

EDWARD F. CROSS SCHOOL OF ENGINEERING

# INNOVO

WALLA WALLA UNIVERSITY | FALL 2023



# DEAN'S MESSAGE

**T**he faculty of the Edward F. Cross School of Engineering at Walla Walla University are committed to teaching the fundamentals of the engineering profession and dedicated to the success of our students. Four core themes encapsulate the mission of Walla Walla University: excellence in thought, generosity in service, beauty in expression, and faith in God. You will notice echoes of these themes throughout the pages of this newsletter.

Dr. Louie Yaw provides a terrific example of excellence in thought. For a number of years, he has provided top notch instruction for students wanting to understand structural analysis and design. If you were to ask him what he has been working on lately, he will tell you about computational solid mechanics and his research project to write a journal article sharing recent advancements in computational models that he uses. These models use virtual element methods for elasticity and plasticity to solve structural mechanics problems.

Our students' commitment to showing generosity in service is perhaps most strongly seen in our Engineers Without Borders chapter, which is thriving. Dr. Natalie Smith-Gray, a recent addition to our faculty in the electrical and computer concentrations, has brought excellent energy to this club. You can read more about their recent work on page 6.

At Walla Walla University, our faculty and our students are committed to developing faith in God. Every week, the engineering teachers gather to strategize about goals and visions. The most important part of this meeting is in the first ten minutes, when we collectively reflect on a devotional thought and pray for specific prayer requests and praises, which often center on challenges our students face. You can read more about our focus on faith in God in the story about our student-led department vespers on page 4.

We are always excited to welcome students into our Christian community of excellent academics and commitment to service. Thank you for your continued support of the School of Engineering and the important work we are doing to prepare skilled and ethical engineering professionals for fulfilling careers.

Sincerely,

**Delvin Peterson**

*Dean and professor of engineering*

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@wallawallaengineering



# WWU SCHOOL OF ENGINEERING QUICK FACTS

**40,113**

Engineering credit hours have been taught in the past 10 years of our more than 75-year history of engineering excellence.

**18**

Engineering lab spaces on campus allow students to roll up their sleeves and discover what engineering is all about.

**95**

Collective years of engineering experience our current faculty has outside of academia mean students learn from experienced professors.

**>\$100K**

Engineering scholarships awarded to students each year, in addition to WWU scholarships.

**31**

Patents are held by our faculty.

**30**

Engineering students completed an engineering internship last summer, gaining valuable job experience.



For more than 75 years, the Edward F. Cross School of Engineering has prepared graduates for cutting-edge industries including aeronautics and space, bioengineering research, civil works, computer systems, power generation, and more. We are proud to continue this tradition of excellence through robust academic programs that include personalized attention from faculty, strong partnerships with employers, and our flourishing humanitarian engineering opportunities.



# SPIRITUAL COMMUNITY

FACULTY INTENTIONALLY INVEST  
IN STUDENTS, ACADEMICALLY  
AND SPIRITUALLY

Last school year, engineering faculty met to discuss how to further invite God into the engineering department with intentionality. This discussion led to the launch of weekly worship nights that include Bible study, worship, and genuine connections between students and faculty.



While Walla Walla University has a vibrant spiritual life with many programs that invest in students' faith, having a specific program for engineering students serves a special purpose. First, it allows students to build meaningful interpersonal connections outside of class. More importantly though, it serves as a reminder of the connection between faith and learning, and invites students to explore their faith in relationship to their engineering pursuits.

Janice McKenzie, professor of engineering, noted how important it is for students to know that their professors care not only about their academic lives, but also their spiritual lives: "Going to church and studying the Bible with our students show them that we care about their spiritual growth."

The new workshops have been a success. "It's been amazing!" said McKenzie. "The Lord has really blessed this ministry because it's something He wants to see."

# TOY HACK

ENGINEERING STUDENTS MODIFY TOYS  
FOR CHILDREN WITH DISABILITIES

**N**early every year since 2017, the Institute of Electronic Engineers Club and Education Club on campus have joined forces to carry out an adaptive toy program that makes toys more accessible for children with disabilities. A dozen toys are modified each year in Kretschmar Hall and are donated to children who need them through the WWU Center for Educational Equity and Diversity.

Brian Hartman, assistant professor of education and initiator of the adaptive toy program, said that while students of many different majors participate in the project, engineering students make up a large portion of the hackers. "The students love being involved in something that meets a real need," Hartman said.

The impact of the modified toys, constructed in a single afternoon of hacking, is very apparent. Most adapted toys on the market are very cost prohibitive for parents. According to therapists who participate in the program, having age-appropriate toys that support children's learning and therapy-goals can be life-changing. Therapists can request



toys for the children they work with and place them in toy libraries around the Pacific Northwest.

"Engineering students have been able to apply their skills to practical challenges through the toy hack," said Hartman. "It's one thing to learn the theoretical underpinnings of engineering in class, but it is so valuable for students to be able to use their knowledge to help others—allowing all kids to be able to have the toys they need."

# NEW LABS

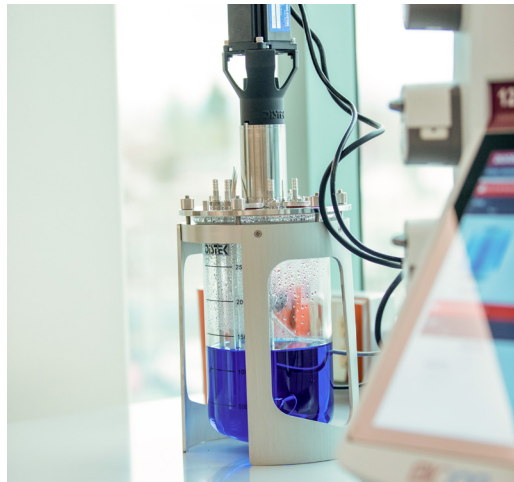
## RENOVATED BIOENGINEERING LABS EXPAND RESEARCH OPPORTUNITIES

**S**tudents are now actively learning in the School of Engineering's newly redesigned bioengineering labs. The updated space allows students from multiple majors to engage in sophisticated design and research initiatives, thanks to generous support from WWU alumni and the M. J. Murdock Charitable Trust.

Over \$700,000 was invested into the new laboratories, which boast key equipment including centrifuges, laminar flow hoods, microscopes, a spectrophotometer, incubators, an autoclave, and a bioreactor. In the sterile environment, students are able to work on

research in biomaterials, bioprocessing, and tissue engineering—industries that have all experienced substantial growth in recent years.

Janice McKenzie, associate professor of bioengineering, said that the new laboratories are substantially improving the research she does with students. The laboratories support study on topics not typically taught at the undergraduate level, such as aseptic mammalian cell culture, equipping students with skills highly sought after in the bioengineering industry.



# ENGINEERS WITHOUT BORDERS

## WWU CLUB MEMBERS FLEX ENGINEERING SKILLS THROUGH HUMANITARIAN WORK

**F**or more than eight years, engineering students at Walla Walla University have made an incredible impact through service locally and internationally as a part of Engineers Without Borders. EWB is a nationwide non-profit organization consisting of professional and student chapters that use their engineering skills to help communities in need. WWU's EWB club is an excellent opportunity for students to embody generosity in service and implement their engineering skills on projects with undeniable impact.

### **Connecting with local leaders in Eswatini**

In early September last year, club members and WWU employees traveled to the remote village of Manzini, Eswatini, to assess a potential new project site. In all their initiatives, the club seeks to prioritize connections with the local community first to fully understand their needs before developing solutions. If a site is selected,



projects conducted by the EWB club typically span multiple years with the hope that lasting solutions will be created that communities can sustain.

### **On-site at the Manda project**

Working on an EWB project is an invaluable experience for a resume, according to Shawn Rantung, a recent engineering graduate. Over the last two summers, two trips to Manda, Tanzania, have allowed students and faculty advisors to meet with local leadership and a partnering nonprofit, visit project sites, and evaluate existing infrastructure.

After finding that the needs of the community aligned with the skills of the club members, students began collecting large amounts of technical data to guide their work. EWB projects not only make a profound humanitarian impact, but also help the club members build marketable skills in the areas of teamwork and leadership. Each project is assigned a student leader who coordinates a plan of action and delegates tasks to team members.

### Closer to home

The EWB club implements projects both around the world and close to home. Last year, the club's local project focused on the Walla Walla Conservation District's efforts to repair and reinstall three flowmeters, which are used by local farmers to collect relevant data on water usage for reference and to report to local government.

When projects outlast a student's time at WWU, they are able to pass along their networks and skills to new club members to carry on the work.

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Discover a video about  
EWB's first trip to Manda  
by scanning the QR code.



# PEDRITO MAYNARD-ZHANG

## WWU ALUM HAS HONED SOFT SKILLS AND PURSUED VALUE-ALIGNED CAREER

In a world driven by innovation and technology, engineers and computer scientists have seemingly infinite career options in a variety of ever-evolving fields. Choosing a path may seem overwhelming or near impossible, perhaps even more so when your interests are as varied as teaching, social justice, and artificial intelligence. But for pedrito maynard-zhang\*, an electrical engineering graduate now working at Amazon Future Engineer, finding your space may be about personal values as much as it is about skillset.

### Discovering passions

maynard-zhang always considered himself a “left-brained person” who loved problem solving and the logic of math. In the ninth grade he discovered his true passion—computers. A self-taught coder, he was captivated by the limitless possibilities of technology.

It was an interesting conversation with a cousin working in the field of computer science that steered him toward an

undergraduate degree in electrical engineering. maynard-zhang hoped to gain a broad technical background while keeping his sights firmly set on a career in computer science.

Choosing Walla Walla University for his undergraduate education turned out to be a pivotal decision. The university’s strong engineering programs coupled with an emphasis on cross-discipline study and critical thinking equipped him with a solid academic base. He also formed close ties with respected professors that led the way to acceptance at Stanford, where he would go on to complete a master’s of science degree and doctorate in computer science.

It was also at WWU that he first practiced his love for teaching. Working as a tutor in the Student Development Center he discovered a love for helping students grasp challenging math, physics, and science concepts. “I’ve always had skills in listening and connecting with people, especially in a technical space. I really learned how to frame the work in a way

that made sense. It was so much fun,” recalls maynard-zhang.

### Aligning values with career

After completing his postgraduate studies focused on artificial intelligence, maynard-zhang thrived at teaching for several years, serving as a professor at Miami University. A desire to be closer to family brought him back to the West Coast, where he took the opportunity to dive into industry-level software development at Amazon and Microsoft.

After spending over 15 fulfilling but demanding years in artificial intelligence-related software development, increasing burnout prompted maynard-zhang to reevaluate his career trajectory. He realized that something important was missing, and he yearned to integrate social justice into his work. “Growing up in an Adventist family and subculture placed value on supporting the ‘least of these’. I have been very fortunate to find a lot of open doors in the world of computer science and technology. I feel a





great responsibility to let other kids have that experience,” explains maynard-zhang. This sense of responsibility became a driving force, urging him to explore opportunities at the intersection of computer science, education, and social justice.

At Amazon Future Engineer, maynard-zhang is part of a team dedicated to increasing access for all students to quality computer science education and career pathways, especially for students from underserved and underrepresented groups. As senior research scientist, it is his job to discover opportunities, set up ways to measure impact, and evaluate the team’s work. “I ask questions like, ‘Who are the students we should be focusing on? How is that different in different countries? What are the unique challenges and opportunities these students face, and how can we best support them?’” explains maynard-zhang.

maynard-zhang sees broadening access to tech not only as a moral imperative for fairness, but as a way to make technology more ethical. For example, with more diverse perspectives included in shaping the future of technology, he believes artificial intelligence could be less biased. In short, he’s using his skills to advance social justice through equitable technology education.

“I, like many in my field and related fields, often suffer from perfectionism. Striving for perfection can be powerful, but can also get in the way. I often remind myself, ‘It’s not perfect but there’s progress, I’m persisting, and that’s worth celebrating.’ What matters most is progress toward meaningful goals. And if you center relationships with your customers, team, managers, whoever you’re impacting, this will generally point you toward the right goals.”

\*maynard-zhang uses lower case for his name as a humility and human solidarity practice.

# AMANDA MARX

## WWU ALUMNA CHARTS LUNAR MISSIONS AS ISPACE ENGINEER

**A**manda Marx realized at a young age that her strengths were in the areas of science and engineering. She developed a desire to help advance the world through science, technology, engineering, and math (STEM) despite not having any family who had taken a similar path. Years later at Walla Walla University, Marx chose to major in mechanical engineering, not knowing that her undergraduate education would prepare her for a fascinating career in aerospace.

Marx is grateful for the small class sizes she enjoyed at WWU and the relationships she developed with her professors. She particularly enjoyed the many math classes she took from Benjamin Jackson, professor of mathematics. When it was time to apply for graduate school, she was able to bring strong letters of recommendation and secured a spot at the University of Colorado Boulder for her master's degree.

Transitioning from mechanical engineering to aerospace challenged Marx to expand her skillset, but the hard work remained doable because she was so passionate about the work. Though she was nervous about whether her mechanical engineering skills would transfer

*"Don't be afraid to go after the path that interests you because you will never feel completely ready."*

over into aerospace, Marx wasn't afraid to take the leap. As soon as she became immersed in the new field, she knew it was the right place for her.

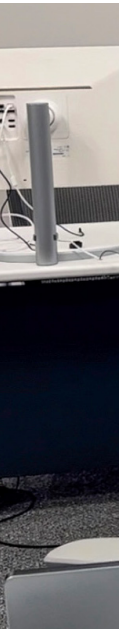
ispace, a small aerospace start-up, was her next step after earning her master's. Located in Colorado, the company was near the University of Colorado and, importantly, within close distance of many outdoor activities. Marx was thrilled to be one of the first 20 employees at the company's United States office. "It was incredible to be involved in the first big contract our company made," said Marx. "It gave me a new perspective on the impact of our work."

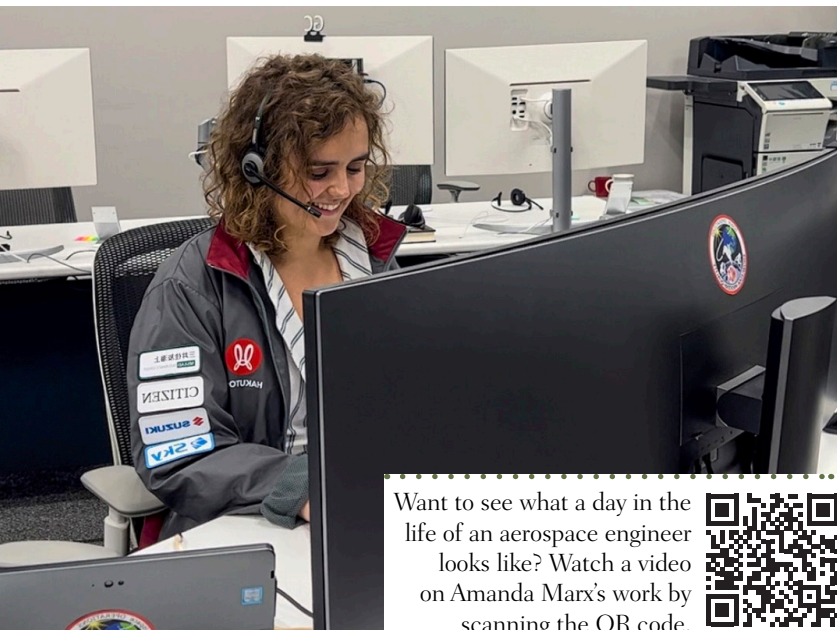
At ispace, Marx specializes in planning and designing spacecraft trajectories for lunar missions. "The moon is a hot topic right now in

our industry," Marx said. "Almost all missions have to pass by the moon on their way to other destinations, and there is interest in using the moon as a station for refueling." One of Marx's favorite things about trajectory design is that it requires the use of her artistic skills and creativity when she must prove the rationale of her designs.

Marx is particularly proud of the four months she spent living in Tokyo planning maneuvers for a spacecraft mission attempting to be the first commercial company to land on the moon. She felt honored to be part of a group of people from around the world who shared her interests. Marx has her eyes set on many even bigger goals for the future. In addition to seeing a couple of lunar lander missions through, she wants to work on an interplanetary mission and even participate in a mission to the outer edge of the solar system.

From her time in the WWU School of Engineering to her fast-paced career in the space industry, Marx has been inspired to chase her goals countless times along the way. "Don't be afraid to go after the path that interests you because you will never feel completely ready," Marx said when asked to share her best advice. "Do your research and go for it."





Want to see what a day in the life of an aerospace engineer looks like? Watch a video on Amanda Marx's work by scanning the QR code.



*This photo was taken by ispace spacecraft during a solar eclipse on April 20. The moon's shadow is visible on Earth's surface.*



# COLLOQUIUMS WE ENJOYED

Distinguished alumni and guests enrich our program each year by sharing their life experiences in our colloquium series. We are always looking for presenters, so if you would be willing, please email us at [engineering@wallawalla.edu](mailto:engineering@wallawalla.edu).

**Lance Doyle**

*Pacific Northwest National Lab  
in Richland*

Seeing real projects from concept to production: defining hardware and software based on how many units will be produced.

**Engineering Without Borders updates**

Reports on the progress of various EWB projects shared by club members.

**Serena Van Fossen**

*Junior engineering student*

Discussion about the impact of differing worldviews on engineering solutions.

**Devin Reck**

*WSDOT Southwest Region*

Insight into experiences with the Washington State Department of Transportation and ways students can connect with opportunities.

**Michael Showalter**

*SimuTech Group*

Exploration and examples of Computational Fluid Dynamics (CFD) in automotive, aerospace, civil, electrical, and bioengineering.

**Khalid Sorensen**

*Finity Engineering*

An unexpected and fortuitous journey from WWU engineering graduate to technology entrepreneur.

**Robert B. Turner**

*Spokane Public Schools*

Real experiences in a case study format for students to consider how they might ethically respond.

**Dennis Vories**

*Technidea*

Finding the keys to a happy, successful career in engineering.

**Troy Walker**

*Affinity Imports*

Using engineering skills to solve problems as a business owner.

**WWU student interns**

Panel discussion on obtaining and getting the most out of an engineering internship.

# RICHMAN SIANSMBI

## ENGINEERING GRADUATE OWNS A SUCCESSFUL COMPANY

“I was born in Zambia, Africa. I came from a poor family where, and although we didn’t struggle to eat food, I was disadvantaged. I did not even know how to use a computer. There weren’t computers at the school I attended. But I was determined, and I came here.”

Richman Siansmbi’s graduation as a mechanical engineer from WWU was made possible by the generous support of two donors and a scholarship through Ford Motor Company. “Without that support, I would not have made it through college,” reflects Siansmbi. His chance to study engineering in the United States would not have been feasible without this opportunity, so he was determined to seize it.

And seize it he did. Siansmbi now works as the owner and founder of Digital Scan 3D, a successful engineering consulting company that provides 3D scanning and training to a variety of companies. His team provides clients with access to highly accurate 3D scans used

primarily for quality assurance and reverse engineering. With offices in both Portland and Seattle, Digital Scan 3D has done work with Boeing, Intel, Nike, Ford, General Motor Company, and others.

Siansmbi’s successes come after a lot of dedicated effort. As a business owner, he has learned a lot of customer relation and business skills, expanding his abilities beyond technical knowledge. Even before founding Digital Scan 3D, he worked hard in his years post-graduation; at times working two full-time jobs plus conducting his own research for what would become Digital Scan 3D.

In some ways this grit was developed during his time at WWU. Siansmbi admits that the significant financial support he received was a miracle, however, the challenges he faced did not end upon enrollment. In university, he was committed to making the most of his opportunity, despite not having the basic technical background many other students had.



Siansmbi believes WWU is the perfect place for students to go the extra mile and take advantage of all the opportunities an excellent education offers—research projects, internships, and access to technology. The School of Engineering provides students a chance to master the skill of working on a team; an ability that Siansmbi believes is one of the best predictors of success in the engineering field.

Siansmbi encourages current students, “I think most people have the potential, and if they are determined and have a goal, I think it’s achievable through God’s help. If they put in their time and they are honest and faithful, I believe that anything is possible.”

# NEW ENGINEERING FACULTY

**Eduardo Ribeiro** earned his Ph.D. from the Federal University of Parana in 2016. His mission in teaching is to share his extensive professional experience in an applicable and relevant fashion.

Eduardo Ribeiro, professor of engineering, is grateful to have witnessed God's guidance in his decision to teach at Walla Walla University. Motivated by the idea of working for a Seventh-day Adventist university recognized for its quality education in science, technology, engineering, and mathematics (STEM), Ribeiro felt called to teach in order to

share his professional experience in a relevant and applicable manner.

Ribeiro became the founder and a partner of DYN Technologies after earning his bachelor's degree from the Federal University of Parana in 2010. After returning to the university to earn his doctor of philosophy degree, Ribeiro

completed extensive research in structural mechanics and, more precisely, vibration analysis and control of structures.

Ribeiro's favorite activities outside of the classroom include spending time with his family, reading, swimming, hiking, and mountain biking.

**Natalie Smith-Gray** earned her Ph.D. from Washington State University in 2022. Her graduate research provided promising solutions to combating environmental pollution caused by nuclear waste.

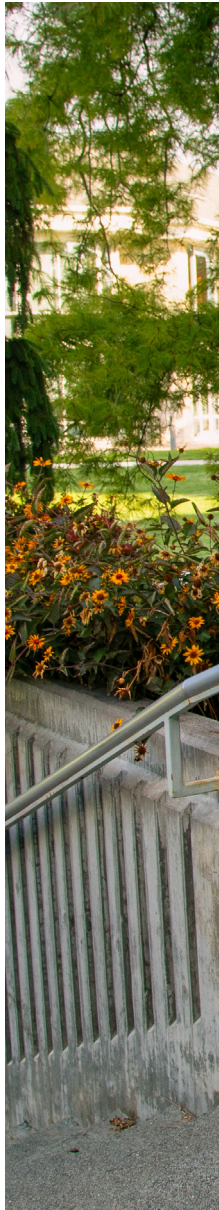
Natalie Smith-Gray, professor of engineering, graduated with a bachelor's degree in engineering from WWU in 2018 and completed her doctor of philosophy degree at Washington State University before returning to WWU as a professor. Her teaching areas include circuit analysis, fundamentals of programming, and data science.

Inspired by a hope to explore a viable option for reducing nuclear pollution, Smith-Gray's graduate research examined how vitrification—the process of turning nuclear waste into glass—can successfully reduce harmful quantities of nuclear waste in the environment.

Smith-Gray contributes professionally to a number of organizations outside of her

teaching at WWU including the American Society of Engineering Educators (ASEE), the American Ceramic Society (ACerS), and Engineers Without Borders (EWB).

She enjoys hiking, learning languages, flying small aircraft, and traveling.





## FACULTY

**Delvin Peterson, Ph.D., PE**

Dean and professor  
of engineering

**Bryce Cole, Ph.D., PE**

Associate dean and professor  
of engineering

**Rob Frohne, Ph.D., PE**

Professor of engineering

**Mark Haun, Ph.D.**

Associate professor  
of engineering

**Qin Ma, Ph.D.**

Professor of engineering

**Janice McKenzie, Ph.D.**

Associate professor  
of engineering

**Eduardo Ribeiro, Ph.D.**

Associate professor  
of engineering

**Natalie Smith-Gray, Ph.D.**

Associate professor  
of engineering

**Ralph Stirling, M.S.E.E.**

Project engineer

**Doug Thomsen, Ph.D.**

Professor of engineering

**Melodie Williams, M.S.C.E., PE**

Professor of engineering

**Louie Yaw, Ph.D., PE, SE**

Professor of engineering



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## SUPPORT WWU ENGINEERING.

Alumni contribute to our program in many amazing ways. If you would like to support our students and their success here at WWU, email us at [engineering@wallawalla.edu](mailto:engineering@wallawalla.edu). We are currently accepting applications for advisory board member positions. Alumni enrich our curriculum through classroom presentations and we also accept donations for student scholarships and lab equipment. Your job and internship opportunities contribute to the professional growth of our students. We welcome your partnership as we prepare students for careers of distinction and a lifestyle of service.

