Examples of Client Project Proposals

Device or Structure

- **Portable Collapsible Arrow Stand.** Kyudo is Japanese archery and has existed for hundreds of years. Today it is practiced as a martial art. The arrows used are 85 cm to 110 cm long and are cut to suit the individual shooter. They are placed in arrow stand(s) during practice with the tip down. There may be about 100 arrows placed in the arrow stand(s), where arrows are constantly being removed and placed during practice. The arrow stand protects the arrows and provides easy access. Current Problem: Kyudo practices sometimes take place in a rented gymnasium. Each time, needed equipment is transported to the location. The arrow stands currently in use were not intended to be portable and are bulky and heavy. Design Challenge: Design a collapsible arrow stand that would hold at least 100 arrows. The stand must be easy to assemble and stable with dividers that will keep arrows in small groups of 15 to 20 arrows. It must be easily collapsible to a size that is easy to transport. There must not be any loose hardware that could be misplaced. There must not be exposed metal parts on the interior surfaces that could damage the arrows. [An article about the ESP team’s completion of this project is on page 11 of the Japanese Canadian Cultural Centre August 2019 newsletter.]

- **Measuring the sweeping efficiency of curlers.** Curling is an Olympic sport that combines physical fitness, endurance, power, strategy and communication. An integral part of the game is sweeping, where curling brooms are used to sweep and melt the ice to affect the speed and trajectory of a curling stone as it travels toward the target. It is said that efficient sweeping - which combines a combination of pressure on the broom head and the stroke rate (speed at which the player sweeps) - can influence the distance of a stone by 10 feet or more. The Hong Kong Curling Team would like to measure the sweeping efficiency of its players using a device that can be fitted on a curling broom during practice and game play.

- **I'm looking for an eye tracking kit for under $400 that would enable a person with Lou Gehrig's Disease to communicate using a computer and communication software.** There are numerous eye tracking solutions out there. I would like a kit specification for tracker, computer, screen and mounting etc that would meet the needs of someone who has no mobility and limited funds. The kit should not only work and be affordable but easily maintainable and compact.

- **Infant Temperature Monitoring:** I need a way to measure body temperature of infants in a minimally invasive way that allows mothers to monitor whether their child is too hot. A safe sleep environment is suggested to reduce the potential occurrence of sudden infant death syndrome (SIDS) and the relationship to ambient or body temperature remains unclear.

- **Medicine Transport:** I need a way to keep medicine cool during air travel that keeps the medicine viable. It can be challenging for some people to transport the vital medicines that need to be kept cool, especially during long journeys that take place in an airplane. Therefore, we need a solution that is compatible with security screening requirements in airports and space considerations in airplane cabins.

- **Universal Baby Bather:** I need a way to wash a baby while they are slippery for a person who uses a wheelchair as a result of a spinal injury that is safe for both mother and infant. For the individual in a wheelchair, bathing is the most challenging aspect of infant care. There is a lack of available products that help wheelchair users bathe their babies safely and efficiently.
- Ultra-portable lap desk that fits easily into a backpack. Requirements: Made from panels that are slotted and can lock together through tongue-in-groove or another method. Other methods can be a folded design with an elastic material band to hold them together in a backpack, or snapping together.

Process or System

- Parts are typically ordered from electronic manufacturers. When these parts come in, they don’t get a proper storage place nor are they properly sorted unless we hand sort and put them away manually. This process is inefficient and error prone. This leads to a messier work environment, making it more difficult to access specific parts, and parts often get lost in the mix. We’d like to design an innovative way to organize and sort these parts so they are easier to find, retrieve.

- I have GPS data showing our deliveries over the past 5 years. Are we doing this efficiently, or could we improve? Looking at physical locations plus service issues (some need more service, some are harder to get to): what are the best routes we can make for our 3 vehicles. Knowing costs: should we have more or fewer vehicles?

- Creating an effective system for breaking down sheet goods (4ftx8ft sheets of wood etc) to smaller sizes (such as 24"x18") for use on the laser cutter etc. Considerations: 1) Limited space, means we can’t have a permanent set-up 2) Easy way to clamp guide rails to sheets repetitively and securely 3) Maybe can have multiple functions, and act as something else when not being used 3) Must be strong and sturdy to support heavy sheets

- Consumable materials inventory for our facility. Effective solution for keeping track of inventory of consumable materials, and a system for distributing them. Could also consider how invoices will be created and sent in an efficient manner. Could include hardware, software, etc.

- Emergency Response Planning for the campus of St. Michael’s College. Focus on development of contingency measures and other advance preparations to improve life safety, in response to high priority threats, such as fire, threatening people, utility outages, gas leaks, extreme weather, etc. Implementation of a cloud-based Emergency Communication System.

Energy, Environment, or Nature’s Complications

- We are a soon-to-open food Co-operative that includes a community kitchen for local food production. We also have a lot of refrigeration, with condenser units on our roof directly above our space. We need a design that can scavenge warm air from the condensers on our roof and use it to dehydrate local produce!

- We are an environmental student group called Dig In! Campus Agriculture. We are currently looking for individuals who would like to help us design and build an irrigation system for one of our on-campus gardens this spring. These gardens are a part of the Youth Food Centre, which holds weekly community meals.

- This project is to make a green-home out of an environmentally unfriendly townhouse. The design is to consider the leaky insulation on the walls, thermally inefficient windows and doors as well as floors. The goal is to propose a cost effective design that can provide a more environmentally friendly living area.

- In Canadian winter, if you parked your car out in the open on a snow day and forgot to lift your windshield wipers away from your windshield, a sudden temperature change can turn snow into ice and cause your wipers to stick to the windshield. Scraping them off the windshield usually results in damage to the wiper blades. I am looking for a simple, fool-proof solution to prevent wiper blades from sticking to the windshield due to ice/snow.
• Erindale United Church large multi-purpose room, Gardner Hall. Imbedded in the concrete outside the entrance doors are two drainage grates, designed to keep excess water from rising and seeping into the hall under the doors. A couple of floods of Gardner Hall were caused by leaves covering the grates, or the grates being iced over. However, more recently there has been flooding because of a torrential downpour that the grates couldn't handle. The grading around the church is such that it isn't easy, or perhaps even possible, to drain the surface water away from the area. What we are seeking is a cost effective solution that would eliminate the flooding of Gardner Hall, respect the properties of our neighbours and also comply with City of Mississauga bylaws.

• Tearing down or renovating a residential building generates a significant amount of waste. Currently the vast majority of that waste is thrown into a giant metal disposal bin and hauled away to the landfill. This process has both economic and environmental costs. If an owner of a residential home being torn down or undergoing a major renovation wants to minimize the environmental impact of their build/renovation through recycling as much of this waste as possible. What can they do? Likewise, the same owner would like to, where possible, reuse waste material from other construction projects. What can they do?

• Our sailing club - located on the Toronto Island - will eventually be in need of a new clubhouse. We believe our budget will be in the $100,000 range. Since we rent the land from the Toronto Island Marina, we are not allowed to build any permanent structures. The current clubhouse - which you have previously visited during a previous project - consists of a converted trailer. We have been brainstorming and thinking of ideas such as converting shipping containers and installing solar panels. We will send a more detailed list of our requests in the space. Our vision is that this new clubhouse - and surrounding area - could be an example of an off-grid, self sufficient and environmentally responsible as well.

Space or Accessibility

• Bikechain will be moving into a room in the new Student Commons building next year, with a projected opening of April 2019. The new space will be considerably smaller than our current location. We are seeking support to develop a floor plan that allows us to continue providing service at our current volume while also being AODA compliant. Important features will be accessibility, user friendliness and efficient use of storage space.

• To re-imagine and re-design Roncesvalles Ave into a more liveable pedestrian and cyclist friendly street, using Complete Street Guidelines as much as possible. ([https://www.toronto.ca/services-payments/streets-parking-transportation/enhancing-our-streets-and-public-realm/complesteets/completestreets-guidelines/](https://www.toronto.ca/services-payments/streets-parking-transportation/enhancing-our-streets-and-public-realm/completestreets/completestreets-guidelines/)).

• Redesign the kitchen and the outdoor walkway to accommodate a disabled person. Integrate Alexa device to manage apt heat/light.

• Yoga retreat farm design. As part of converting a farm into a new Yoga Retreat Farm, we would like to design a space for practicing yoga and meditation that is constructed to enhance the energetic experience of the participants through specific geometries. This space will be used for the summer, with a potential expansion for the winter, and could also include a lower level. It must be able to hold 40 people within the practice space and 40 people within the meditation space. This space must have a fireplace area in the centre of the practice space and a crystal will be placed in the centre of the meditation space. This facility will be open and welcoming to all peoples of different walks of life and faith systems. The overall project is a community initiative, organized and run by youth groups and other volunteer groups.