

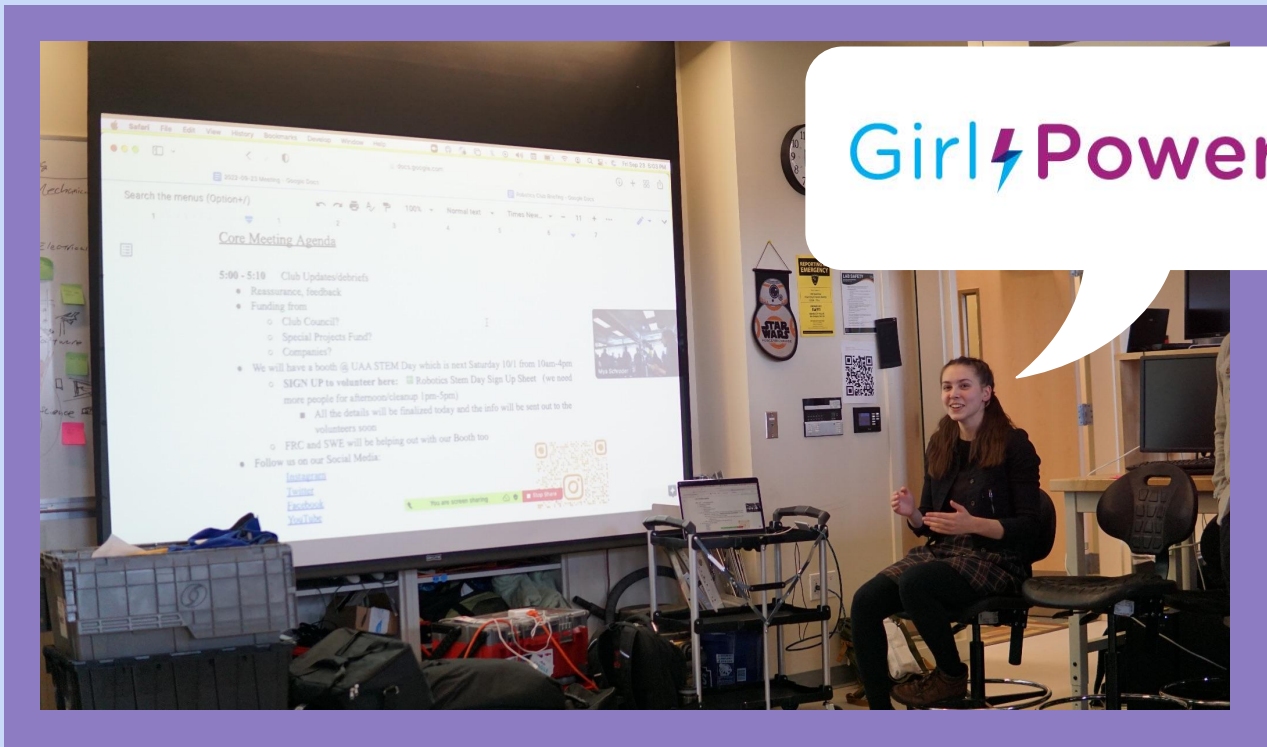
Created by Mya and Eleonora

Girl Powered



We are the UAA Robotics Team in
Anchorage, Alaska
VEX Team ICE1





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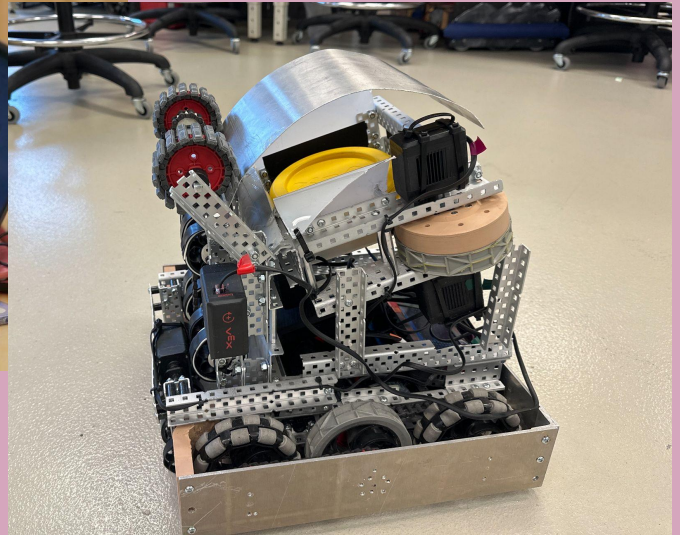
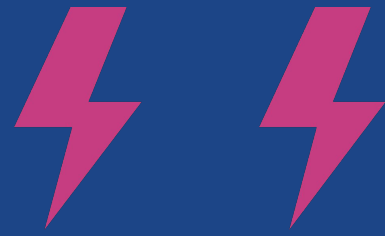
GIRL POWERED

The term “girl power”, despite its occasional use as a slogan to make fun of girls and women (girlboss, anyone?), actually represents the **hope and struggle for female empowerment**; that girls may grow up with a **natural belief in themselves and their abilities and their right to be in the same space as guys**. For our Robotics Club at University of Alaska Anchorage, which is quite literally “girl powered”, it also means that girls and women are the **driving forces behind our robotics team**.

Our club president, **Mya**, took it upon herself to revive the rapidly dwindling interest in Robotics at the university, recruiting over 20 new members to the team for the 2022 fall semester, and has led us in participating in our first VEX U competition. Apart from being in charge of most administrative, funding, and outreach aspects of the club, she also works with CAD, on the building and programming of the robot, and creating a full-stack web-app for our Robotics club.

Devin is one of our mechanical team leads, and spends many hours creating CAD designs for the robot that are the basis for the design process, as well as assembling the robot. She unites the mechanical members of our team to build the best robot possible for the VEX Spin Up challenge. **Eleonora**, our Organization Lead, is heavily involved with writing the C++ code that will operate the robot in both the manual and the automation phase of the competition, but also secures funding for the team and works on the team’s website.



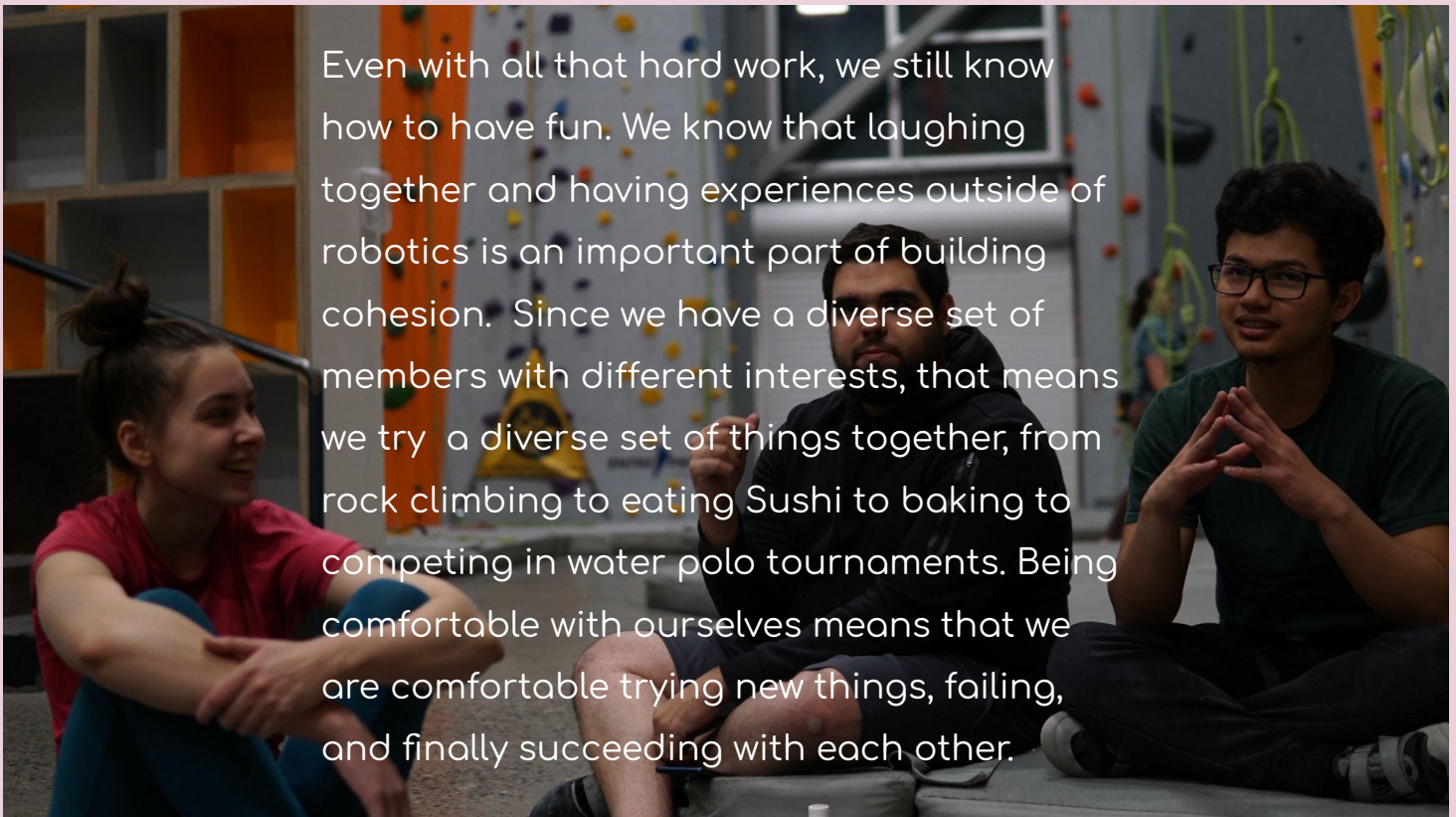


Our robotics club is quite large, so Mya has implemented a task based approach instead of a team-based one, which means that ongoing tasks are posted continuously and **anyone is welcome to collaborate on them**. This also ensures that we are using our team's time effectively: team members can come to our weekly meetings, help complete a specific task, and know that they had a **direct impact on the team's progress**. With the way we have decided to approach the VEX U Spin Up competition, we **may choose to focus on one aspect of the process** (design, building, programming, driving, funding, outreach and so forth), **but are not restricted to that discipline**.

For example, we have team members who hop from funding tasks to mechanical tasks to programming tasks, which means at some point we all get to work with CAD, write C++, do 3D-printing, assemble the VEX parts, operate the tools and machines in our lab, and more. This approach is what makes our team truly **interdisciplinary**, and allows everyone to **contribute their perspective** to the different parts of the process that go into creating the robot. The baseline is that **everyone on the team is equal**, which encourages the women (and others) to try new disciplines, explore different roles, and broaden their knowledge.

ENCOURAGING DIVERSITY

Diversity of gender, background, race, and more results in a **diversity of thought**. That inherently leads to a diverse set of ideas, meaning we are more likely to find the best solution for any problems we face. To ensure that **all ideas are brought to the table**, we make sure to never “trash talk” a so-called “bad” idea. Everyone, regardless of their gender or background, deserves an **equal voice**. As such, we’ve had a solid team chemistry from the get-go. We work hard together, sometimes long into the night. We all try to encourage each other to try new things and be a better version of ourselves.



Even with all that hard work, we still know how to have fun. We know that laughing together and having experiences outside of robotics is an important part of building cohesion. Since we have a diverse set of members with different interests, that means we try a diverse set of things together, from rock climbing to eating Sushi to baking to competing in water polo tournaments. Being comfortable with ourselves means that we are comfortable trying new things, failing, and finally succeeding with each other.

We know that **having a diverse team is directly correlated to the success of the team**. We encourage diversity by having an inclusive, comfortable, and collaborative environment. Because we are a relatively large team, this is something we actively have to work at. When new members come to our meetings, we make sure to talk with them, and make them feel included as much as possible. We love to get them involved with tasks as soon as possible so they feel like they are part of the team. Our worst fear is that someone feels uninvited and never comes back to a team meeting because of that, so we are **always open to feedback on how to make the team more inclusive** and have an anonymous feedback form continuously available for anyone to fill out online. **Our goal is to be better than we were yesterday.**

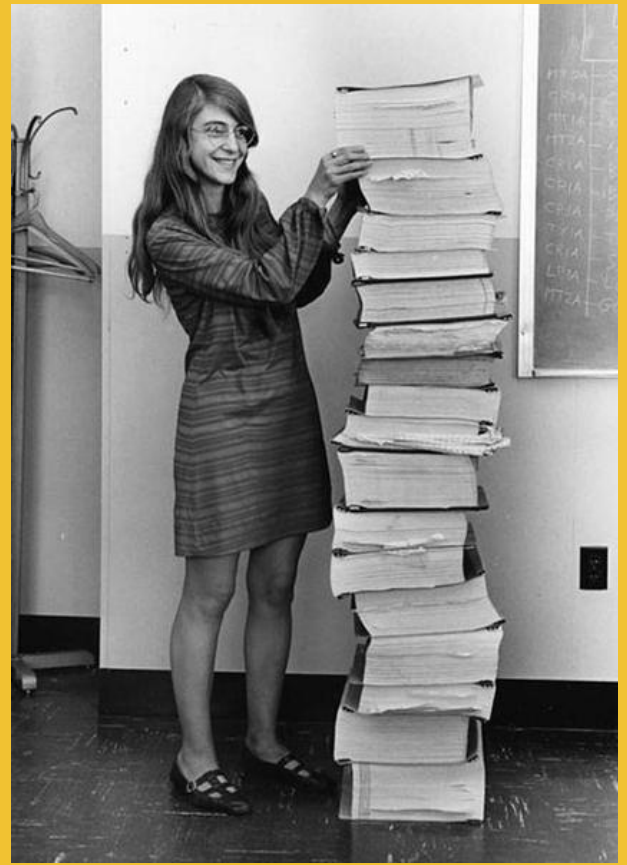
STEM ROLE MODEL

On our team, there are many roles that come together to allow our robots to function. One of the critical aspects of the robot is software. The words “**software engineer**” come with a lot of prestige nowadays. But that was not always the case. This term was coined by **Margaret Hamilton** in the 1960s when she was the head of the team of about 100 MIT programmers that developed the **in-flight software** that allowed Apollo 11 (and future missions) to land on the moon for the first time in 1969. At that time, programming was not taken as seriously as other engineering disciplines. However, through her work on the Apollo Project, she proved that **software deserves to be considered an engineering discipline** just as much as all the other ones.

“THERE WAS NO CHOICE
BUT TO BE PIONEERS”

Girl⚡Powered

“PART IS REALIZED AS
SOFTWARE, PART IS
PEOPLEWARE, PART IS
HARDWARE”



She worked to make the Apollo Software ultra-reliable, allowing it to overcome unexpected problems and recover from errors. Her work **set the standard for software quality and risk management**. She said that *“it is better to define your system up front to minimize errors, rather than producing a bunch of code that then has to be corrected with patches on patches”*. Hamilton’s work inspires us to raise our standards for robot design and software, making sure to design integrated systems that will not fail at critical times during competition. She’s an excellent role model because she encapsulates what it means to be a strong female leader who thought outside the box and made a real difference in technology. She shows that having a **diverse set of leaders** is of the utmost importance for a successful project.

OUTREACH

We understand that the first step to bringing a larger diverse set of people onto the team is outreaching to the community. We love to participate in **local community events** and bring our robots for youth and adults to interact with. When we go to those events, we try to make sure to bring some female members from our team so that younger girls who interact with our booth see that **women belong in robotics and engineering** too. We want everyone to be able to picture themselves thriving in STEM.



Additionally, we believe the best way to become interested in STEM is to have hands-on experience with it. That's why we partner with the UAA Society of Women Engineers to host free **STEM workshops** open to the entire UAA community. Workshops this year included topics such as **soldering and 3D printing**, where we helped provide materials and instructors. We hope to give college students technical skills that make them enjoy STEM, while at the same time showing them that women are an **integral part** of engineering and computer science.



FINAL THOUGHTS

As girls and women in STEM, we are used to looking around us and seeing predominantly male figures, be that in our peers, professors, or prominent professionals in the field. Oftentimes what happens in STEM environments like Robotics is that girls are being relayed to either a background or “note-taking” role, reluctant to speak up. We have proven that there is no need for that to be the case, and that our robotics team can be just as successful with girls and women spearheading the operation.



TLDR;
If you're a girl interested in Robotics, try it out! Who knows, it might become your new favorite thing!

References

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