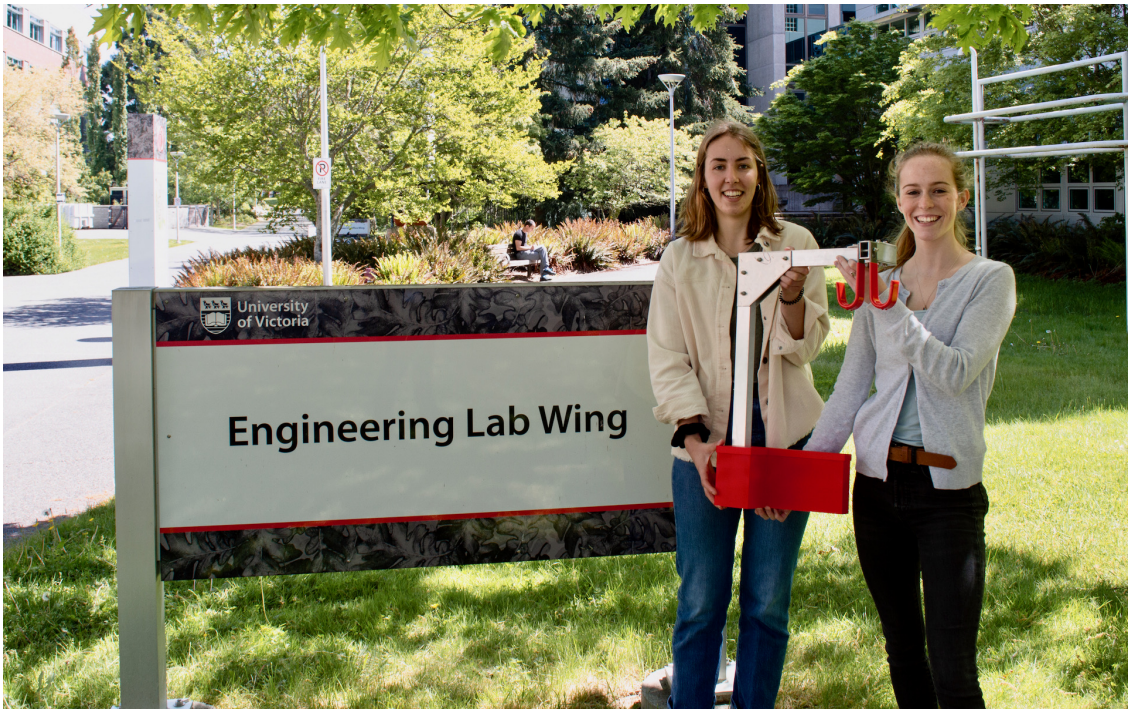
Team's device for wheelchair users wins BC design competition



(L-R) Jacqui Moreland and Kim Arklie display the partially assembled MobilArm on campus at UVic. The two students belong to the same COVID "bubble."

2021 May – A team of UVic students who developed a device that will enable power wheelchair users to independently unload their shopping bags has taken first place in a province-wide design competition.

A Victoria resident named Gilda approached the UVic Biomedical Engineering Design Team (BMED) last year, explaining her frustration at not being able to unload grocery bags and other items placed by store clerks on the back handles of her power chair.

Seven members of the BMED team got to work, collaborating with local health professionals and two manufacturing firms to design and build an ingenious device that attaches to a power chair. This month, their work earned the group first place in the Simon Cox Student Design Competition, held annually by Technology for Living.

"The team was thrilled to learn we'd received the first-place award," said Kim Arklie, team lead and principal designer. "More importantly, though, we are beyond honoured to have had the chance to work on a project that will have an impact on the lives of so many people."

The device, called the MobilArm, is a cost-effective mechanical solution that attaches to the side of a power chair, using gears and pulleys to rotate a metal arm from the back to the front of the chair. Shopping bags are place on the arm, which swings 270 degrees. Power chair users turn a handle located near their armrest to move the mechanical arm and conveniently access carried goods.

CAREERS IN ENGINEERING & COMP SCI

+ Our programs

RECENT NEWS

- MSFHR award aimed at improving patient outcomes
- Rainhouse event celebrates student innovation
- College students bridge to UVic Engineering

More news

UPCOMING EVENTS

- Oct 17 - Pathways to Quantum: An introductory workshop on quantum computing for youth
- Oct 21 - Dewatering of contaminated sediments with geotextile tubes
- Oct 28 - Zero Emission Vehicle Transportation Showcase
- Nov 04 - Low-damage timber structures with improved seismic resilience

More events

FEATURED HUMANS

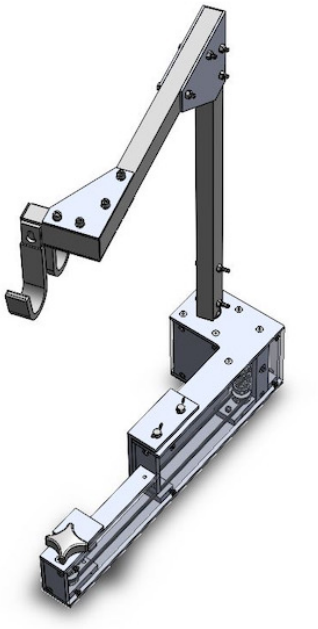
- Robert Lee – *Computer*

During the project's initial stages, the Queen Alexandra Centre for Orthotics, Prosthetics and Seating provided team members with extensive expertise on power wheelchairs and the functionality of the device for the user.

Once the device is delivered to Gilda around the end of May, formative testing will begin with the Victoria woman. From there, the team will test the device with other power chair users to acquire additional feedback on the device's functionality and usability. Ultimately, the group hopes to reach out to not-for-profit organizations to see if they are interested in manufacturing and distributing the final product.

During the project, the BMED team followed COVID-19 restrictions by meeting online weekly to discuss progress. All prototyping had to be done individually, with minimal access to school facilities.

"Our team members were able to collaborate during all stages of the project and learn valuable real-world skills that can be implemented in their future careers," said Jacqui Moreland, who shares the position of team lead and principal designer with Arklie and is in fourth-year biomedical engineering. She says these skills included learning about static loading and gear-train calculations, computer-aided design, 3D printing, engineering drawing creation and design for assembly.



Top view of a computer-aided design of the MobilArm.

"The team made the most of the situation and we are very proud of what we accomplished given the circumstances," added Arklie, who is in fourth-year mechanical engineering.

In addition to Arklie and Moreland, team members include Lauren Mark, Lilly Roberts, Logan O'Reilly, Irene Lopez and Adam Chen.

Eleven teams of post-secondary students from across BC competed for four awards, which all recognize designs that enhance the lives of persons living with disabilities. This year's competition award ceremony was livestreamed by Technology for Living, a not-for-profit leader in assistive technology that strives daily to improve the independence and quality of life of BC residents with physical disabilities.

Before delivering the device to Gilda later this month, team members are waiting to receive the final components from their two machining sponsors, Rainhouse Canada and JS Foster Precision Manufacturing. UVic provided 3D-printing resources essential to the prototyping phase of the design, while the team's faculty supervisor, Prof. Stephanie Willerth, provided additional resources and support.

Arklie said team members are grateful for all the support they received, which made their project possible.

"The team and I are overjoyed and are honoured to have had the chance to participate in such an inspiring event whose purpose is to increase the independence of persons with disabilities," she said.

2021May18 AT

Engineering, graduated with a BEng in May 2021

- May 2021 graduates Jason Tinker, David Kinskofer, Hanna Atmanspacher-Wirth, Keanu Enns, Nishra Shah, Jacob Verhelst, Becca Thomson, Connor Balogh, Kelsey Kalk, AJ Messner, and Whitney Dluhosh share thoughts on graduating, future, and time at UVic

More humans

FOLLOW US

- Twitter
- Facebook
- Instagram
- Youtube