Featured Alumna: Emily BUERGLER, Class of 2016

NASA Flight Software Engineer **Emily BUERGLER '16** landed in the Upper School on May 5, 2023, to speak to her Sacred Heart Sisters about her journey from 10202 Memorial Drive to space. The guest lecture was organized by Upper School Computer Science and Engineering teacher Zachary Cavanaugh, also the moderator for Duchesne's Iron Plaid robotics team, which Emily joined her junior year.

Two years prior, as a Duchesne freshman, Emily had taught herself C/C++, the same programming language used to compute robots, and GameMaker, the programming language used for videogames. It was a skill born of chance: the school's firewall had blocked most games Emily and her peers could play on their laptops; Emily decided to make her own. Her first attempt, "Halloween Game," (so-called because she intended to have it ready to play by the holiday) took over a year to create. It was observing her Geography teacher interact with the game, coupled with a segment of the class on Boolean algebra, that finally made everything "click." Emily transferred the Boolean logic of "if-statements" to her program, and "Halloween Game" went on to win a Silver Key award in the videogames category of the 2014 Scholastic Art & Writing contest, the first year the contest accepted videogame submissions. "It was that tiny part of [the Geography] class that made me learn how to program possible."

At the time, the idea of translating her new hobby into a career path had not crossed Emily's mind. "I liked programming but thought maybe I'd do code monkey stuff like web development."

"I completely lucked into my career," Emily explains. "Just totally by accident talked to a company at a career fair and that set my path on a totally different trajectory." That career

fair was the 2016 Fall Engineering Expo at the University of Texas at Austin, intended, traditionally, for upperclassmen. Emily was a freshman at the time, and her chances of securing a summer internship were slim, but ultimately successful. Emily connected with CACI, a private contractor that works with NASA on human spaceflight. She worked two summers with CACI before interning directly with NASA in the Pathways Co-op program, programming real flight software for the Artemis I launch.

Emily earned her Bachelor of Science in Electrical and Computer Engineering with a specialization in Computer Architecture and Embedded Systems, in 2021. She now works full-time with NASA at the Johnson Space Center in the Moon to Mars program. Her concentration is Gateway, the future space station that will orbit the moon. Within Gateway, Emily programs the software for the Vehicle Systems Manager, or VSM, Gateway's "brain." Her background in robotics proved to be useful as the program is written mostly in C and some C++. In the future, Emily strives to one day lead her own team within NASA. She hopes her story "encourages more girls to consider careers in engineering… to think bigger."

Emily's presentation is available here, and Halloween Game can be played here.

Would you say Iron Plaid was a catalyst in pursuing programming in college?

Yes! Most definitely. It turns out that C++* is used a lot in industry too, which is why it was fortunate that this ended up being one of the programming languages I was the most comfortable in. By the time I had to take classes in C++, I found these to be a breeze. When picking a college major, I knew I wanted to do programming, I just was not sure if that meant I should pick Computer Science or Computer Engineering. I was originally going to pick Computer Science, but my parents convinced me to take Computer Engineering instead. I'm glad I took it because I developed extra resiliency through the demanding coursework which I think will serve me well in the long run, and I was more than prepared for my career.

**The language used in robotics*

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Your career has taken some unexpected pivots, how do you recognize opportunities and face setbacks that have come up along the way?

I take the pivots the only way such things can be taken – one day at a time. Although I always like to be on the lookout for new opportunities, some things cannot be foreseen, such as running into a NASA contractor at my college career fair. I've learned to entrust such big things to God. He has a plan and is working all things for my good. The key is to make sure you are ready for whenever opportunity does come, having your wings raised so you can take off and fly when the breeze does blow your way. For me, meeting the NASA contractor was a huge stroke of luck yes, but that wasn't the only thing. I also had my programming skills and projects (such as robotics) that I could tell the recruiter about, as well as my obvious interest in space and software development in general. All these things are important, both knowing what you are interested in and working towards those interests, so that you not only recognize the opportunity but can leverage it, too.

What wisdom would you share with your younger self?

When I was in high school, I was very anxious about how things would turn out. Even though I was a good student, it was something of a rat race to get into the good colleges because I wanted all the opportunities I could get so I could pick the best one for myself. Add to that the pressure to fit in with my peer group, and it was a lot to take in. I wanted to be perfect at everything. I think one thing I would tell my younger self is that things get a lot better in college and beyond. I got a lot more freedom in college because the class sizes are huge, and then a lot more free time after college as an adult because after school you no longer have to compete against your peers for the best grades or stay up late studying for tests. Being an adult is a lot more chill. I think knowing that would have given me more hope and the resiliency to keep going – the work is 100% worth it in the end.

By Sophia Rivera, Class of 2024