

Student Innovation

@ the



2017



**12 Tips to Master the
Innovative Mindset**

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Follow these tips to master the innovative mindset

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Start Here



About ‘Student Innovation @ the U’

“Student Innovation at the U” is an annual publication celebrating student innovation and impact at the University of Utah. A digital version is available at lassonde.utah.edu/studentinnovation2017. This publication is produced by the Lassonde Entrepreneur Institute, an interdisciplinary division of the David Eccles School of Business and the hub for student entrepreneurs and innovators at the U. Learn about the Lassonde Institute at lassonde.utah.edu.

This publication is managed by staff at the Lassonde Institute, including:

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Contact Us: Have a question? Want copies? Do you want to nominate a student to be featured in the next edition? Or do you want to be a contributor? We want to hear from you. Contact editor Thad Kelling at thad.kelling@utah.edu or [801-587-8811](tel:801-587-8811) or contact the Lassonde Institute at lassonde.utah.edu or [801-587-3836](tel:801-587-3836).



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President Msg

A challenge to U students

The University of Utah is an exciting place to be a student. Here, you are taught by world-class professors, and supported by incredible staff, in remarkable facilities. We are paving the way in new and important research areas such as genetics, bioengineering, computer graphics and the arts. The campus community is comprised of students who are diverse, passionate and intelligent. The success of the university is known worldwide, yet we offer some of the most affordable degrees anywhere. All of this is set against the backdrop of five beautiful national parks.

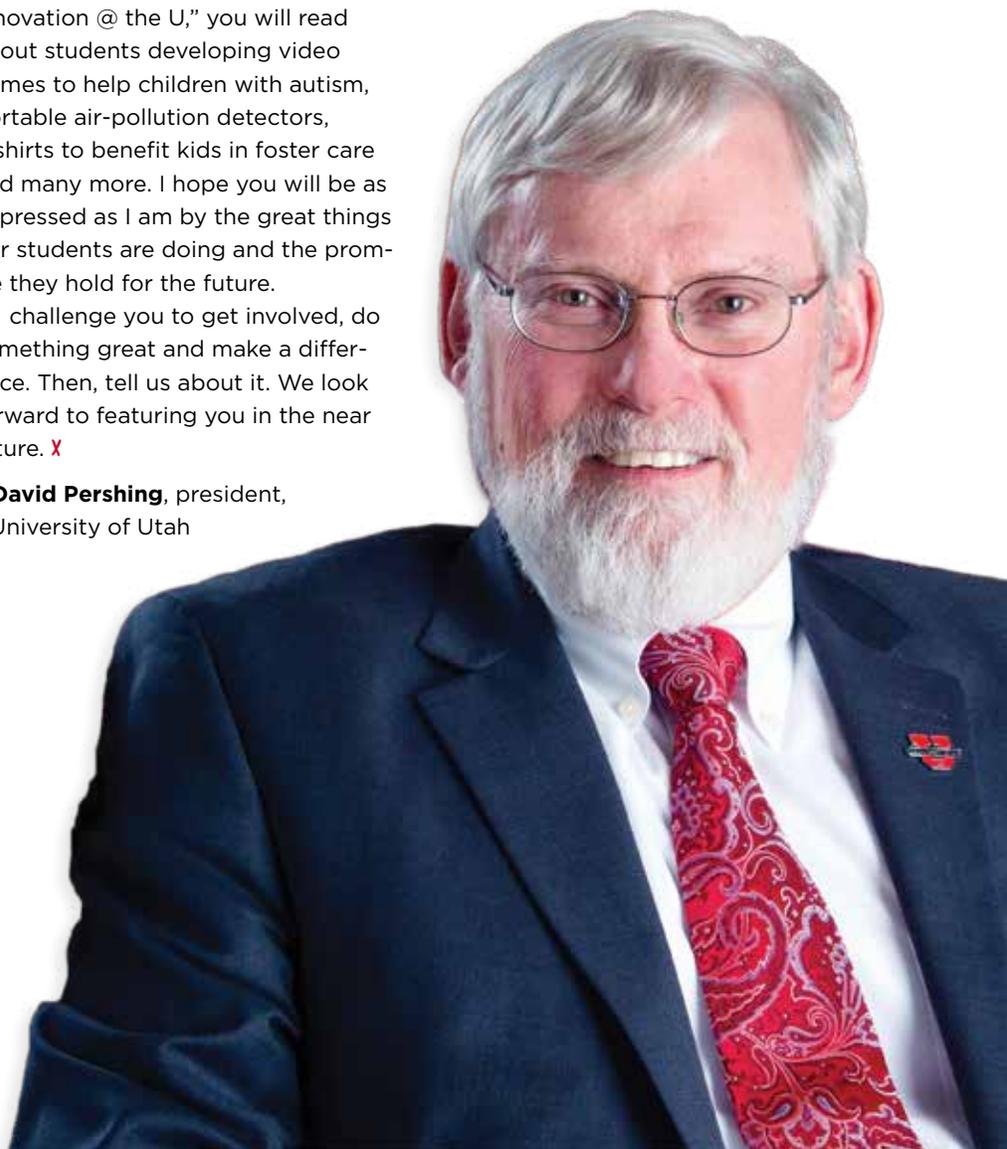
We add to these qualities another that makes the U even more appealing: **We challenge every student to deeply engage in their educational experience and to apply what they are learning.** Build something. Start a company. Be innovative. Breathe life into ideas, and turn your dreams into a reality. We want every student to receive the best education possible, and while they are on campus, we also want them to have the opportunity to put their new knowledge to work. This challenge is embodied in our motto: "Imagine. Then Do."

You don't need to look hard to find evidence of our students accepting this challenge. In every corner of campus, students are engaged in meaningful projects that have the potential to positively impact the world, as well as those participating in the process. To showcase these students and their work, we offer this publication. "Student Innovation @ the U" is a collection of stories written by current students and alumni. They were nominated and selected to showcase the breadth of opportunities at the University of Utah and the potential of all students.

Inside the fifth edition of "Student Innovation @ the U," you will read about students developing video games to help children with autism, portable air-pollution detectors, T-shirts to benefit kids in foster care and many more. I hope you will be as impressed as I am by the great things our students are doing and the promise they hold for the future.

I challenge you to get involved, do something great and make a difference. Then, tell us about it. We look forward to featuring you in the near future. **X**

- **David Pershing**, president,
University of Utah



No Soil Required

SUSTAINABILITY | HYDROPONICS

Imagine a garden in your home that requires no soil. **Georgie Corkery**, an environmental and sustainability studies and urban ecology major with a minor in design, spent her summer researching this idea, known as hydroponic lighting. **Steve Burin**, a professor of civil and environmental engineering at the U, helped mentor Corkery through the research.

“Hydroponic systems are growing systems that don’t require soil, you just use water and add nutrients,” Corkery said. “I wanted to know if food would grow more efficiently in hydroponic systems verses in soil by comparing energy, water and nutrient use as well as pounds of yield for both growing methods.”

At the end of her research, Corkery found that plants in the hydroponic system grew substantially faster than those in soil, but use sig-

nificantly more resources. “The kale plants in the hydroponic systems produced more kale than a kale plant growing in soil,” she said.

The point of this research was to determine how to maximize urban agriculture and specifically focusing on growing systems that people can use in their homes.

Along with her research, Corkery is also the lead steward for the **Edible Campus Gardens**, which is a student program ran through

the sustainability office. She is the farmers market booth manager, the greenhouse coordinator and leads volunteers in educational work sessions.

“We teach volunteers how to grow organic gardens and give them the skills to grow food on their own. The most sustainable thing you can do is grow your own food,” she said.

To learn more about the edible campus gardens, visit sustainability.utah.edu/edible-campus-gardens. X



A woman with blonde hair, wearing a grey scarf and dark jacket, is watering plants in a greenhouse. She is holding a green watering can. The greenhouse has a metal frame and translucent panels. In the background, there is a metal shelving unit with various gardening supplies, including a green watering can, a white bucket, and a black bucket. A large red bucket is on the ground to the right. The floor is covered with straw mulch and green plants.

Tip 1

Think Sustainably

Put the Earth first. Before you act, consider how it will impact the environment, the air and everything around you.

Thinner Solar Cells

Dennis Pruzan, a materials science and engineering Ph.D student, is innovating the future of solar energy. In collaboration with professor **Michael Scarpulla**, he is researching how to make cadmium telluride (CdTe or “Cad Tell”) thin film solar cells that could disrupt the solar energy market.

CdTe is in the class of thin-film solar cells that are hundreds of times thinner than traditional silicon-based solar cells. “Cad Tell modules are currently cheaper to produce than silicon ones, which are the most commercially produced photovoltaic panels. Silicon is the material most roof-top solar panels are made of,” Pruzan said.

“Traditionally, when you think about solar, you think about silicon, which owns over 90 percent of the market share,” he said. “From a material-usage standpoint, you can use a lot less with

thin-film technologies.”

Their research is focused on developing an even cheaper method to deposit CdTe films. Current state-of-the-art CdTe is deposited using high temperature and under vacuum, which is very energy intensive. Pruzan is researching how to deposit the films at low temperature and at atmospheric pressure, which could represent significant cost savings if similar material quality can be achieved.

The research is currently in its early stages, but has received a \$125,000 grant from the **Utah Science and Technology and Research Initiative (USTAR)** through the Energy Research Triangle program (ERT) to develop their first prototype (shared with BYU and Utah State). He’s also received a USTAR student grant of \$1,100.

“That’s what’s been pushing this research. We filed a provisional patent with the U for this method,” Pruzan said. “This is going to be part of my thesis, my dissertation. We’ve submitted a manuscript on this, so hopefully that will be published soon.” X



Low-Cost Air Quality Sensors

Jonathan Whitaker will have a sigh of relief for more reasons than graduating in 2017. An undergraduate in computer engineering, he and a team of electrical and chemical engineers developed a low-cost air quality sensing platform that will be distributed to 150 schools across the Salt Lake Valley, with manufacture-ready plans for mass production.

Just how low-cost are these air sensor devices?

“To put it into perspective, our government monitors that gauge air quality can be upwards of \$30,000 apiece,” said Whitaker. “These devices are \$150 apiece, and they tend to consistently track air quality trends with these higher quality government monitoring systems.”

“Data from these devices scales really large really fast,” he added. “The larger the sensor network, the more represen-

tative our air quality data will be in more local regions.”

Utah homeowners have already benefitted from this technology, which has piqued interest during Utah’s seasonal winter inversion months.

“A lot of people don’t realize that the indoor air quality in their homes (winter or summer) can be worse than the outdoor air quality, even on a bad air day, he said.”

A big goal of the project is to create a diverse sensor network across the Wasatch Front. Under the mentorship and advocacy of **Kerry Kelly**, a professor of chemical engineering, and keen design-thinking mentorship from electrical engineering graduate student **Ahn Luong**, Whitaker’s research group received over \$1 million in resources, funded in part by the **National Science Foundation**. X





Tip

2

Be a Leader

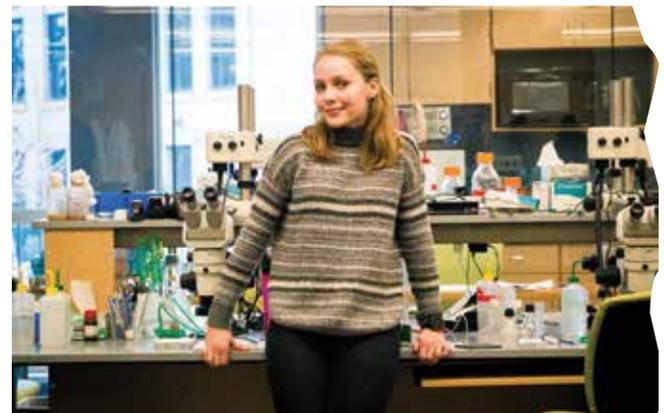
Why follow when you can lead? Take these stories as examples of how to use your time at the U to become a leader.

BIOLOGY

STEM Advocate

Lane Mulvey, an undergraduate biology major at the U, wanted to make the most out of her college career. “As soon as I got to college, one of my goals was to get involved,” Mulvey said. So she did just that. She joined a roller derby team, became a campus life mentor, joined the **Biology Student Advisory Committee** and worked her way up to the position of editor-in-chief for an on-campus STEM publication called “**The Sponge**.” “We provide a platform for students in the STEM fields who are typically seen as being technical to express their artistic talents,” Mulvey said about the publication. “‘The Sponge’ acts as a

creative outlet for students to share poetry, drawing, photography and short stories.” Under the guidance of professor **Nitin Phadnis**, Mulvey also works as an undergraduate researcher and as a genetics teaching assistant, helping students understand concepts such as evolution and speciation. “Dr. Phadnis has been a phenomenal mentor,” Mulvey said. “He really challenges his undergraduate researchers, creating a wonderful environment for growth and the development of critical thinking skills.” Learn more about Phadnis’s lab at flygenetics.com and about “The Sponge” at thesponge.eng.utah.edu. X



OUTREACH | ENTREPRENEURSHIP

Promoting Social Entrepreneurship

Liz Morales, an ethnic studies and communications major, has devoted herself and her education to create opportunities for under-served populations in higher education.

“I realized entrepreneurship is more than just a product-based entrepreneur. It’s someone that wants to change something in the world,” Morales said. “That’s what social entrepreneurship does. It makes people think. It makes people passionate.”

Through the **Lassonde Entrepreneur Institute** she started a program called the **Lassonde Ambassadors**, which works with first-generation, non-traditional, undocumented students on and off campus to promote innovation.

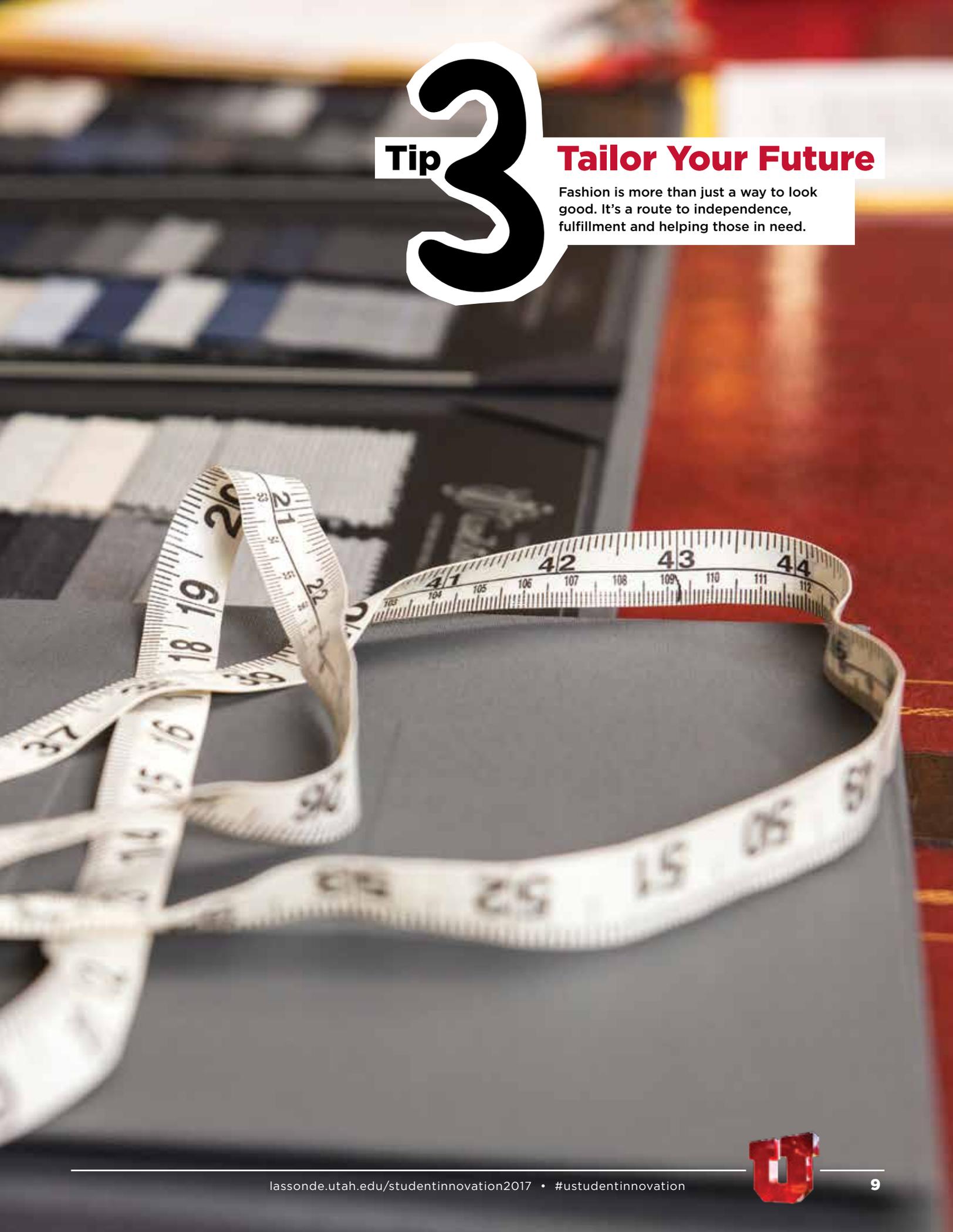
“It’s been amazing to surround myself with people from all different majors, with a common goal of building a better institute and better world,” Morales said. X





*U student **Trapper Roderick** fitted **President David W. Pershing** for a custom suit in Pershing's office at the University of Utah in fall 2017. Pershing is among numerous high-profile clients, ranging from developers and bankers to religious leaders and professional athletes, to get a tailored suit from Roderick's company, **True Gentleman**. Learn more at truegentleman.com.*





Tip

3

Tailor Your Future

Fashion is more than just a way to look good. It's a route to independence, fulfillment and helping those in need.





The Art of Foster Care

CHARITY | ENTREPRENEURSHIP

When you start a new class, you don't usually expect to end that class with your own benefit corporation. For **Daniel Hirst**, an electrical engineering major, **Meghan Pollard**, a marketing major, and **Caden Gregorie**, an entrepreneurship major, that's exactly what happened. During the spring semester of 2016, these three students fell on the idea of helping kids in foster care.

"We didn't know how to help, but we knew people that had been involved. We knew there was a lot of social opportunity to rethink the norm and build some type of company," Hirst said. "We knew we could make a difference in something."

With the help of **Barclay Burns**, a professor of entrepreneurship, the students

started the organization **Foster the Children**, which creates T-shirts from artwork produced by children in foster care. The proceeds from the T-shirts are then used to support the children in their education and future. Foster the Children has sold 75 shirts.

"One of the problems with kids in foster care is they are

really depressed," Hirst said. "Our proceeds go towards educational opportunities for them. We wanted to raise awareness and help in any way possible to make an impact for these children."

Foster the Children is currently partnering with the **Utah Foster Care Foundation** and **First Star Academy**

to help those in foster care. **Sandi Pershing**, assistant vice president for engagement at the U, and **Troy D'Ambrosio**, the director of the Lassonde Institute, are on the University of Utah First Star Committee that works with Foster the Children. X





CHARITY | ENTREPRENEURSHIP

Celebrate Everyday

It all began in early 2016, when **Jocee Porter** was volunteering for **Big Brothers Big Sisters** between classes in computer engineering at the U. She met a 16-year-old girl who recently lost her father and couldn't afford a prom dress. Porter wanted to help, so she reached out to her friends and quickly found her one.

That would have been the end of the story, but Porter kept talking to friends about what she had done, more people asked for her help, and she kept collecting more dresses. Pretty soon, she

had more dresses than she knew what to do with. "I had all of these dresses anyway, and I thought, 'Why not start something with it?'" she said.

Her solution was starting a company, **Celebrate Everyday**, and she has now collected more than 250 dresses. Her company is based out of her parents' house; the dresses fill their theater room. Through her company, Porter provides the dresses for free to women across Utah.

Porter had no idea how popular her company would be. She spends 20

hours per week receiving requests, meeting with clients and caring for the dresses. She has had to limit her advertising because she can't keep up with demand, while also maintaining her grades and everything else she does. And in winter 2016, she partnered with the **Tim Tebow Foundation** and **Genesis Project** to provide over 100 dresses to the annual special needs prom, **Night to Shine**, held in Salt Lake City.

Learn about Celebrate Everyday by visiting their Facebook page: [facebook.com/celebrateeverydayorg](https://www.facebook.com/celebrateeverydayorg). X





Tip

4

Game On!

The U has the best video game program in the nation, so it's no surprise students are creating amazing games, apps and VR experiences.



ENGINEERING | GAMES

A Portable Arcade System

U student **Nick Mountz** and high school classmate **Dalton Clift** combined a passion for technology and an entrepreneurial spirit to create **Microcade**, a small, portable, modifiable and stylish arcade cabinet, with support for over 35 consoles and other classic arcade systems. The Microcade features a 9-inch HD display, eight authentic arcade push buttons and an arcade-style joystick. Learn more at microcadesystems.com. X





Choreografish

HEALTH CARE | GAMES

For the fall 2016 semester, **Kun Cheng**, an **Entertainment Arts and Engineering (EAE)** graduate student, was the lead engineer developing a virtual reality video game for students with autism through the **Therapeutic Games & Apps Lab (or Gapp Lab)**.

Given the framework provided by University of Utah dance instructor **Eric Handman**, EAE students under Cheng's leadership created an interactive VR game that allowed autistic students to control a school of virtual fish while taking dance lessons. The game, **Choreografish**, helps teach spatial skills for students with autism.

Autism is often characterized by stimulus over selectivity, or the tendency

to focus on a minute object rather than the whole picture. Cheng and Gapp Lab's game worked to address this condition in students in relation to their dance education.

Understanding this increased sensitivity, Cheng's team aimed to create a calming environment that involved students within autism. "We wanted to give them an environment that doesn't feel very tense," Cheng said. "There is no

score in that game, there are no requirements. The game is just for creation, for enjoyment."

The game shows an immersive virtual underwater world. The player wears a headset on their eyes and holds two controllers to control the game. By using the two hand controllers, the user can move a school of fish within the game.

"Choreography is all about movement and music," Cheng said. "So we just combined the movement — which is the movement of the controller — and enabled control of the shape and speed of the school of fish."

Cheng added: "There is some music that the player can choose. The player can

shape the school of fishes with the music, and they can record their progress. They can create something that is really cool, where they can keep calm in the environment and feel."

Several students with autism tested **Choreografish** in the Gapp Lab and provided evaluation feedback. It's currently in further development at the school of dance at the U.

"Teamwork played an important role in the development of ACEE. This project was the team's success. My teammates were talented and team players," Cheng said, crediting **Sydney Ritchie**, the team producer, and **Jeff Jackman**, the artist on the team. **X**





APPS | COMPUTER SCIENCE

Tracking Campus Shuttles

In response to the lacking presence of a native iOS application for the University of Utah's shuttle system, **Nick Porter**, a **Lassonde Studios** resident and computer science student, developed an application to provide detailed real-time information to students, staff and visitors across the campus. Download the app at bit.ly/ushuttles. X



Hashtaggy

APPS | SOCIAL MEDIA | ENTREPRENEURSHIP

When **Ryan Bliss** first arrived at the U, he was told exactly what to expect: lifelong friendships and a never-ending amount of social events. But what he experienced was much different. Students were socializing less and using social media more. According to a study done by UCLA, college is the least social it has been since they started recording it in the 1980's.

"I was baffled. I wanted to do something about it. People wanted a solution, people needed a solution," said Bliss, a finance major.

Bliss believes **Hashtaggy**, a social media app he created, is the solution. Here's how it works: Users follow hashtags that represent their interests and gain access to everything going on around campus. "We focus on the 90 percent of events that happen every day,

which are casual activities and hangouts. We're not an events app. We're an activities app," Bliss said.

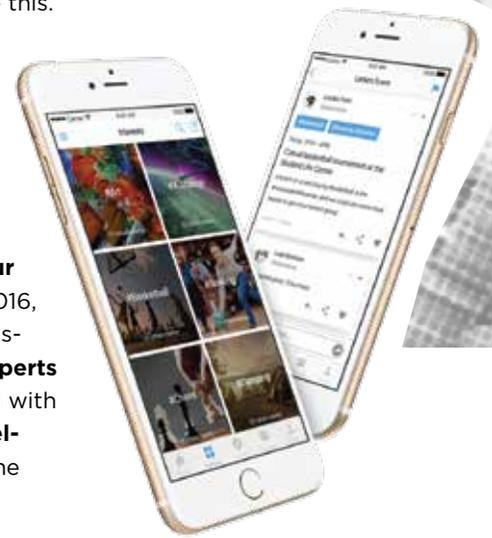
For example: Let's say you love soccer, and you're with two other friends. You're thinking, "I wanna play pickup soccer and need three more friends." That's where Hashtaggy comes in. You take out your phone, you scroll through the Hashtaggy feed, and find #soccer. If there's nothing

going on, you make a post saying, "Who wants to play #soccer?" Everyone who has Hashtaggy in that area can respond and RSVP. "Our mission is to connect college students to what they're passionate about with others on campus. The message was clear. People wanted something like this. Something to connect to the community," Bliss said.

The Hashtaggy team, consisting of 13 U students, got their start through the **Lassonde Entrepreneur Institute** at the U. In 2016, they participated in Lassonde's **Hours with Experts** program. They worked with the **New Venture Development Center** over the

summer and are also a part of the **Company Launch** program at Lassonde. In fall 2016, they participated in **Get Seeded**, where they were awarded \$1,600.

To learn more about Hashtaggy, visit their website: hashtaggy.co. X



PUBLIC SAFETY | VIDEO GAMES

Training Police through VR

Jed Merrill and other students in the **Entertainment Arts and Engineering** program created **B.E.S.T.**, a virtual-reality simulator that helps police officers de-escalate potentially dangerous situations. The tool could help lower the more than 1,000 citizens killed by police officers per year. Learn more at bestpolicetraining.com. X



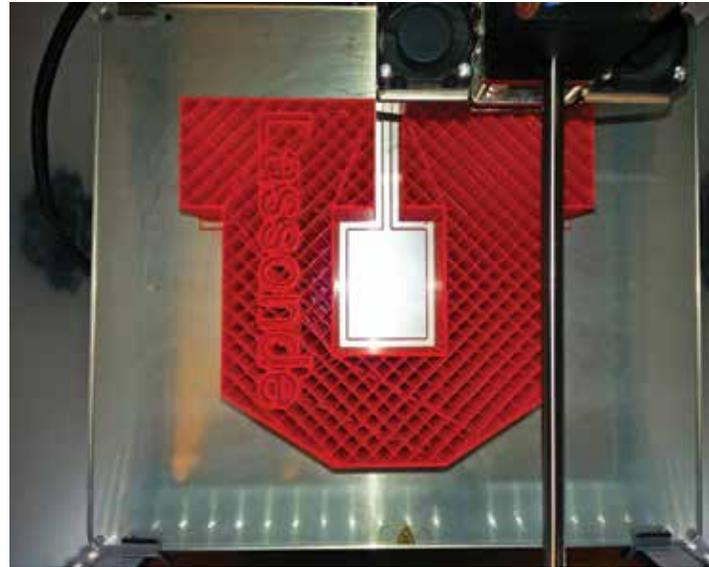


Tip

5

#LiveCreateLaunch at Lassonde

All students are welcome to live, create new products and launch companies at Lassonde Studios at the U.



The image at the top shows the first **Lassonde 400** group, the residents at **Lassonde Studios**, on the first floor. Clockwise from bottom right: Lassonde Studios entrance, a loft residential room, hangout at the fire pit, the Neeleman Hangar, a 3-D printed block U and a food truck workshop.





ALL STUDENTS WELCOME

Lassonde Studios

Lassonde Studios is the new \$45 million home for student entrepreneurs and innovators at the U. The facility, which opened in August 2016, is the place where students from any major or background can “Live. Create. Launch.” Students can apply to be one of the 400 residents. All students are welcome to use the Neeleman Hangar, the 20,000-square-foot innovation space on the first floor. Above are four floors of themed residential space. The building and diverse engagement opportunities are managed by the **Lassonde Entrepreneur Institute**, an interdisciplinary division of the **David Eccles School of Business**. Learn more at lassonde.utah.edu/studios. X





GAMES | FANTASY

Art of Games

One of **Cody Lee**'s first memories was playing video games with his brother when he was 3 years old, and his obsession has only grown over time. "Video games have become a huge part of my life," he said. "I would dare to say that it defines me as a person, and without it, I do not know who I will be." Lee is now a graduate student in the the U's top-ranked **Entertainment Arts and Engineering** program. When he's not in class, he's probably designing creatures inspired by Lovecraftian gods, deep sea creatures, elk, deer or fox. He's driven to continually improve his skills and inspire artists like so many others have inspired him. **X**

Tip

6

Embrace the Arts

Art is more than just beauty. Students are using their passion for arts to improve lives and change how we spend our free time.

FILM | DIVERSITY

Bringing Representation to Film

At the 2016 Academy Awards, the issue of diversity — or lack thereof — was widely acknowledged, with many actors threatening to boycott the show. It's no secret that Hollywood struggles with on-screen diversity, which is exactly what makes **Fatima Liaqat** so passionate.

Liaqat was born and raised in Pakistan and moved to Salt Lake City at the age of 13. While she has always loved film, it wasn't until she took a screenwriting class that she decided to make career out of it. After graduating, she moved to LA and became an intern at "**Buzzfeed**," where she made videos that challenged gender norms (like her video called "My Boy-

friend Shaved My Head").

While she loved working at "Buzzfeed," Liaqat's true passion is in telling stories of people under-represented in film. "There are so many stories that aren't told," she said. "That's where I see myself as a filmmaker coming in. I'm not going to tell every story, but I'm going to tell a few that haven't been told yet."

In 2015, she participated in the **Creative Mind Group**'s "Live the Dream" program. She won a chance to go to **Sundance** and direct a short film. Her film is called "Specific Heat," and is about an LGBT couple and the give-and-take every relationship requires. **X**

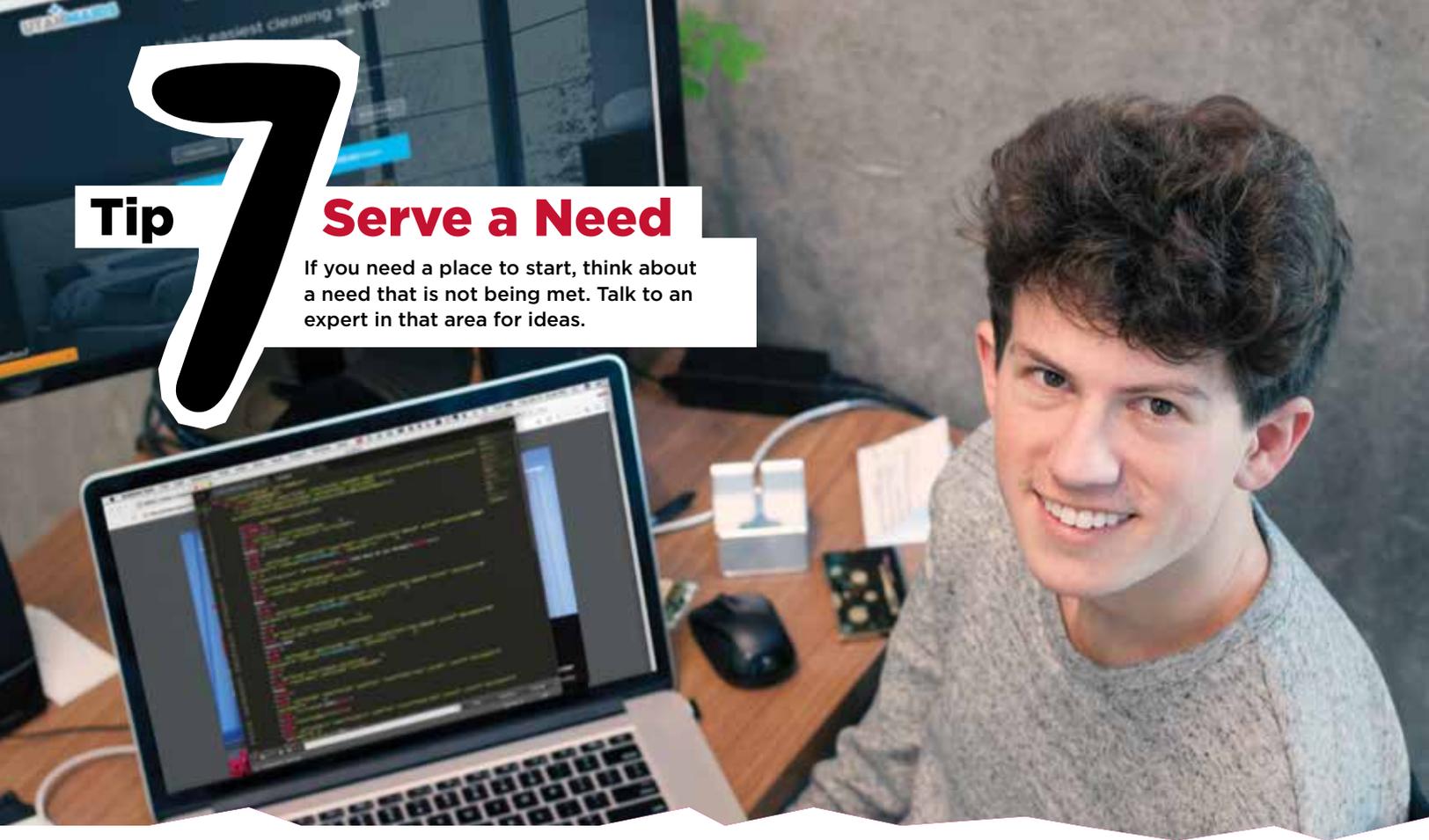


Tip

7

Serve a Need

If you need a place to start, think about a need that is not being met. Talk to an expert in that area for ideas.



E-COMMERCE | ENTREPRENEURSHIP

A Faster Way to Clean Your Home

Jaron Hall is graduating with a degree in business administration in May 2016 — and he has no plans to get a job. He hasn't had a regular job since 2014. Instead, Hall plans to focus all of his attention on his latest startup, **Utah Maids**.

In 2015, Hall launched the company for less than \$2,000 with **Alex Ledoux**, who recently graduated with a communications degree from the U. Both experienced entrepreneurs, they looked everywhere for an idea worth pursuing, and they arrived at house-

cleaning as an industry full of potential. "We knew we could do it," Hall said. "It's not a super complicated industry. We're not building a biotech company. It's housecleaning."

Their idea was to improve the customer service experience when hiring a housecleaning company and scheduling an appointment. Utah Maids provides a website with an easy-to-use scheduling process that allows customers to "book a housecleaning in 60 seconds or less."

Utah Maids was their side project

until it gained momentum in spring 2016. They started getting more appointments, gaining employees and improving their systems. They have continued to grow, cleaning more than 500 homes since they started and employing seven people. Among other highlights, they received free office space from the **Lassonde Entrepreneur Institute** and secured a \$10,000 investment from the **Campus Founders Fund**.

Learn more and book a cleaning at utahmaids.com. X

FOOD | ENTREPRENEURSHIP

Bringing Crepes to SLC

Something is missing from the SLC food scene. Crepes! **Jordan Nilsson**, a business administration major at the U, noticed this gap. After visiting restaurants in other states and South America that served the dish, he began to think about how crepes would be a cost effective and simple meal to serve in a restaurant of his own. Then he bought a food cart and launched **Bon Appetit Crepes** with help in the form of grants for \$1,700 and \$3,300 from the **Get Seeded** program provided by the **Lassonde Entrepreneur Institute**. X





Biodegradable Pads

HEALTH CARE | ENGINEERING

For many women around the world, feminine hygiene products are not easily available or accessible. Women are often forced to stay home from school and work during their menstrual cycle. **Alicia Dibble, Amber Barron** and **Ashlea Patterson**, material science and engineering students, are working to solve this problem.

“When women can’t access any means to deal with their period, they stay home instead of going to work or school. It leads to a huge disparity between men and women in developing countries,” Barron said. With the help of **Jeff Bates**, an associate professor of material science and engineering, and **Megan Shannahan**, a business advisor for the engineering department, the students created a startup called **SHERO — Sustainable**

Hygiene Engineering Research and Operations.

“The original need was for a super absorbent material that SHEVA (a local non-profit in Guatemala) could put into a pad,” Patterson said. “Once we began, the product morphed into an entirely biodegradable pad that women can make themselves in Guatemala. We are coming up with a ‘recipe’ of materials to make the pads, which can all be found at their local

markets, such as banana peels, rice and cotton pads. We are also designing a press that women can use to press the materials into pads themselves, similar to a tortilla press.”

Not only are they designing biodegradable pads and presses for women in Guatemala, SHERO is also designing pads for women in the United States to fund the process. “The sale of the SHERO pad will go to making the pads, producing money to support educating Guatemalan women on menstrual cycles and sending the presses over,” Dibble said. These pads will be sold, packaged and pre-assembled, just like any other pad. But what sets them apart from other feminine hygiene

products is that they will also be made of biodegradable material.

Over the course of the average American woman’s life, she will produce over 6,400 pounds of feminine hygiene waste, meaning one percent of landfill is women’s hygiene products, which are not biodegradable. “All of us are so devoted to this project and committed to making a difference. Everyone is excited to be a part of that. It’s an idea that everyone can get behind,” Barron said.

SHERO has received funding for their startup from **Lassonde Entrepreneur Institutes’s** Get Seeded program, receiving \$3,000 for research, prototyping and startup costs. X





Tip

8

Care for Others

The U is a leader in health care innovation and personalized medicine. Get involved by joining a project or starting one.





BIOENGINEERING | MEDICINE | ENTREPRENEURSHIP

Helping Patients Catch Their Breath

When it's a matter of life or death, it's important to constantly improve the industry. Which is why, when U faculty member and anesthesiologist **Sean Runnels** had an idea for a safer upgrade to breathing tubes and the process of inserting them, it wasn't difficult to recruit students for his team. He reached out to the **Lassonde New Venture Development program** to grab talented graduate students and form Through the Cords, LLC.

One of the students involved is **Benjamin Fogg**, a medical and bioengineering student. He elaborated on the current issues associated with inserting breathing tubes.

"Breathing tubes are used for surgery, or when someone isn't able to breath on their own," Fogg said. "Our products have to do with intubation; the devices, an introducer and breathing tubes, make it easier to insert the breathing tubes safely, to reduce injuries, deaths and associated costs."

The unique design is a color-coordinated device that, when inserted, is easily monitored using a medical camera. The tube is inserted until it is visible on the camera, which itself would have been inserted in the mouth. The physician can then maneuver the tube to assure it is neither going too deep nor too shallow. Learn more at throughthecords.com. X



BIOENGINEERING

Wedging the Internal Gap

As a biomedical engineering major, **Brian Cottle**, in his sophomore year at the U, developed "**The Wedge**." It is used for abdominal muscle endurance testing in clinics that study intra-abdominal pressure. It allows clinics to consistently measure someone's abdominal strength. You're probably wondering, "What's the point?" According to the National Center for Health, 24 percent of women will have a primary or recurring pelvic floor disorder, a disorder

where organs fall or droop below the abdomen, causing extreme discomfort. "This study aims to debunk or understand the correlation between the intra-abdominal pressure and failure of the abdominal area. It's a hidden epidemic," Cottle said. He has worked on numerous projects in a lab managed by professor **Robert Hitchcock**. Learn more about Hitchcock's at hitchcock.bioen.utah.edu. X

Tip

9

Use Design -Thinking

Next time you approach a problem, ask yourself, “How can I design this better?” Your answers might surprise you.

MULTIDISCIPLINARY DESIGN

If you are a student interested in design, look no further than the **Multidisciplinary Design** program, or MDD, which is part of the **College of Architecture and Planning**. They teach every aspect of design, and every year, juniors and seniors get to develop real products around a theme. The 2016-17 theme was “adaptive future.” “The impact all designers seek happens at the intersection of design resolution and entrepreneurship,” said **Cord Bowen**, the director of this program. Here’s a look at some of the projects from fall 2016:

Fish Wasatch

Bryson Benton’s project is called **Fish Wasatch** and is a hyper-local fishing app for the Wasatch Mountain Range. He designed this app with the key points in mind: guide, learn and share. The corresponding features of the app are downloading maps for offline accessibility, teach users how and what to catch, and sharing this with your friends via a built-in social network. X

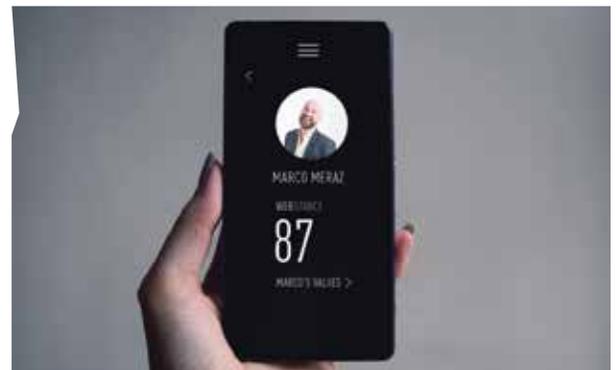


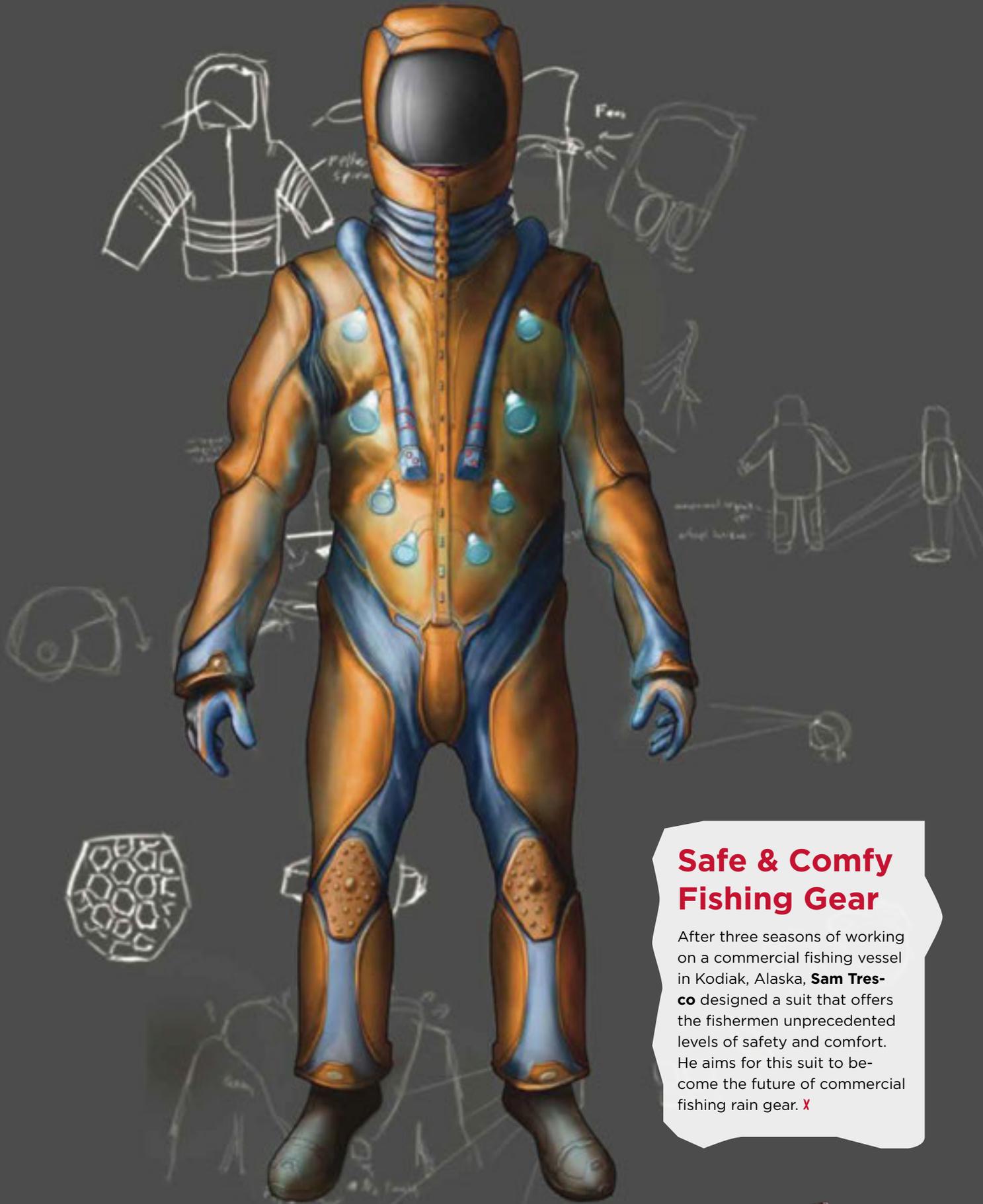
Resistive Exercise Device

Gray Turner’s project is called **WRED**, which stands for wearable resistive exercise device. It’s designed to combat muscular atrophy and bone mineral density in astronauts. Most astronaut exercise devices are extremely large and bulky, so WRED has the advantage of being smaller and more streamlined. It consists of a resistance harness that has various attachments like a foot strap. X

Webstance

Sara Ference began her project by asking herself, “How will artificial intelligence learn what we value?” She sought to provide a solution for this question, so she designed an application called **Webstance**. It captures all of a user’s data to catalog their online behavior, motivating users to better their online behavior. Her hope is that when artificial intelligence uses the Internet to learn about human values, it will find good things. X





Safe & Comfy Fishing Gear

After three seasons of working on a commercial fishing vessel in Kodiak, Alaska, **Sam Tresco** designed a suit that offers the fishermen unprecedented levels of safety and comfort. He aims for this suit to become the future of commercial fishing rain gear. **X**



Tip

10

Gear Up

Create a new tool to solve a problem you have or one you find in the world. Or find a tool to improve.

Portal Power

When **Mica Sloan** and **Aidan Daoussis** moved into the **Lassonde Studios** in the fall of 2016, they only had one thing in common: a shared loft space. Placed together by chance, the two strangers quickly discovered that they shared a bit more than just a living room and kitchen — these two out-of-staters would stumble into a startup as partners of **Portal Power**.

Daoussis, a business major and an active **Foundry** program member, first came up with the idea of creating a portable, simplified energy source several years ago. This source would provide people with a means to travel lightly and longer, while still maintaining their phone battery life.

However, it was Sloan, an engineering student and entrepreneurially minded professional photographer, that was able to take Daoussis's bright idea and design a tangible product and

market the business idea: Portal Cord.

"Portal Cord provides both backup, rechargeable, on-the-go energy, and also acts as a USB charging cord," Sloan said.

Since their decision to work together in September of 2016, Portal Power has become an officially registered LLC company, with a patent filed on the Portal Cord conceptual design. Additionally, Sloan has successfully produced several iterations of both functional and visual Portal Cord

prototypes. An electrical and computer engineer has also been selected to design the circuit board for the final product.

Portal Power has also received help from the **Lassonde Entrepreneur Institute** at the U, getting multiple grants from the **Get Seeded** program.

The company has conducted initial product outreach and customer validation research, seeing a strong backing of the startup concept thus far.

In the near future, Portal Power will be launching a Kickstarter to raise funds to move the company into full production. Until then, stay connected by following their Facebook, Twitter and Instagram, or visit their website at portalpower.us. X





BABY CARE | ENTREPRENEURSHIP

Smart Diaper Bag

If you have a baby on the way or already have one, two U students have a new product to keep on your radar.

Sariah Tate, a communication graduate, and **Emrys Tate**, Sariah's brother-in-law and recent graduate from the **David Eccles School of Business**, developed **Peke+buo** to make changing a baby simpler and more convenient for on-the-go parents. Product designer Sariah had the idea that there needed to be a more compact, more efficient diaper bag. "What if moms could take their own personal handbag out and about, but they still had everything they needed for a baby?" she said. Learn more at pekebuo.com. X

CHEMICAL ENGINEERING

Purifying Blood with Nanoparticles

Caleb Johnson is an undergraduate chemical engineering student, focusing on biology. With professor **Agnes Ostafin's** help, he tested the production of nanoparticles that purify blood and is developing a pilot-scale device that will perform this for commercial medical use. Using stable nanoparticles made out of gold, Johnson and Ostafin created chemical combinations that have exteriors that both attract and extract hemoglobin, a major problem behind sickle cell anemia, a medical condition that limits oxygen from being carried throughout the

body by red blood cells. "Patients undergoing dialysis will sit in chairs for 3-4 hours while their blood is filtered, which can filter out the good stuff too," Johnson said. "Similar to chemotherapy, patients can feel nauseous and tired after treatment." Traditional methods of dialysis often cause blood to sit outside of the body for long periods of time, which causes the body to work harder to filter out contaminants. But Johnson is helping develop a device that will clean blood quicker and more effectively. X

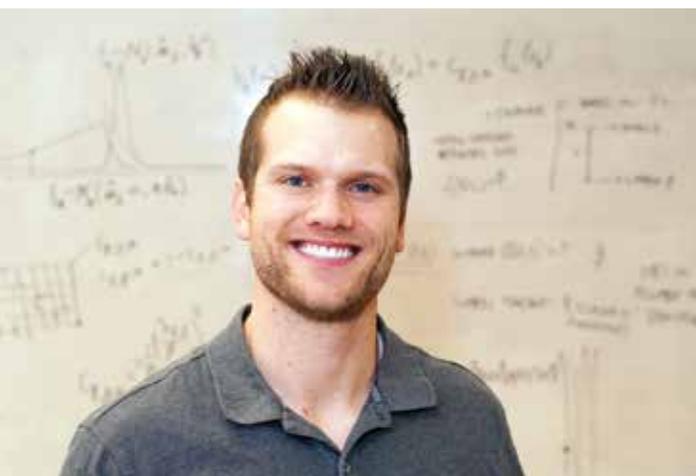


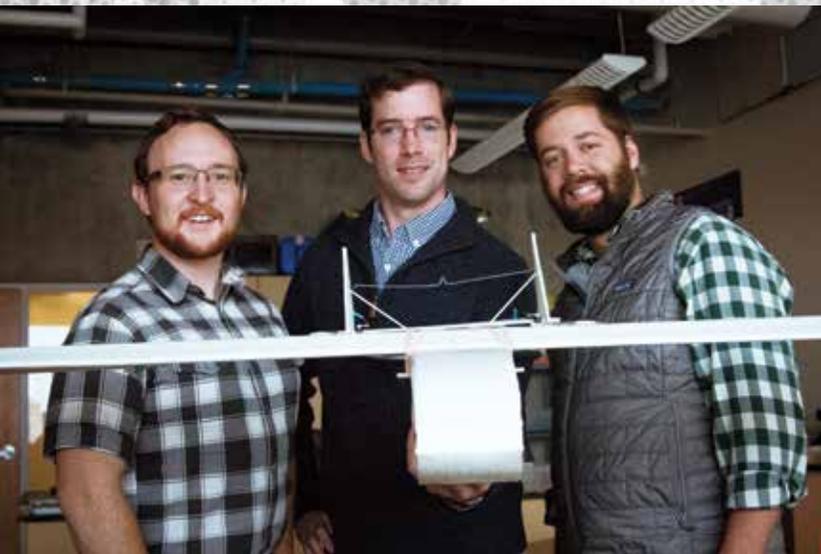
BIOENGINEERING

Infant Breathing Monitor

Every year, more than 3,400 babies in the U.S. die of sudden unexpected infant death syndrome, often referred to as SIDS. While it's rare, the chance is something that causes parents a lot of worry, and it helps explain why millions of baby monitors are sold every year. Relief might be on the way in the form of a technology being developed by **Spencer Madsen**, a Ph.D. student in bioengineering at the U. Through the lab managed by professor **Neal Patwari**, Madsen

is creating a wireless breathing monitor that can alert parents when their child's breathing changes. The startup company developing the technology is called **PlusOne Baby**. The monitoring system works by sending radio signals around the infant. The infant's breathing alters the strength of those signals, and the changes in the signals can be used to measure if the breathing is normal or not. "The sensor works like in-home wifi," Madsen said. X





GEOLOGY | ENGINEERING

Cheap Drones

Typical mapping drones cost anywhere from \$1,000 to \$50,000 to buy. **Casey Duncan** and **David Wheatley**, geology grad students at the U, and **Sam Chesebrough**, a grad student in mechanical engineering, wanted to make one for a fraction of the cost. And they succeeded. The three made one for only \$600. Their DIY drone was made using off-the-shelf materials, meaning ordinary materials anyone can buy. It's so cheap because of this, coupled with the fact that part of what you're paying for with a store-bought drone is the cost of labor. X

MECHANICAL ENGINEERING

Mining Ice on Mars

Humans have yet to visit Mars. Partly because it's 140 million miles away and partly because we don't have enough resources to sustain human life. The **Utah Robotic Mining Project** at the U is helping NASA solve this problem. "The Utah Robotic Mining Project is a club on campus with the sole purpose of designing and constructing a robot to compete in the NASA robotic mining competition," said **Emily Herman**, a mechanical

engineer and member of the team. Each year the team competes with over 50 schools at the **NASA Kennedy Space Center**. The point of the competition is to design a robot that is able to mine ice on Mars. Members of the team that placed seventh at the 2015-16 competition were **Emily Sherman, Geoff Sowan, Stacey Murgia, Matthew Sheridan, Teresa Petty, David Denson, John Robe, Cole Mortenson, Matt Wilson** and **Kaitlin Hall**. X



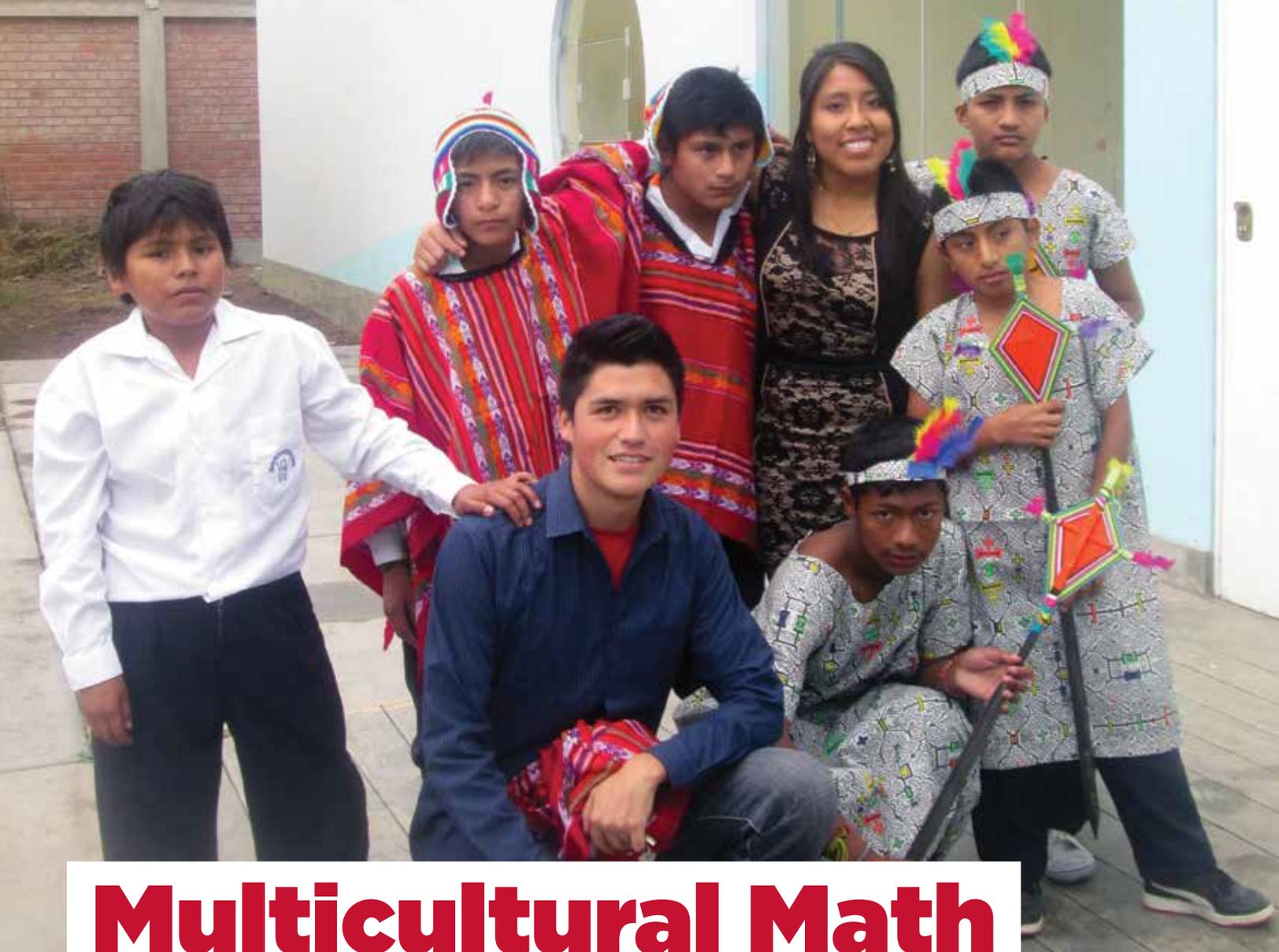
DESIGN | ENTREPRENEURSHIP

The Future of Bike Tools

Identify, refine, resolve. This design process is followed by **Evan DeGray**, a **Lassonde Studios** resident and **Multidisciplinary Design** major in nearly all of his pursuits, and it has proven worthwhile and effective in both his academic and entrepreneurial ventures. Founder of **Rugged Components LLC**, a company borne out of a need for better tool placement on both mountain and racing bicycles, DeGray said that the idea came from his "personal frustration with current products." As an avid cyclist and racer of mountain

bikes, DeGray found himself dissatisfied with the options available and started designing something innovative. The result was "a simple and elegant solution that would work on most bicycles," said DeGray, who is participating in the **Foundry** at the Lassonde Institute. The **Dialed Cap** is the world's first steer-tube integrated multi-tool, designed to last with heat treated steel and aircraft grade aluminum components so you will never forget your tools again. Learn more at ruggedcomponents.com. X





Multicultural Math

EDUCATION

Born in Huancayo, Peru, **Giulia Soto** moved to Utah at the age of five. Her parents speak Spanish and Quechua fluently, which influenced how she navigated the United States K-12 educational system.

“It’s like my parents learned math in a different way,” said Soto, who graduated from the U in 2016 with a double major in business administration and Latin American studies and a minor in Spanish. She is now pursuing a masters at the University of Pennsylvania. Differences in pedagogical approaches growing up

stuck with Soto until she enrolled in the **Innovation Scholar** program, which inspired her **Undergraduate Research Opportunities Program** project and honors thesis, titled “Peruvian Immigrant Experiences: Different Learning Cultures and Math Curriculum.”

Her UROP research suggested that more immigrant

students should have access to counseling and mentorship for higher education opportunities, as well as appropriate math placement, independent of their English language assessment.

“They learn math in a different way,” Soto said. “They had to learn how to cut out a lot of steps. They can do it faster.”

Giulia’s research involved interviews with Peruvian students in the seventh and eighth grade within the Greater Salt Lake City Area, and provided suggestions

to easing immigrant-student transition into the U.S. educational system. She presented her findings at the California McNair Scholars Symposium at University of California, Berkeley.

She discovered that it’s common for immigrant students to be placed into math classes one to two years below their knowledge and experience level. This leads them to be less challenged and unlikely to take advantage of higher education and college preparation opportunities. X

Tip

11

Do It for Your Community

While trying to change the world, don't overlook your neighborhood. That's often the best place to start.



INTERNATIONAL AFFAIRS

Voice for Minorities

Ashkan Azmak, a master's student in the **International Affairs and Global Enterprise (MIAGE) program** leads the design of a "marketplace plan" to improve dignity and connection to the outside world for Za'atari Camp refugees in Jordan, particularly women. "The idea is to engage and empower the minority at refugee camps," Ashkan said. An entry in the International Development in Action (IDeA) Public Administration Competition, the proposal could earn review for implementation by the United Nations. **X**



PSYCHOLOGY

Custom Education Plans

Most majors are a one-size-fits-all education plan that gives students a broad knowledge of an industry but lacks the various specific skills required for certain jobs. **Tyson Florence**, an **Innovation Scholar** and psychology major at the U, noticed this and created **Gradalign**, a company that helps students design a customized education plan and matches them with employers. Because it is a new company, Florence is currently working on beta testing. Learn more at gradalign.co. **X**

SOCIAL WORK

Business for Refugees

Before coming to the U to pursue a Ph.D. in social work, **Ujal Ibrahim** worked with the 2006 Nobel Peace Laureate in Bangladesh to help children of Grameen Bank (a bank for the poor with close to 9 million borrowers) borrowers to become entrepreneurs. Now he is bringing social good to Salt Lake City. Ibrahim is working with the **Microbusiness Connection Center (MCC)** and established a program that helps refugees start their own businesses. MCC provides refugees with business

classes that Ibrahim co-developed and teaches, as well as allows them to present their ideas to possible investors and network with other business owners. The refugees also get hands-on experience in business and product design through Design Labs. This program helps refugees establish a life here and encourages them to explore their creativity as well. It also contributes to Salt Lake City's economy by jump-starting business. **X**



Tip

12

Start Here

Now it's your turn. Get involved by signing up for one of these programs at the U.

Resource Directory

ArtsBridge: An interdisciplinary arts education outreach program. artsbridge.utah.edu

ArtsForce: A two-day conference for art students to learn about how to share their creative work. artsforceutah.com

Arts Entrepreneur: Connect with your peers, learn the value of your skills and explore connections between the arts and entrepreneurship. lassonde.utah.edu/art

Bench-2-Bedside: A competition for medical, engineering and business students to collaborate to develop or improve a medical device. bit.ly/UUb2b

bioDesign: Teams of engineering students work with clinicians to develop prototypes and test medical devices. biodesign.utah.edu

bioInnovate: Graduate program providing a comprehensive biomedical, device-design training program. bioinnovate.utah.edu

bioWorld: A two-semester course enabling students to develop a business plan for a medical-device in a developing country. bioworld.utah.edu

Business Scholars: An experiential program for high-achieving students offered by the David Eccles School of Business. scholars.business.utah.edu

Center for Innovation in Banking and Financial Services: Help innovate financial services, guide regulatory issues, and examine and support the deployment of new financial products and services. lassonde.utah.edu/cibfs

Company Launch: Apply for dedicated space at Lassonde Studios through the Company Launch program. lassonde.utah.edu/launch

Cowork: Take advantage of the many opportunities and areas in Lassonde Studios to work together and collaborate. lassonde.utah.edu/cowork

Designbuildbluff: A year-long program for graduate students in architecture who design and build homes in southern Utah. designbuildbluff.org

Campus Founders Fund: Apply for an investment from this unique fund or apply to be a student leader. campusfounders.com

Entertainment Arts & Engineering: Interdisciplinary program where students design and develop video games. eae.utah.edu

Entrepreneur Certificate: The David Eccles School of Business offers an undergraduate Interdisciplinary Certificate in Entrepreneurship. uentp.com

Food Entrepreneur: Learn about food entrepreneurship, test your recipes in the Miller Cafe and more. lassonde.utah.edu/food

Foundry at the Lassonde Entrepreneur Institute: An experience-based educational community where entrepreneurs can act on their business ideas and access resources to help. lassonde.utah.edu/foundry

Games4Health: Develop a health-related video game or app, design the business model, outline the clinical trial strategy and compete for prize money. g4h.business.utah.edu

Get Seeded: Pitch your business idea to your peers to receive seed funding for your venture. lassonde.utah.edu/getseeded

Global Public Health: Promotes health and medical development leading to measurable improvements. globalhealth.utah.edu

Global Health Scholars: Students get exposed to a variety of perspectives on global-health practices. bit.ly/globalscholars

High School Utah Entrepreneur Challenge: A statewide business idea competition for all students ages 14-18. More than \$30,000 in prizes. lassonde.utah.edu/hsuec

Hinckley Internship Programs: Internship opportunities are available to students interested in politics. hinckley.utah.edu

Honors Praxis: Students work together to find original solutions to problems our society faces while a faculty mentor guides the work of each group. honors.utah.edu

Hours with Experts: Sign up to meet with an expert in fields including law, business, design and engineering. lassonde.utah.edu/exporthours

Innovation Scholar: Students learn how to match their passion with a purpose and create a personal plan of impact. innovation.utah.edu

International Exchange/Study Abroad: Students participate in hundreds of programs all over the world based on their interests and career goals. learningabroad.utah.edu

International Leadership Academy: Students examine global leadership in business, government and non-profit organizations. Community mentors assigned. Email lehman@poli-sci.utah.edu

Sorenson Impact Center: Marshals capital for social good, empowers data-driven programs, breaks down silos across sectors and equips the next generation of leaders with social purpose. sorensonimpact.com

Lassonde Entrepreneur Institute: The hub for student entrepreneurs and innovators at the University of Utah. Many programs and opportunities open to all students. lassonde.utah.edu

Lassonde New Venture Development Center: Graduate students are paired with a faculty inventor and spend a year preparing a business plan. lassonde.utah.edu/new-venture-development

Lassonde Studios: The home for student entrepreneurs and innovators. All students welcome to live, create and launch here. lassonde.utah.edu/Studios

Legal Scholars: Students interested in law school learn about current legal issues and how to prepare for law school. bit.ly/legalscholars

Make Program: Learn how to use prototyping tools and see your idea come to life at Lassonde Studios. lassonde.utah.edu/make

Meetups: Join the Lassonde Institute at a meetup event to find teammates and learn about the community. lassonde.utah.edu/meetups

My U Signature Experience (MUSE): A database of research, leadership, community engagement, scholarships and internship opportunities across campus. muse.utah.edu

Opportunity Quest: A business-plan competition for students across the state, addressing the executive-summary stage of business development. lassonde.utah.edu/oq

RoboUtes: Students interested in robotics participate in competitions. roboutes.utah.edu

Sorenson Center for Discovery and Innovation: Helps unleash the creative genius within the U and the community to innovate the way we live, work and play. bit.ly/sorensoninnovation

SPARK: An online community all about ideas — inspiring students to collect, sort and finally implement them. spark.utah.edu

Sustainability Scholars: Students work across disciplines to research, imagine, create and implement strategies that will positively affect sustainability practices at the U. bit.ly/sustainabilityscholars

Sustainable Campus Initiative Fund Program (SCIF): Innovative and motivated students are awarded grants to team up with a faculty or staff member to bring about sustainable changes to the campus. bit.ly/sustainablefund

The Gapp Lab: A student game-development center for health-related video games and apps. eae.utah.edu/the-gapp-lab

Undergraduate Research Opportunities Program (UROP): Students are paired with faculty members and work closely with them in research experiences. urop.utah.edu

University Venture Fund: Students work with entrepreneurs and investors to learn about investments and see how successful companies are managed. uventurefund.com

Utah Entrepreneur Challenge: One of the largest business-model competitions in the nation. Students across Utah develop full, comprehensive business model. \$40,000 grand prize. lassonde.utah.edu/uec

Utah Real Estate Challenge: Real-estate development competition for undergraduate and graduate students throughout Utah. bit.ly/realestatechallenge

Workshops: Attend regular workshops at the Lassonde Institute to learn new skills. lassonde.utah.edu/workshops

Something Missing? Do you want to add something to this list? We want to hear from you. Email us at lassonde@utah.edu.

