Applied Research Project Success Stories

Creating vital links between students, professors, and the community Sheridan serves

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Sheridan Undergraduate Research Support

Sheridan Undergraduate Research would like to thank the following agencies and supporting organizations for helping build a culture of innovation for our students and community:
Message from the Dean

A record of applied learning, creative vision and service excellence has made Sheridan a trusted partner and leader in applied research within our local communities, Ontario and throughout Canada.

Through innovative partnerships with small, medium, and large industry and community collaborators, we provide our partners with access to the talent, equipment and facilities that they need to make their ideas a reality, and minimize the risk in exploring new concepts and technologies.

This book highlights a selection of our numerous research success stories. It illustrates the many forms that research activity can take – and the various ways in which research experiences enhance the professional education of Sheridan students while driving local economic success.

Dr. Darren Lawless
Dean, Undergraduate Research

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At Canada’s largest movie studio lot, Sheridan co-op students are busy developing new software alongside industry clients, helping create a major collaboration tool for the province’s screen industries, and researching the latest in film capture and processing technology.

It’s all part of their placement at Sheridan’s Screen Industries Research and Training Centre (SIRT).

Sheridan established the Centre in 2010 in response to strong demand from industry for a strategy to help companies in this sector tap into the expertise of the College in order to solve problems, explore new technologies, and become more innovative – and more competitive. Under the direction of former Faculty of Animation, Arts and Design professor John Helliker, SIRT has become a major player in Ontario’s screen industry, acting as an expertise hub, technology access centre, and collaboration facilitator. The mission of SIRT is to help bring Ontario’s screen industry together, facilitate productive collaboration and infuse their projects with new tools and skills. Students and faculty researchers work on research and training projects with industry partners exploring the digital workflow, virtual production and previsualization, stereoscopic 3D, 4K, high frame rate (HFR), and much more.

SIRT has become a destination for Sheridan students from all disciplines looking for a unique real-world challenge as part of their co-op or internship placement.

“Hard-working, talented students are an extremely important part of SIRT and our success to date,” says Helliker. “The mix of students at SIRT mirrors the mix of project teams in this industry – we’ve had students from project management, computer programming, business administration, advanced television and film, animation, illustration, and communications programs all contributing to our work with industry partners.”
A recent group of co-op students, from Sheridan’s School of Applied Computing, tackled projects that enhanced their industry partner’s work, and also helped continue to build SIRT’s capacity for excellence.

THE MARZ ONLINE EDITOR

Cullen McLaren and Jun Ko, currently enrolled in Sheridan’s Systems Analyst (SA) and Software Development and Network Engineering (SDNE) programs, worked with Toronto-based studio MARZ (Monsters, Aliens, Robots and Zombies) to create the proof-of-concept for the studio’s anticipated cornerstone product: a browser-based video editor aimed at helping horror and sci-fi fans create their own short movies. MARZ was impressed with Cullen and Jun’s work, and plans to continue development towards a first beta version for their niche market.

“This MARZ-Sheridan collaboration is a model for future efforts,” said Ryan Stasyshyn, Project Manager at MARZ. “The efforts of Cullen and Jun cannot be underestimated in their skill and enthusiasm while working in conjunction with the MARZ team and Sheridan staff. Their achievement is a testament to the possibilities of institutional and private sector cooperation.”

BUILDING SIRT’S CRM SOLUTION

In order to help SIRT keep up with its growing client relations, project management, and reporting demands, the Centre brought on Randy Beard and Roman Nahovitsyn, also from the SA and SDNE programs, to customize a popular Customer Relations Management (CRM) tool to make it work for SIRT. Working closely with SIRT operations management and business development staff, Randy and Roman built custom reporting plugins, analytics and workflows for the program in order to provide a more user-friendly and visual experience. “This was my first real IT job, and it challenged me to manage changing client requirements, address wrenches thrown into gears, and work with a team for an extended period of time,” said Randy.

With their help, SIRT is now better equipped to manage complex project data for its growing list of clients.

REMOTE COLLABORATION PLATFORM

For a pivotal new industry remote collaboration project, SIRT tapped into the expertise at Sheridan’s Information Systems Security (ISS) program. ISS student Don Lazic went straight to work with both SIRT and Sheridan’s Information Technology staff, along with major technology providers in Toronto. With Don’s expertise, the team made significant advances on the front and back ends of the complex network, which will connect soundstages, postproduction and visual effects studios, and any other companies working simultaneously on a film, TV or gaming project. “The best part of the experience was working so closely with industry right from the project start,” said Don.

The network has launched, and SIRT is also working with a Sheridan illustration student to prepare the first set of marketing materials.

As SIRT continues to grow, its expanding range of projects has been largely shaped by the dedication and enthusiasm of the students who have helped make them successful, as well as close feedback from industry partners. The SIRT team looks forward to welcoming new co-op students from across disciplines, and continuing to infuse their expertise into the Centre’s capacity to boost local screen industry innovation.
Transforming Business Education at Sheridan

Is there a better way to teach business? Sheridan thinks so, and with a research grant from the Ontario Ministry of Training Colleges and Universities, Sheridan is exploring new teaching techniques that could produce truly creative business leaders.

The traditional classroom setting can be dull. Students become uninspired simply listening to lectures or watching presentations. Such an environment doesn’t offer much to encourage new ideas and innovations.

To better motivate and engage students, Pilon School of Business professors Dr. Ginger Grant and Golnaz Golnaraghi used the Ministry’s $250,000 Productivity and Innovation Fund grant to explore a shift in teaching – one that moves away from lectures to a more interactive environment where the students do the intellectual heavy lifting and rely more on their personal experiences.

“We want to move from the ‘sage on a stage’ classroom to the ‘guide on the side’ so that we’re collaborating with students instead of instructing them,” said Ginger.

The two professors, with involvement from other Pilon School of Business colleagues and a Faculty Librarian, developed a transformational learning model drawn from an extensive review of teaching methods used around the world. They then injected this model into two business courses: Leadership and Development, and Creativity and Innovation in Business. More than 400 students learned using this transformational model over a 14-week period.
One of the elements of this model, explained Golnaz, was challenging students to solve real-world problems. For added authenticity, industry experts were invited to voice their challenges. The students had to find solutions, present recommendations and defend their findings to a company’s top executives.

Another element of this model was an emphasis on self-reflection – encouraging students to think about who they were, their experiences, their talents, their passions and how those could be applied to their course work.

“When students reflect on their experiences, it allows them to deepen their learning,” said Ginger. “Their own experiences are a source of creativity for problem solving and new thinking.”

To assess the students’ reaction to this model, the two professors and their research team conducted an extensive literature review. They also administered a survey and held focus groups to gauge the students’ experiences. The survey results painted a very clear picture. One student responded, “This is the first course I’ve ever taken where I’ve not learned from a textbook, I’ve learned from my life.”

Sumayya Daghar, one of the student research assistants, benefitted from this project in multiple ways. She helped the professors gather information with her focus being self-reflective practices. “It was a great experience, working as a team, as an equal with your professors,” said Sumayya, who enjoyed the flexibility she was given to find creative ways to collect and present information. She also feels she is now much stronger at retrieving information, even when there appears to be dead ends.

Sumayya also took the classes where this transformational teaching model was tested and found learning this way was unlike anything she had experienced before. “Having that real world involvement in the classroom was so empowering,” she said. “You’re moving away from text and theory to practical experience.”

Sumayya, who graduated from Sheridan’s project management program, loved how the instructors in this program were more mentors than professors. “You have to figure it out, because they’re not going to give you the answers,” she said. “It was a challenge to think on your own and take ownership of your decisions.”

She also found the self-reflection component invaluable. “When you’re aware of who you are, what your values are, you’re more authentic and when you do that you’re more confident,” she said.

With this transformational learning model validated, it’s now being embedded into Sheridan’s five new Bachelor of Business Administration degree programs which launched in September 2014. Ginger and Golnaz are pursuing other grant opportunities to continue exploring the transformational learning model.

“The grant support was just the beginning,” stressed Grant. “We’re creating a classroom experience that engages the student emotionally as well as intellectually.”

Funding for this project generously provided by:
Who hasn’t taken a picture or video of themselves and been disappointed with the result? Photos with heads cut off, images that are out of focus, videos with too much shaking… they all fall victim to the ‘delete’ button. Sometimes it’s mildly annoying. But often it’s downright frustrating because a precious moment or memory is lost.

Keizus Inc., a Toronto-based start-up that designs and sells accessories for smartphones, tablets and cameras, had plans to develop the Quadrapod + Clamp to eliminate such hassles. It’s a plastic tripod device that looks like a human skeleton with extremely flexible joints that can be moved into an unlimited number of positions to securely hold and mount smartphones, tablets and cameras. It’s ideal for taking great self-portraits and videos, and for watching video content on tablets.

But before Keizus could make its product market-ready, it needed help developing 3D prototypes in a short period of time. “We needed to visualize the product,” said Keizus Chief Technology Officer, Alex Zouev. “You can simulate product design on a computer, but there comes a point where you want to see it and touch it with your hands.”

“This type of 3D printing equipment is normally reserved for large companies,” said Dr. Farzad Rayegani, Associate Dean of Sheridan’s School of Mechanical and Electrical Engineering and Technology. “No other post-secondary institution in Canada has this system. The 3D printing of advanced functional prototypes is often the missing piece small and medium companies need to move forward.”

Sheridan’s cutting-edge resources certainly advanced Keizus’ design, as only after a 3D model was in his hands did Alex realize critical revisions had to be made.

Keizus partnered with Sheridan College through the Federal Economic Development Agency for Southern Ontario (FedDev Ontario) Applied Research and Commercialization (ARC) Initiative. The ARC initiative matches small- to medium-sized companies with Sheridan faculty and students to conduct applied research, development and innovation activities that help companies become more productive, competitive and ultimately create jobs.
Funding of up to $100,000 is matched by 50% in cash or in-kind contribution by the participating company.

3D PROTOTYPING AT SHERIDAN

Under instructor guidance, Keizus worked with Monika Kucharska, a student at Sheridan’s School of Mechanical and Electrical Engineering and Technology (MEET) who made adjustments to the prototype design, prepared drawings of parts for manufacturing, worked on packaging design and assisted with some of the 3D printing.

Fellow student Amanjot Singh helped design fixtures to be used in the products’ manufacturing and assisted with the 3D printing as well. The project gave both students invaluable exposure to the task of engineering product design while considering manufacturability.

CREATIVE FREEDOM AT WORK

Alex was impressed, and a bit envious, of the students’ creative freedom. When brainstorming, “they didn’t have to worry about budgets, markets or investors,” said Alex. They could just freely exchange innovative ideas without outside interference, and that, stressed Alex, is why they made such a positive contribution.

The culmination of everyone’s efforts was the commercial launch of the Quardrapod + Clamp in July 2013. Weighing just 0.3 pounds (120 grams), it’s small, light and ideal for smartphones such as iPhone, Samsung Galaxy, HTC, and Sony Ericsson. It’s also perfect for viewing tablets like Apple’s iPad or the Samsung Galaxy Tab.

For Keizus, Sheridan’s resourceful faculty, advanced 3D printing equipment and enthusiastic students were picture perfect.

“Working with Sheridan was fantastic – their resources are readily available and it has one of the most sophisticated facilities for printing in 3D.”
- Alex Zouev, Chief Technology Officer, Keizus Inc.

Funding for this project generously provided by:

[Images of funding providers]
Standing in front of an audience of vocal and potentially critical at-risk youth, Katrina Ennamorato was nervous.

“It was a totally new experience pitching an idea and having no predetermined expectation with how they’re going to react,” said the Sheridan Furniture Design graduate. “You’re forced to have confidence in your ideas.”

Quickly finding that confidence, she presented her designs with conviction. That experience will benefit her as she embarks on her career, having just completed the Furniture Design program this spring.

Katrina and 16 other furniture design students from the Faculty of Animation, Arts and Design (FAAD) completed their final year-end project that involved designing furniture pieces for the YMCA’s Vanauley Street youth shelter and drop-in centre. Sheridan instructors Peter Fleming and Connie Chisholm conclude the students’ studies with a real-life, experiential learning assignment and connected with the YMCA who were working with Hilditch Architects to renovate a youth shelter and wanted to include new furniture. (Up to 20-80 youth use this shelter to search for jobs, write resumes, spend time with counselors or to take part in social activities – all with the goal of helping them transition away from street life.)

The students designed and built 20 pieces including couches, lounge seating, tables, computer stations, entertainment cabinets and side tables – that was Katrina’s assignment. The students met with the youth and YMCA staff and heard their ideas, concerns and wishes as part of their project research, and returned to Sheridan’s furniture workshop to develop some designs. At subsequent meetings, discussions were tough.
The challenge for Katrina and her classmates was coming up with designs that struck a balance—the pieces had to be warm and visually pleasing, but also durable and versatile. They also had to be designed in such a way that the youth felt their ideas were heard. “You have to try to address the core wants and mold it into something that makes sense,” said Katrina. “You have to be open to changes and you have to make compromises.”

For Katrina’s six side tables, they had to be solid enough that someone could sit on them, or eat off of them, but they also had to be light enough to be easily moved around. She used a material called Corian, for the side tables’ surface with a wood frame. Often used for counter tops, Corian is stain resistant, tough, can withstand a lot of abuse, and yet it’s pleasing to the eye.

As each piece came together, Peter was gratified to see how the students matured over the course of the project. “I saw a tremendous level of growth in confidence,” he said. “They already know how to design and build furniture, but this project showed them how to present their concepts cohesively, how to carry themselves in a client meeting, and how to read cues from clients and absorb them into their practice.”

Katrina’s side tables and all of the other pieces are now finished and will be unveiled at a ceremony when the shelter’s renovations are complete.

“Our goal was to create spaces that give these youth a sense of dignity and safety,” said Katrina. “With our designs, we want to help turn this shelter into an environment that encourages them to move toward their next stage in life with the YMCA’s support.”

“...This project showed [the students] how to present their concepts cohesively, how to carry themselves in a client meeting, and how to read cues from clients and absorb them into their practice.” - Prof. Peter Fleming, Studio Head, Furniture Design Program
For Mailennium, the phrase “there’s no room for error” couldn’t have more significance.

The Mississauga-based direct mail company collects information through mail-based surveys and evaluations, indexes and classifies raw data, and provides meaningful and intelligent data for its clients.

They work with a variety of sectors such as oil companies, the financial industry, companies wanting to know more about their customers, or organizations wanting to know more about their employees.

But there’s a challenge – errors.

Errors on surveys happen. Questions are sometimes answered incorrectly or misunderstood. And the more they happen, the more likely discrepancies interfere with quality client data.

In fact, there are two sources of errors, explained Mailennium President, Laura Artibello. There are those picked up when surveys are scanned digitally, and human errors that sometimes occur when an operator attempts to interpret what the digital scanners flagged.

**RESOLVING ERRORS, IMPROVING PROCESSES**

The company needed to put improvements in place to their current system that made errors easier to spot, and quicker processes to resolve errors once they were found.


The ARC initiative matches small to medium-sized companies with Sheridan faculty and students to conduct applied research, development and innovation activities that help companies become more productive, competitive and ultimately create jobs. (Funding of up to $100,000 is matched by 50% in cash or in-kind contribution by the participating company.)
SHERIDAN BUSINESS STUDENTS ROLL UP THEIR SLEEVES

Three students from Sheridan’s Bachelor of Business Administration – Global Business Management program, under the guidance of Professor Scott Hadley, brought a variety of skills including IT, marketing, research and analysis to the project.

The team developed a prototype measurement tool that complements the company’s current working system. It enables their digital scanners to identify errors faster and earlier, establish error trends across surveys, and create a detailed log of error patterns for both internal use and for customers, giving Mailennium a greater understanding of the accuracy of its entire survey process. For staff operators, better processes were also designed, giving them more confidence to identify errors and, just as important, make decisions faster to resolve them.

THE ENHANCED SYSTEM

Mailennium’s improved report system can now clearly provide factual and projected client data unique to each customer, as well as show potential clients how their surveys often remain within a one per cent error rate. (This was something the company knew thanks to client feedback, but couldn’t properly quantify.) “All of these improvements – enhancements to the entire system and process, from first touch to final output, add value which is helping us get to the markets we need to be in,” stressed Laura.

That value also extends to the students. “This project gave the students context to help them with further academic work, especially understanding that ‘applied knowledge’ is quite different from ‘book knowledge,’” said Scott. “They had to figure out what resources, new skills and knowledge were required to meet the goals and they learned the importance of communications skills through negotiating, setting up meetings, extracting information, and feeding info back to the company... that’s difficult to do in a classroom.”

“Sheridan provides a wealth of support – from the faculty guidance and follow through to pairing students to our organization.”
- Laura Artibello, President, Mailennium

Conversely, Mailennium’s offices briefly turned into a classroom for Laura and her staff, as they thrived on learning from Sheridan’s students. “They’re young, motivated and on the cusp of technology, skills, resources and current trends,” said Laura. “Sheridan’s positive energy impresses me each time I walk through the door!”

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- Federal Economic Development Agency for Southern Ontario
- Agence fédérale de développement économique pour le Sud de l’Ontario
We all sort through things – change, receipts, bills – but in the manufacturing sector sorting is a fundamental process that needs to be done as efficiently as possible, or else it will consume precious time and money.

Charlie Thai knows the importance of sorting to any manufacturing business. He’s the President and CEO of AVP Solutions – an inspection system company that develops automated sorting systems using lasers, electronic sensors and other advanced technologies.

Established in 1993 and now with eight employees, AVP’s main clients are auto part manufactures. But with the auto industry struggling over the past few years, Charlie needed to diversify and expand to new markets in order to remain competitive.

There are still industries that rely primarily on manual labour for sorting, and that’s where Charlie saw his opportunity. His vision was to create a new type of automated sorting line that worked on a conveyor belt. He knew his idea had potential, but he couldn’t pursue it because of a lack of resources and funds needed to cover the necessary manpower. For such an idea to take flight, blueprints would have to be drawn up and complicated tests would have to be conducted.

What he needed was talent, funding and an industry that could use such a technology. He found all three with Sheridan College and the Federal Economic Development Agency for Southern Ontario (FedDev Ontario) and its Applied Research and Commercialization Initiative.
The ARC initiative matches small- to medium-sized companies with Sheridan faculty and students to conduct applied research, development and innovation activities that help companies become more productive, competitive and ultimately create jobs.

It’s great working with people who have a passion for what they do. Sheridan’s hardworking students are eager to learn and their knowledgeable professors are committed to developing their students’ skills.”
- Charlie Thai, President and CEO, AVP Solutions

(Funding of up to $50,000 is matched by a 33% cash or in-kind contribution by the participating company.) Sheridan connected Charlie with a company that sorted recycled clothing, mainly by hand. Dividing the clothes by condition, type and size, their system was slow and costly, with constant bottlenecks. It could also be dangerous for the workers who were sometimes struck by foreign objects within the clothing.

Under the direction of Dr. Farzad Rayegani, P.Eng., a professor with Sheridan’s Faculty of Applied Science and Technology, six Sheridan students joined AVP for several months – a software programmer, as well as mechanical and electrical engineering students. “We’re trying to assist small- and medium-sized companies grow by helping them develop technology that’s accessible and affordable,” said Farzad. “These students used their fundamental engineering principles from their studies at Sheridan and rose to the challenge of implementing them in a real industry system.”

“They brought out fantastic ideas,” said Charlie, who has since hired some of the students full-time to continue working on this project. “They helped build all the prototypes, and many of the circuit boards and mechanical drawings were done by the students as well.”

The students’ contribution was instrumental in moving this technology from a concept to a marketable automated clothing sorting line that is faster, more efficient and can cut manual labour by as much as 75%. Plans are underway to make this system market-ready by early 2012. Elements of the students’ designs will also be integrated into AVP’s current technology, improving the company’s active sorting systems used by other industries.

“This technology has so much promise – it could be used for clothing, garbage and fruit, and several other possible industries,” said Charlie.

Funding for this project generously provided by:

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- Agence fédérale de développement économique pour le Sud de l’Ontario
When Cassandra Olguin held a human skull from the 16th century, she was understandably rattled. It’s not every day one holds the human remains of a person from hundreds of years ago. “This was once a living human being just like you and I,” said the 21-year-old from Oakville, Ont. who just graduated from Sheridan’s General Arts and Science program. “Working with skeletal remains was difficult and almost strange for me to wrap my head around, so I approached touching and feeling these bones with much caution during the first few weeks.”

But that nervousness soon passed, and led to interest and intrigue that became the starting point of a career. Cassandra was one of two students who volunteered to work with these remains as a research assistant under the guidance of Dr. Jaime Ginter, a Professor of Biological Anthropology at Sheridan College. The research project was part of Sheridan’s Co-Curricular Record program, which encourages students to explore learning activities in their desired field outside the classroom.
Dr. Ginter was able to secure a collection of human remains on loan from a respected museum in Munich, Germany. The collection consists of seven complete skeletons, as well as an assortment of bones of Europeans (from what is now Austria) from the 16th to 18th centuries.

The collection, along with an interactive application featuring 3D models of the remains currently being developed by Song Ho Ahn, a visualization researcher working in Digital Learning and Innovation at Sheridan’s Centre for Teaching and Learning, will be used in a forensic anthropology course taught by Dr. Ginter. “Having human remains at a college for the students to study and learn from is very rare,” explained Dr. Ginter.

For anthropologists and students, this collection is a gold mine to study our ancestors and learn about how we have evolved.

However, the collection arrived from its long overseas journey needing to be organized and cleaned so that the pieces could be used in teaching. So Cassandra rolled up her sleeves and helped identify the pieces, cleaned them, labelled them and when needed, reconstructed them.

“It was so hands-on. It was such a great learning experience;” she said. Amid this hands-on work, she learned about how remains can paint the picture of a population. By studying bones, it is possible to determine age, gender, height, body mass, diet, the general state of health and other characteristics of human remains.

As her supervisor, Dr. Ginter watched Cassandra’s knowledge of skeletons and skeletal remains skyrocket, as well as her comfort level and ability to take initiative. “Cassandra was also learning about organizing a collection, curating a collection and what information should be gathered,” said Dr. Ginter who added,

“I grew to feel much more confident in myself and in my abilities as a research assistant... the knowledge I’ve gained from working with Dr. Ginter will stay with me and benefit me greatly.” - Cassandra Olguin, Student Research Assistant

“It definitely expanded her knowledge base in anthropology.”

That knowledge base will soon be expanding even further. Cassandra found this research so engaging, she stayed on to help Dr. Ginter straight through the summer and has been accepted to the University of Guelph to study Anthropology this fall.

She’s convinced her work with Dr. Ginter and this collection helped her application stand out in this competitive program. She would like to focus on nutritional anthropology, exploring how food and nutrition affect our evolution.

“I grew to feel much more confident in myself and in my abilities as a research assistant,” said Cassandra. “I’m really looking forward to my next few years at Guelph. I know the knowledge I’ve gained from working with Dr. Ginter will stay with me and benefit me greatly.”
Whether it’s for movies or video games, shooting or developing material in 3D is expensive. Filmmakers and game designers know how easily three dimensions can add a whole new dimension of costs.

To ease budgets and tension Javelin Reality, the Virtual Reality department of Javelin Technologies, set out to develop a prototype for its “Previz” (previsualization) program. This software program can help film makers and game designers test and review scenes on their computers, giving them a “preview” of their 3D material before using specialized 3D equipment. This allows designers to construct a scene, arrange characters and sets and select camera angles, saving valuable time and money.

Javelin Reality didn’t have the expertise to develop this product in-house. This challenge set the stage for a partnership with Sheridan College and FedDev Ontario’s (Federal Economic Development Agency for Southern Ontario) Applied Research and Commercialization (ARC) Extension initiative.

The ARC initiative matches small- to medium-sized companies with Sheridan faculty and students to conduct applied research, development and innovation activities that help companies become more productive, competitive and ultimately create jobs. (Funding of up to $100,000 is matched by a 50% cash or in-kind contribution by the participating company.)

“Sheridan College was a great fit,” said Javelin Reality producer Ben Sainsbury. “They have an international reputation as one of the world’s best animation schools,” he said.
“The FedDev program definitely helped offset some of the risk of pursuing this new business venture.”

Sheridan assigned three programmers and a project manager from its Faculty of Applied Sciences and Technology (FAST) to work with Javelin Reality over the summer of 2012. Each brought a unique set of skills to tackle a crucial element of product development.

One developed a motion capture tool that records body movements that can be applied to animating characters within the program. The second worked on creating realistic virtual cameras within the program, so designers could get a preview of a scene from a camera on the ground, or perhaps from a crane. The third ensured the cameras behaved properly inside the program and developed editing options to tie all of these tools together.

“This was really an opportunity for the students to get involved in what they would do if they worked for a game company,” said Kevin Forest, a Sheridan professor with FAST.

Wanting to work side-by-side with the students, Javelin Reality even moved into Sheridan’s Applied Research and Collaboration Centre so that they could offer immediate feedback and maximize this partnership. That partnership included a bonus – going beyond the project scope, the students also created a mobile application that turns an iPad into a virtual camera.

Javelin has since demonstrated their prototype to a large online software distributor that intends to carry the company’s software tools. With a distribution channel in place, the company hired a Masters level programmer to help take the project from the prototype stage to a finished sellable product.

In November 2012, Javelin was informed that the prototype Sheridan students helped to build contributed to a Canada Media Fund (CMF) commitment of $450,000 in Cinema Suite, Javelin’s downloadable 3D animation production and editing application. In 2013, Cinema Suite, Javelin’s spin-off branch created to distribute the new product, entered into new partnership with Sheridan - this time, with the College’s Screen Industries Research and Training Centre.

“We are thrilled with our collaboration with Sheridan who was pivotal in the development of a working prototype of a solid product.”
- Ben Sainsbury, Producer, Javelin

SIRT collaborated with Cinema Suite to develop a set of 2D and stereoscopic 3D camera tools that are being integrated into the prototype, developed with FAST as part of the ARC initiative. Through the use of real-world camera features that accurately reflect the actual choices and variables present during production, the product will allow filmmakers to make better creative choices and save money by efficiently pre-planning their shots.

_Funding for this project generously provided by:_

[Image of logos for Federal Economic Development Agency for Southern Ontario and Agence fédérale de développement économique pour le Sud de l’Ontario]
Humber College instructor Odin Cappello walked into the lab of Sheridan’s Centre for Advanced Manufacturing and Design Technologies (CAMDT) and was amazed.

“They’ve got a lot of cool machinery that we don’t have at Humber,” he said. “It was eye-opening, and maybe there was a little envy,” he added, laughing. But this was no tour. This was business.

Odin, a professor at Humber College’s Industrial Design Department, was taking part in his first collaboration with Sheridan, made possible by the Ontario Centres of Excellence through its Voucher for Innovation and Productivity program. “I hadn’t had any previous experience with Sheridan, so I didn’t know what to expect,” Odin confessed.

Odin and students from Humber’s Industrial Design, Multimedia Design and Development, and Film and Television Production programs were working on an exciting new technology with Toronto-based start-up OOYAVAH.

They were developing a new iPad application and special screen that would allow a user to view in 3D without having to use 3D glasses, while still maintaining the touch screen navigation. The technology comes in three parts – a specialized iPad app, a case that the iPad slides into, and a clear plastic lens that slides over the iPad’s screen for 3D viewing.

This technology has so much potential. The pharmaceutical, medical and engineering industries are rubbering their hands eager to use it. Giving demonstrations at a molecular level, or anatomical level in 3D, or demonstrating machinery, tools, or architectural designs in multiple dimensions has obvious benefits.
OOYAVAH and Humber had developed the app, and then began designing the supporting case and lens.

Unsure of what the physical case would look like, the students moved through the design stages, from concept, to concept development, to initial prototyping, evaluation, and then further prototyping.

But they needed to physically test and evaluate whether their design was going to work. They needed a 3D printer to accurately print their model to determine whether or not it was going to be feasible.

Working with Dr. Farzad Rayegani, Director of the Centre for Advanced Manufacturing and Design Technologies within Sheridan’s Faculty of Applied Science and Technology, Humber’s team enjoyed a crash course in 3D printing, or additive manufacturing, as it is also known.

Several design modifications were made until the two colleges created a demonstrable prototype that OOPYAVAH can now shop around to potential manufacturers. It’s lightweight, easy to use and ergonomically sound. The lens produces bright colours and a strong 3D image. (The lens can also be conveniently stored when not in use.)

OOYAVAH hopes to find a manufacturer and have the technology market-ready in 2015.

“This was an incredibly positive experience,” said Odin. “As any industrial or commercial partnership goes, this was very smooth. Sheridan was super accommodating and I hope to work with them again. Obviously for both colleges the mission really is education and integration with industry, so it was also very hands-on and very fostering for students,” he added.

“It was great working with Humber,” said Farzad. “They wanted to learn and they were very approachable...for them additive manufacturing was a new area and they loved learning how to do it.”

“For Farzad, this collaboration bolsters CAMDT’s reputation as a technology hub for 3D printing, advanced manufacturing and robotics and automation. Further proof can be found in Farzad’s calendar, which is filled with meetings with universities, colleges and companies from across Canada wanting to tap into Sheridan’s expertise and resources.

“This technology hub is a playground for all stakeholders to come together in a risk-free environment to put together their minds and share expertise,” said Farzad. In this playground, Sheridan, Humber and OOPYAVAH have created an amazing new 3D experience.
For healthcare professionals, physiotherapists and insurance providers, the task of evaluating injured workers can be downright painful.

Functional capacity evaluations are used to determine if an injured employee (injured on or off the job) is physically ready to resume work. Used by employers and insurers, the current methods can take days to complete and be costly to the Healthcare system.

Kevin Cairns, President of Metriks Education, wanted to create a more time-efficient method that would result in cost savings and was equally thorough.

VALIDATING A NEW APPROACH

Getting injured workers back on the job has to be handled delicately and with sensitivity, but it also has to be done efficiently, explained Kevin. “It’s a complex issue – you’re dealing with fatigue, you’re dealing with musculoskeletal injuries... all kinds of issues.” Kevin believed his faster evaluation would be welcomed by current and future customers, but it needed validation.

“Whenever you do something like this there’s always questions about quality,” he said.

Though respected in his field, Kevin needed a reputable third party to show this shorter method worked. In collaboration with First Line Kinesiologists Inc., he partnered with Sheridan College through the Federal Economic Development Agency for Southern Ontario (FedDev Ontario) Applied Research and Commercialization (ARC) Initiative.

The ARC initiative matches small- to medium-sized companies with Sheridan faculty and students to conduct applied research, development and innovation activities that help companies become more productive, competitive and ultimately create jobs. (Funding of up to $100,000 is matched by 50% in cash or in-kind contribution by the participating company.)

Under the guidance of Dr. Mardy Frazer, Professor, four students from Sheridan’s Faculty of Applied Health and Community Studies were elected for this project.
Kevin’s evaluation was divided into four sections — lifting; reaching and dexterity; mobility; and grip and pinch strength. Each student was given a section to assess, though all four became familiar with the testing materials and equipment for the entire evaluation.

Conducting functional assessments on healthy College participants, the results varied slightly. But the overall results concluded that several days of testing were not needed – Kevin’s shorter evaluation would generate results just as accurate.

“Now we can say ‘Here’s the research that shows why this less expensive model is as good as a more expensive model,’” stressed Kevin.

STRENGTHENING STUDENT SKILLS

For Sheridan student Christine McLaughlin, the project strengthened her skills in areas such as analytical thinking, report writing and public speaking. “I conducted a lot of research on a variety functional capacity evaluations, work-related musculoskeletal disorders, as well injuries and occupational hazards,” she said. “By conducting the research myself, I gained a lot of experience in a field that many new graduates don’t have the chance to get.”

STAMP OF APPROVAL

With Sheridan’s solid research and data in tow, Kevin praised the students for increasing his chances of expanding his customer base in Canada, U.S., and Asia.

“The students always did what we wanted them to do – they always met their deadlines,” said Kevin. “And I was impressed with their overall level of confidence. I could tell from the research and the questions they were asking, they were really in tune with what was going on.”

Funding for this project generously provided by:

Federal Economic Development Agency for Southern Ontario  
Agence fédérale de développement économique pour le Sud de l’Ontario
NEXED Education: Educational learning tool is out of this world

Teachers Mark Wu and Peter Cameron were so passionate about developing a new web-based learning tool, they put down their chalk, left their jobs and formed NEXED.

Wu and Cameron (who are also parents of elementary school kids) believed technology wasn’t being properly utilized in today’s classrooms. Seeing the same old teaching materials used year after year, they set out to create NEXED’s flagship product, Answerables.

**CREATING ANSWERABLES**

Described as a digital learning ecosystem, Answerables is a futuristic virtual world with alien characters that provides a learning environment for students and teachers.

Within this intergalactic setting, teachers can insert lesson plans, quizzes and other materials for math, history, geography, English… pretty much any subject for a wide range of grades. The content could come from the web, or be something the teacher has created personally, with assignments becoming “missions”.

Equipped with a framework and some animated characters, NEXED was high on enthusiasm but low on budget, said Mark. They also needed game development expertise, and were on the hunt for a full-time game developer to really bring this program to life.

The ARC initiative matches small- to medium-sized companies with Sheridan faculty and students to conduct applied research, development and innovation activities that help companies become more productive, competitive and ultimately create jobs. (Funding of up to $100,000 is matched by 50% in cash or in-kind contribution by the participating company.)

**HARNESSING SHERIDAN TALENT**

Applied computing students from Sheridan’s Faculty of Applied Science and Technology (FAST) developed different concept games for Answerables’ “math zone”. A team of game developers and 3D animation artists first rolled up their sleeves and dove into a binder full of Ontario school curricula. “We had the students brainstorm with a slew of game designs,” said Patrick McKenna, Sheridan’s project leader, and a new faculty member teaching at FAST. “From that we picked eight games that we developed into prototypes that we integrated into Answerables.

That freedom enabled the students to be creative, and their performance reinforced Mark’s already positive opinion.

“Sheridan’s graphic designers, game developers and artists as well as their state of the art equipment are world renowned,” said Mark. “But what impressed me most was how the faculty and students went well above the technical scope of the project… Sheridan’s involvement was about a lot more than the work in the lab.”

NEXED also loved having access to Sheridan’s Applied Research and Collaboration Centre (ARCC) at the College’s Trafalgar Road campus, which proved to be a hotbed for ideas and collaboration. “We still go there to this day,” said Mark. “Even though the project has wrapped up, Sheridan still gives us a lot of support.”

**FULL STEAM AHEAD**

NEXED is charging full steam ahead and that includes hiring Patrick as the company’s lead game developer. “He’s had such a knowledge of the project from the ground up,” said Mark. “And his skills as a game developer are top notch…it would have been very difficult to replace him.”

Having completed internal testing, NEXED is now ready to test Answerables with the general public, offering a sneak peek on the company’s web site. Mark is confident that with Sheridan’s support and Patrick coming on board, Answerables is poised to make the grade.

“There’s a really strong sense that Sheridan wants to help your start-up become a successful business.”
- Mark Wu, Co-founder, NEXED

“For the students the sky was the limit,” continued Patrick. “They were able to create the games from concept through to completed prototype.”

**Funding for this project generously provided by:**

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Federal Economic Development Agency for Southern Ontario
Agence fédérale de développement économique pour le Sud de l’Ontario
The Sheridan Centre for Elder Research is helping older adults...as well juniors and sophomores.

The on-campus applied research and education resource centre conducts studies that enhance the quality of life for older men and women, as well as their families. Students supporting the Centre’s research have also found the experience pivotal in landing that first job.

Having passed its 10th anniversary in 2013, the Centre has established an impressive body of research that continues to have a tangible impact on older adults’ quality of life.

One 2007 study, funded by the Canadian Council on Learning, provided strong evidence for the power of lifelong learning that led to many of the Centre’s subsequent projects. This study investigated the learning needs of over 450 Ontarians 65+ through surveys, interviews and focus groups. The key finding: older adults want to continue learning, and this has significant impacts on health and well-being. However, they must be offered learning opportunities as well as the choice to learn in a way that is meaningful for them.

“It underscores our belief that you continue to learn whether you’re in a retirement home or a long-term care home,” said Centre Director Pat Spadafora.

Pat and Principal Researcher and Project Manager Lia Tsotsos are now working with a national retirement and long-term care home chain to launch an online learning community in B.C. and Ontario. Older adults in each community will meet separately on a regular basis to watch lectures and educational videos and then participate in an online, cross-country discussion as one group.
Another of the Centre’s foundational studies, funded through the Canadian Institutes of Health Research (CIHR) explored dance instruction as a way to encourage healthy activity in older adults.

That 2008 study involved Centre researchers designing, testing and evaluating a 12-week dance curriculum for older adults. Though designed for able-bodied older adults, it also has the flexibility to be used for people with mobility challenges or those suffering from early to moderate dementia.

Centre researchers tested the program with older adults living independently in the community, as well as older adults in retirement homes, long-term care facilities and assisted living homes.

“We observed meaningful benefits in all groups,” said Lia. “On top of increased strength and flexibility, we also found dramatic changes in mood as well as overall health and well-being.”

Since that initial study, the Centre’s dance curriculum has expanded to support older adults living with chronic conditions. Pilot studies in the fall of 2014 will explore how the program can be adapted for individuals with diabetes or Parkinson’s disease.

While perhaps not as visible, the Centre has also helped launch the careers of hundreds of students who have assisted Pat and Lia with applied research projects. Over 400 students have worked at the Centre over the past decade, ranging from volunteers to paid research assistants from a variety of faculties. “We’ve had a lot of students who have worked with us for most, if not all, of their time at Sheridan,” said Lia. “They get jobs after they graduate and credit working with us and working with real clients as one of the key reasons they were hired.”

Dilip Muthukrishnan is one such student. Completing his Software Development and Network Engineering program, Dilip has a job waiting for him as a full-time Programmer Analyst at Scotiabank when he graduates. He worked with the Centre in different roles for two years, beginning in 2012 when he was looking to kick start his career in IT.

He’s worked on several projects including supporting the Centre’s partnership with start-up PointerWare Innovations to develop an iPhone mobile version of popular applications specifically designed for older adults (and others) with limited computer experience.

“I have benefited enormously from working at the Centre,” stressed Dilip. “I learned many new technical skills via the projects I worked on. I also learned how to network and increase my exposure. It was mainly through the relationships I built with my colleagues at the Centre that I am where I am.”

Pat and her team look forward to the next phase of the Centre’s development. “We plan to grow our support network for small and medium-sized businesses and community organizations,” she said. “We also want to engage in even more innovative collaborations with Sheridan students and professors across disciplines, establishing our Centre as a resource for the whole Sheridan community.”
Sheridan Undergraduate Research

Do you have a problem that needs solving?

Sheridan Undergraduate Research would be pleased to discuss how we might help you innovate while providing learning opportunities for our students. Contact us to get started today!

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