation in STEM programs (LSAMP), funded by the National Science Foundation.

The OpSTEM/LSAMP programs start with a two-week Summer Institute prior to the start of fall semester. During the Summer Institute, the scholars become acquainted with CSU and resources, review essential mathematics skills, and build their social network with peers in their majors. In their fall and spring classes, the scholars are enrolled in pre-calculus and calculus sections which receive additional contact hours outside of class time, provided by STEM peer teachers (SPTs), who are undergraduate students who have excelled in their mathematics coursework. Since the SPTs are close in age and background to the students, they often help them learn the material in ways that resonate more closely with the students.

Results have been positive for the combined efforts of the STEM peer teachers, faculty and program staff. In summer 2022, 66 CSU freshmen participated in the OpSTEM/LSAMP program. Of the students enrolled in Calculus I that fall, the scholars passed the course at a rate of 84%, compared to non-scholars with a pass rate of 56%. The Pre-Calculus pass rate was 83%, compared to 70% for non-scholars. Support will continue for their spring semester calculus and pre-calculus courses.

These OpSTEM/LSAMP scholars are gaining strong foundations as they begin their academic programs at CSU, thanks to support from the CID.

Joanne M. Belovich, Ph.D.
Executive Director, Cleveland Innovation and
Professor, Chemical and Biomedical Engineering

FENN CO-OP PROGRAM

The Engineering and Computer Science Connections Fair is the Washkewicz College of Engineering's career fair held twice a year during the fall and spring semesters.

The fair provides an opportunity for employers to consider CSU students for co-ops, internships and permanent work opportunities.

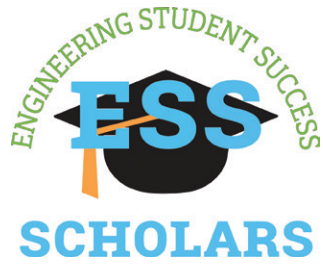
The 10th annual fall 2022 fair on September 30, 2022, was attended by 976 students and 130 companies and organizations. The spring February 23, 2023 fair was supported by 144 companies and 741 students attended.

Students were able to have their resumes reviewed, updated and printed onsite for sharing with prospective employers. This last fiscal year 164 students were placed with 142 companies with all majors represented.

Erin E. Elosh, M.S.M.
Senior Manager
Fenn Co-op Program



ENGINEERING STUDENT SUCCESS PROGRAM



The Engineering Student Success (ESS) Scholars Program of the Washkewicz College of Engineering is designed to support underrepresented minorities pursuing engineering, computer science and technology degrees. In

the 2022–2023 academic year, the fifth cohort was welcomed with 65 students.

The scholars engaged in workshops which focused on career fair preparation, study skills, scholarship essay writing and professional branding. Additionally, the scholars learned about the Fundamentals of Engineering Exam and had the privilege of meeting the Dean Richard Schoephoerster. The Lunch and Learn sessions have been

very successful. Six companies were invited to speak to students about the co-op and internship opportunities at their respective companies. Also, the Diversity in Engineering Networking Event was a success with 20 companies registered and more than 65 students in attendance.

The ESS Program welcomed 25 new students in our sixth cohort in fall 2023. This year, scholars will engage in workshops that will discuss dining etiquette, micro-internships and job negotiations, just to name a few. To date, the Engineering Student Success program has graduated 25 students who are gainfully employed or pursuing master's degrees.

Angela M. Benton-Smith, M.B.A.
ESS Program Manager
Engineering Diversity

THE FENN ACADEMY

The Fenn Academy visited advanced physics and advanced chemistry classes at 44 high schools and community colleges in the 2022–23 academic year, with an engaging presentation of engineering and computer science majors and careers. These presentations to many thousands of high-achieving, qualified students also built strong relationships with math and science teachers in our region and are the primary driver of campus visits and applicants. New undergraduate engineering enrollment saw a 13.2% increase in fall 2022. Daily visits are the primary reason for the large enrollment increase of new undergraduate engineering students.

The backbone of Fenn Academy student recruitment is the daily lab tours and college overviews that follow the Admissions campus tours. Three hundred sixty-two families and 11 high schools and community groups formally visited the college during this academic year. Additionally, the Fenn Academy supports all Admissions campus visit events including but not limited to summer, fall and spring Campus Visit Days, transfer visit events and new student orientations.

Northeast Ohio's premier engineering fair devoted exclusively to students interested in exploring biomedical engineering, Best Medicine, brings together the most talented and innovative students. This year, 54 students from 21 schools participated.

Hyland STEM Institute is a partnership between Hyland Software and the Fenn Academy. This week-long program is focused on increasing interest, persistence and success in high school math among first-generation, low-income, female and underrepresented minority students. Fifteen students participated in the institute in June.



In partnership with the Cleveland Engineering Society and the Fenn Co-op Program, the Fenn Academy coordinated an Engineer for a Day job shadowing program for 10th–12th graders. This event enabled 85 students to meet local engineers from 25 host companies in various engineering fields.

The Fenn Academy hosted the first Biomechanics Day at CSU when 40+ motivated students came to learn more about biomechanics from a 2021 Olympian, an orthopedic surgeon, the head trainer for the Cleveland Browns, CSU Ph.D. students and faculty, as well as CSU industry partners.

W.C. Vance, M.B.A.
Manager Student Programs
Assistant Director Fenn Academy

WASHKEWICZ COLLEGE OF ENGINEERING *FAST FACTS*

1/3

of all rehabilitation engineering grants funded by the National Science Foundation in the State of Ohio go to CSU

Biomedical Engineering makes up

39%

of doctorate graduates

largely, because of our partnership with the Cleveland Clinic

80-90%

of CSU patent disclosures and filings *originate* in the *Washkewicz College of Engineering*

57.5%

of *international CSU graduate students* are in the Washkewicz College of Engineering

HALF

of all students in the college are *Electrical Engineering and Computer Science majors*

Annual research expenditures *increased by*

10%

and has reached

\$3,137,090

In Fall 2023

Internally and externally supported graduate assistantships *reached*

\$2,000,000

20%

of engineering students are *female*

25%

of domestic engineering students are *underrepresented minorities*

SENIOR DESIGN 2023 INSPIRED SERIOUS REAL-WORLD SOLUTIONS

At the end of the 2023 academic year, the Washkewicz College of Engineering kicked off its pre-commencement activities with seniors exhibiting their Senior Design team projects. Thirty-two area organizations and Cleveland State University sponsored the 85 amazing projects that students completed during their intensive two-semester capstone. “We always have impressive showings at our annual Senior Design Symposium and Poster Competition, but this year was truly special,” said Dr. Michael L. Adams, chair and associate professor of the Engineering Technology Department and Senior Design Program director.

FIRST PLACE

PROJECT TITLE:

Autonomous Nursery Cart

TEAM MEMBERS:

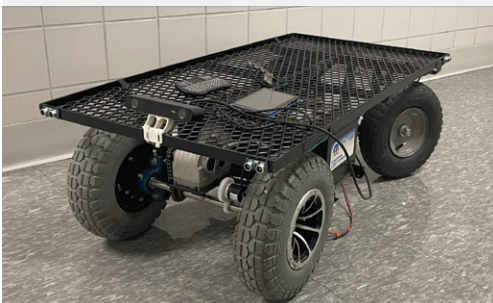
**Kenneth Bender, Russell Buttriss
and Shereen Elfadil**

FACULTY ADVISORS:

**Drs. Zhiqiang Gao, Qin Lin
and Hongkai Yu**

DEPARTMENT:

**Electrical and Computer
Engineering, and Computer
Science**



Pictured left to right: Dean Richard Schoephoerster, Kenneth Bender, Russell Buttriss, Shereen Elfadil and Dr. Zhiqiang Gao, senior design instructor.

“The first-place winner goes to team 132, Autonomous Nursery Cart,” Adams’ voice came through the loudspeakers of the Glasscock Ballroom in the CSU Student Center, which was packed with students and their families for the Senior Design Symposium.

This project started in the fall of 2021, when all three team members took the Signals and Systems class (now Design, Analysis and Simulation of Dynamic Systems) with Dr. Zhiqiang Gao, associate professor of the Electrical and Computer Engineering Department and director of the Center for Advanced Control.

The result was a cart that recognizes objects, human faces and movements, steers around corners and brakes as it follows workers around.

“It was a privilege to see the three of them put this together, from Ken’s term paper proposal in the fall of 2021 to the podium of Senior Design Symposium on May 5, 2023,” Gao said.

SECOND PLACE



Front row (left to right): Brian Gerhart, Kevin Minn, Leul Mezgebe, Prof. Toufik Aidja, faculty advisor; Back row (left to right): Andrew Zollos, Brian Dowhan, Ian Henning, Shakeeb Rahman

Soilless hydroponic technology can address food scarcity by reducing food miles, food deserts and soil erosion and degradation. With this in mind, the team designed a fully automated hydroponic vertical farming tower.

“Our Automated Hydroponic System project was indeed entrepreneurial in nature, as it aimed to offer a sustainable and efficient solution for urban agriculture,” shared Shakeeb Rahman, team lead, who thanked Rockwell Automation for its support.

Rahman said the Senior Design program was a “transformative experience,” adding, “The program allowed me to explore my passion for engineering and work with a fantastic team, while also giving me the opportunity to develop my entrepreneurial skills.”

Rahman will be working with Rockwell Automation as a Leadership Development Program associate in Product Engineering and Development.

PROJECT TITLE:

Automated Hydroponic System

TEAM MEMBERS:

Shakeeb Rahman, Andrew Zollos, Ian Hennings, Brian Dowhan, Kevin Minn and Leul Mezgebe

FACULTY ADVISOR:

Toufik Aidja

DEPARTMENT:

Engineering Technology

INDUSTRY SPONSOR:

Rockwell Automation



THIRD PLACE

PROJECT TITLE:

Real-Time Inline Quality Inspection System

TEAM MEMBERS:

Jake Szaniszlo, Darien Stanley and Alan Klosinski

FACULTY ADVISOR:

Bogdan Kozul

DEPARTMENT:

Mechanical Engineering

INDUSTRY SPONSOR:

Welsper Profile



Pictured left to right: Dean Richard Schoephoerster, Jake Szaniszlo, Darien Stanley, Alan Klosinski and Bogdan Kozul, assistant professor.

Working with Welsper Profile, the team engineered a system to identify and remove damaged steel roll-formed parts during production.

“Cleveland State’s engineering program provides all the resources and opportunities necessary to be a knowledgeable and successful professional,” said Jake Szaniszlo, team lead. “The engineering Senior Design capstone is a unique and invaluable experience that bridges the gap between classroom and experiential learning. It has aided in my personal development of technical and collaborative skills needed to be an effective project engineer.”

Szaniszlo will be working in Swagelok’s Engineering Career Development Program. He is also part of CSU’s 4+1 Accelerated Program and hopes to complete his MSME in the coming years while working full time.

HONORABLE MENTION

PROJECT TITLE:

SimSURROGATE Foot

TEAM MEMBERS:

Brandon Boettcher, Jaykumar Prajapati and Satnam Singh

FACULTY ADVISOR:

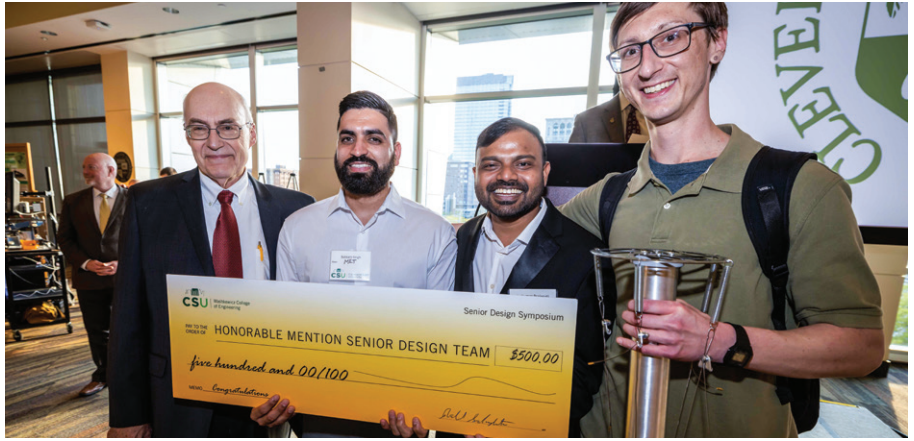
Dr. William Atherton

DEPARTMENT:

Engineering Technology

INDUSTRY SPONSOR:

Cleveland Clinic



Pictured left to right: Dr. William Atherton, associate college lecturer; Satnam Singh, Jaykumar Prajapati and Brandon (Bee) Boettcher.

Addressing a problem of research cadavers being expensive and having limited life span, these seniors created a convenient, repeatable and clean surrogate specimen.

“It was a lot of fun and inspiring to roll up our sleeves and get our hands dirty with a real-world problem that hadn't been solved yet,” said Brandon (Bee) Boettcher, team lead. “It was an honor to work with such an experienced and accomplished team at the Cleveland Clinic. Our biggest drive for this project was being able to apply the knowledge we've gained during our educational journey to make a meaningful contribution to the scientific and medical community.”



Summarizing the 2023 Senior Design Symposium and Poster Competition at large, Adams said: “Our seniors are the true showcase of this event, and they put on an impressive display of hands-on ingenuity. The quality of the finished work for many of the projects was well beyond our expectations, and the wide range of multi-disciplinary project ideas was astounding.”

Further, Adams stated: “The event itself ran without a hitch, largely due to the dedication and hard work of Tisha Barnes, who is our Engineering Technology Department and Senior Design Program administrative assistant. She was supported by the rest of the Washkewicz College of Engineering staff, as well as student employees. My heartfelt thanks to Tisha, the college staff and our students for such a wonderful event this year!”

We are also grateful for this year's sponsors:

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C&W

Cleveland State University —
Global

Dominion Energy Ohio

FirstEnergy Corp.

Great Lakes Cheese

Greater Cleveland Urban
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The Mortgage Collaborative

Virtec Enterprises

Welser Profile

Xadite

To learn more about the Senior Design capstone
visit engineering.csuohio.edu/seniordesign.

RECENTLY FUNDED EXTERNAL RESEARCH GRANTS TO THE WASHKEWICZ COLLEGE OF ENGINEERING



Dr. Qin Lin Awarded NSF Research Grant for Industrial Cybersecurity Incorporating Training of Students from Underrepresented Minorities

Dr. Qin Lin, an assistant professor in the Computer Science Department, has been awarded a two-year, \$200,000 grant by the National Science Foundation (NSF), funded by the NSF's Division of Electrical, Communication and Cyber Systems (ECCS). The project, titled "ERI: Operator-Automation Shared Protection for Security and Safety Assured Industrial Control Systems: Learning, Detection, and Recovery Control," aims to develop a comprehensive solution, integrating human-on-the-loop explainable machine learning (ML), detection, and recovery control in an operator-automation shared protection framework, to provide security and safety-assured ICSs against malicious cyber-attacks. The project will incorporate engineering research and education to train students, particularly those from under-represented minorities (URM), and cultivate a diverse, globally competitive cybersecurity workforce. With the goal of lowering barriers to ICS security research and education, this project aims to have a significant impact by providing accessible testbeds for a diverse population of beginning and expert cybersecurity students and engineers to learn and practice.



Dr. Tianyun Zhang, Received NSF Award from the Division of Computer and Network Systems (CNS) Grant for Edge Computing Research

Dr. Tianyun Zhang, an assistant professor in the Computer Science Department, has been awarded a two-year, \$174,233 grant from the National Science Foundation (NSF) for research on Edge Computing. Cloud-based computing can result in a lag while data is uploaded, processed and then communicated back. The project is titled, "A Systematic Multi-Task Learning Framework for Improving Deep Learning Efficiency on Edge Platforms." Multi-task learning is a subfield of machine learning in which a shared model is used to solve different tasks simultaneously. For example, there are multiple tasks to be done in real-time in self-driving cars, including object detection and depth estimation. If these tasks can be trained on a single model with shared parameters, the model size and the inference time can be significantly reduced. Zhang's project proposes an approach to learn the difficulty of every task and maintain the performance of the most difficult task when compressing a multi-task learning model. The research will include both undergraduate and graduate students and will generate research demonstrations that will engage K-12 students and help promote the pursuit of STEM-related careers.

Dr. Sathish Kumar Awarded DOE Award for Cutting-edge Scientific Machine Learning and Artificial Intelligence Technologies

Dr. Sathish Kumar, associate professor in the Computer Science Department received a \$600,000 one-year grant from the Department of Energy (DOE) for research regarding machine learning and artificial intelligence (AI). Specifically, his project, "Mobilizing the Emerging Diverse AI Talent (MEDAL) through Design and Automated Control of Autonomous Scientific Laboratories."

The mission of the MEDAL project is to conduct scientific and technical innovations for autonomy in scientific labs as well as train students in cutting-edge scientific machine learning and AI technologies. The objective also creates courses in scientific machine learning and contributes to advanced AI course topics such as explainability of deep learning models, robustness of deep neural networks and attention-based AI models such as transformers and perceivers.

The MEDAL project will provide AI education and training opportunities to diverse and underrepresented minority populations and promote DOE-relevant research by leveraging online learning and recent advances in large language models and other large pre-trained models for visual and scientific information.



Dr. Metin Uz was Recently Awarded a New NIDDK/National Institutes of Health (NIH) Stephen I. Katz Early-Stage Investigator Research Project Grant-R01



Dr. Metin Uz, assistant professor in Chemical and Biomedical Engineering Department and a consultant in Biomedical Engineering at Cleveland Clinic's Lerner Research Institute, was recently awarded an NIDDK/National Institutes of Health (NIH) Stephen I. Katz Early-Stage Investigator Research Project Grant-R01 providing \$2,339,409 in funding over five years for the project, "Wireless mechano-electrical stimulation of pudendal

nerve using piezoelectric platform for stress urinary incontinence." This funding will support his investigations on an innovatively engineered biodegradable and implantable device platform enabling local, wireless and postoperative mechano-electrical stimulation of the pelvic floor tissues. In this project, Uz will be collaborating with Dr. Margot Damaser from the Cleveland Clinic Lerner Research Institute and Dr. John Rogers from Northwestern.

Additionally, Uz and Dr. Hasan Erbil Abaci from Columbia University Dermatology Department recently received \$503,973 of funding for three years from NSF-Chemical, Bioengineering, Environmental and Transport Systems (CBET).



CSU Faculty Team, including Dr. Chandra Kothapalli, Awarded National Institute of Food and Agriculture Award to Improve Food Safety

Dr. Daniel Munther and Dr. Shawn Ryan, both associate professors in the Department of Mathematics and Statistics, and Dr. Chandra Kothapalli, a professor in the Department of Chemical and Biomedical Engineering, will lead a new research project to improve the safety of our food supply. The researchers have received a three-year, \$498,178 award from the National Institute of Food and Agriculture (NIFA), a federal agency in the U.S. Department of Agriculture (USDA), to support their work.



With New NSF Award, Dr. Hanz Richter Seeks to Revolutionize Control of Hybrid Powered Vehicles, Microgrids and Turboelectric Propulsion

Hanz Richter, Ph.D., a professor in the Department of Mechanical Engineering (MCE), has received a three-year grant of \$399,617 from the Dynamics and Control Division of the National Science Foundation (NSF) for the project, "Thermodynamics of Multi-Domain Power Networks: Principles for Optimization and Control with Applications to Turboelectric Systems." The research is based on a new, generalized understanding of principles from thermodynamics; in particular, its second law, entropy and energy. The research has applications in electrified aircraft propulsion, microgrids and electromechanical energy conversion. With this award, Richter will support Ph.D. students and mentor undergraduates in research. The group will extend the applicability of classical tools, such as entropy generation minimization to extended physical domains, with a focus on mechanical-electrical power conversion.

The U.S. Department of Education has awarded Dr. Yong Tao a grant to Develop Modeling and Simulation-Based Multidisciplinary Learning



Dr. Yong Tao, Betty L. Gordon Endowed Professor in the Mechanical Engineering Department was awarded a \$1,009,852 grant through the U.S. Department of Education from the Modeling and Simulation Program for his proposal, "Developing Modeling and Simulation-Based Multidisciplinary Learning Environment for Urban Universities." This project will be a collaboration between the departments of Mechanical Engineering, Electrical Engineering and Computer Science, and Teacher Education to develop a new graduate concentration of Modeling and Simulation in Sustainable Energy Systems (MS-SES). The goal of the project is to develop three new courses, deliver a flexible curriculum that fits student needs for a standard or accelerated master's degree, and develop a student-centered environment to recruit diverse students and enhance their success toward the MSP concentration, demonstrating career pathways.

Thank You

WE ARE GRATEFUL TO YOU,
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in gifts and pledges to the Washkewicz
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2023 (July 1, 2022–June 30, 2023).

Your generous support allows the college
to continue providing a high-quality,
affordable, experiential engineering
education, along with innovative
programming that helps our students
explore what is possible.

The list below gratefully acknowledges
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