2014 Capstone: Entrepreneurial by Design, Mechatronics Program Project List

#	Project Title	Website	Description of Project	Group Members
1	Hydrocarbon Emissions Detection Device (HEDD)	http://plumeofgas.weebly.com/	An open-path measurement device for detecting hydrocarbon emissions. This device is the key for tomographic purposes and creating a 2D profile of composition of hydrocarbons over large gas tanks. The targeted hydrocarbons from oil refineries contribute to second highest greenhouse gaseous emissions in Canada. Being able to monitor the emissions will improve manufacturing efficiency, reduce health hazards and promote better energy policy.	Nick Bodd, Ali Jahed, Shari King, Peter Robertson
2	Aceso Labs: Monitoring the recovery of Post-Concussion Symptoms with a novel Biometric Suite	http://acesolabs.wordpress.com/	This device records and tracks the biometric data of a patient recovering from concussion, including center of balance and reaction speed, through a various set of tests. Then, using correlation algorithms and comparisons to known concussion behaviour, the device estimates the condition of the patient, and gives the doctor an objective metric to determine if it is safe for the patient to return to physical activity.	Xi Cheng, Peng-Lin Lu, Gregory Mark, Kevin Yang, John Zhao
3	Bread and Butter: A Modular Robotics Kit	http://david-shin.com/breadandbutter/	Bread and Butter is a platform that gives you the tools to develop your robotics projects regardless of your background. Bread and Butter targets the three main disciplines of Mechatronics Engineering (Mechanical, Electrical and Software), at configurable skill levels, and aims to empower you to further your interest and abilities in robotics.	Jake Chapeskie, Yang Lu, Hajra Shafiq, Donghyun Shin
4	Patient Lift Assist	http://www.eng.uwaterloo.ca/~a9richar/index.html	Our project aims to improve on patient lift designs. Our design adds a number of safety features that prevents the patient form running into obstacles, and it will only lower the patient onto safe surfaces such as beds and chairs. Our design also uses an interface that allows the patient to operate it while sitting in the sling. If some other enhancements are made, such as a sling that can also be used as a bed sheet (which is NOT part of this project), then our design can be fully operated by the patient, removing the need for a nurse or caregiver.	Peter Brown, Sarah Lucie Mayer, Andrew Richardson
5	Line it Up	http://mapps2014.wordpress.com/	The project entails an autonomous robot capable of demarcating (lining up) open spaces using paint. Such open spaces including but not limited to sports fields, parking lots, and construction sites.	Vanna Chan, Serena Foo, Nabeel Syed, Cyrus Yau
6	Pulse Punch Bag	http://futureoffight.com/	Our product is an exercise device for people interested in leaning the basics of martial arts. The system is an interactive smart punching bag with an online ecosystem that provides cardio workouts and improves the users fighting technique safely, enjoyably and all without the need for a personal trainer.	Saluka Amarasinghe, Fiona Chui, Adam Craig, Filipp Demenschonok
7	Kinetic Supplements	http://kineticsupplements.com/	Kinetic Supplements is a new style of vending machine that mixes and dispenses protein powder.	Yasser Al-Khder, Drew Gross, Jake Nielsen, Sean Wilkinson
8	PilledIn	http://www.pilledin.com/	PilledIn aims to improve the prescription filling process. By creating a fully automated pill dispensing network, we can greatly reduce the time and improve the accuracy of filling a prescription.	Tayler Dellandrea, Brody Langille, John Waenink, Michael Weingert
9	CaseSensitive: Smart Luggage	http://case-sensitive.weebly.com/	?CaseSensitive?, is the next phase in smart-luggage technology. It is designed to improve the quality of travelling with checked luggage while improving airlines baggage handling.	Stephen Kraemer, Bilal Maassarani, Bryan Nagallo, Kalman Sobel
10	Collabr: Interactive Multi-Touch Table	www.collabr.me	Our project is an interactive table that allows users to push content from their personal devices on to the table and collaborate with others. Users can manipulate content together, and can then pull revised content back to their devices.	Anthony Chuang, Jin Sung Kang, Rahul Udasi, Bhavik Vyas, Qiming Yang
11	Cyculus: Virtual Reality Mountain Biking	http://panache.github.io/cyculus/main.html	The Cyculus is a virtual reality indoor exercise machine designed to make working out fun and exciting. We have created an actuated biking machine that connects with a virtual world that users can explore.	Jasper Fung, Kornel Niedziela, Leigh Pauls, Akash Vaswani
12	Haptic Feedback Device for Robotic Manipulators	http://generalhaptics.wix.com/group12	This device enhances the control of a robotic manipulator. Specifically, it provides force feedback to a user's hand and forearm. The user will be able to experience the forces encountered by the manipulator when it is either traversing obstacles or directly manipulating objects.	Jawad Ateeq, Yifei Cheng, Haris Khan, Bongkyun Park
13	Junomo: Receipt Analysis Systems	www.junomo.com	The goal of our product is to reduce receipt clutter and present personalized and meaningful expenditure data that can be used to analyze how you spend your money.This product aims to extract data from receipts and quickly present relevant information to the user and stores them as images.The images are then processed and text is extracted to be used to provide analytics and insight into expenditures allowing you to make better choices and improve your quality of life.	Brendan Chwyl, Dylan Drover, Benjamin Kiefer, James Maxwell
14	Automated Warehouse Solutions	http://p2z2systems.wordpress.com/	Our robot would allow warehouse shelving structures to be re imagined from the ground up. Instead of distinct shelves, separated to allow forklift access, shelves would be large surfaces maximizing storage space and providing easy access for robots. Lifting mechanisms will allow robots to safely transition between levels. Because the shelves will be structurally similar to floors, robots will be just as well equipped to navigate normal warehouse levels as well. There will be multiple induction stages interfacing the trailers to the robots that provides warehouses a smooth transition to the new technology.	Howard Pang, Daniel Park, William Zhao, Meng Xi Zhu
15	RECAT Robotically Enhanced Choanal Atresia Treatment	http://recat.wordpress.com/	Choanal Atresia is a rare congenital disorder that affects 1 in 7000 newborns in North America. The disorder results in the blockage of one or both nasal passages of a newborn. The purpose of the Robotically Enhanced Choanal Atresia Treatment (RECAT) project is to treat Choanal Atresia in a minimally invasive and time saving manner.	Alan An, Danny Chan, Mark Shen, Jonathan Wu
16	High flyer: The Autonomous Mobile Airship	http://m54518.wix.com/high-flyer	This project looks at the feasibility of uses of static and slow moving aerial vehicles as a platform for computing and information gathering. Potential uses include radio rebroadcasting, surveillance, and general information collecting.	Patrick Ellsworth, Milan Stanivuk, Markus Anton Fuch Trapp, Jianing Wang
17	ScanMe	http://saadahmad.ca/fydp/	Our 4th year project is to scan 3D models of people and generate an animatable character. This can be applied in many different ways such as fitting clothing on people and creating in game-characters.	Saad Ahmad, Teresa King
18	Ares Swarm Drone	http://ares-swarm.enjin.com/	The Ares Swarm drone aims to develop an autonomous swarm surveillance system that maximizes reconnaissance effectiveness by reducing costs, expanding patrol ranges, and prevent troops from taking unnecessary risks.	Terry Fung, Yan Peng Li, Chris Woo, Chi Zhang, Ying Zhao
19	Raven Motion Capture System	http://dansulpizi.com/raven/index.html	A human motion capture system to inexpensively and easily record a person's movements in 3D space. The system utilizes inertial measurement units and kalman filtering for fast, accurate measurements.	Nicholas Moore, Jonathan Nivet, William Richards, Daniel Sulpizi
20	Automated Medication Dispenser	http://www.eng.uwaterloo.ca/~cschhom/index.html	Our project consists of a machine that will dispense medication directly to patients. Patients will scan their ID tag at the machine when it is time for them to receive their medicine and the machine will provide the medicine in the appropriate dosage.	Chetsovann Chhom, Paul Diep, Thanuja Jinadasa, Nirothayan Yogaratnam
21	Autonomous Underwater Tracking System	http://www.eng.uwaterloo.ca/~yz4wang/index.html	The Autonomous Underwater Tracking System will in theory be able to track a diver, monitor and warn them about potential dangers. The primary focus will be the tracking of a diver with other features being secondary.	Yang Ding, JiaCheng Hu, Benjamin Quinn, Yanzhuo Wang
22	Videography Automation System	http://www.eng.uwaterloo.ca/~s89kim/DesignProject.html	An automatic camera recording system is designed to meet the needs of presenters wishing to film their presentations without the use of another human camera operator. The solution allows the presenter to intuitively control an actuated tripod platform with an infrared remote. The system can be applied to business, personal and lecture presentations.	Sangwoo Kim, Haonin Li, Sihang Lu, Christian Muggeridge
23	Motorized Skateboard	http://www.eng.uwaterloo.ca/~kclaw/	A turning-assisted electric skateboard takes you to your destination in style. Simply step on the board, relax, and let the electronics handle the rest.	Kevin Cheung, Anurag Dosapati, Calvin Law, Eric Yam
24	LifTrax: Automated Weightlifting System	http://liftrax.net/	LiftTrax is an advanced weightlifting machine with active automation technology. It can measure the weights the exerciser uses as well as count the workout reps. An integrated user interface allows each user to track workout progress. Additionally the machine has an active spotting system that detects when the user cannot complete a rep and reduces the resistance gradually until user can continue.	Mohammad Bdeir, Ezzat Elokda, Ahmed Hamdy, Kuber Singh
25	RATAR (Rescuer Assistance Through Autonomous Robotics)	http://www.eng.uwaterloo.ca/~jvanoort/	The RATAR system utilizes one or more semi-autonomous robotic platforms to explore disaster areas and collect information to assist rescue personnel.	Christopher Au, Derek Chow, Muny Tram, John Van Oort
26	Automated Swimming Pool Chemical Control	http://autobalancedpools.wix.com/automated-pools	The automated swimming pool chemical control system is designed to improve water quality in swimming pools by automatically maintaining optimal chemical conditions in the water. Using a combination of sensors and actuators the control system is capable of maintaining chemical setpoints and shocking the pool.	Biye Chen, Max Haringa, Andrew Neves, Michael Van Dorp
27	Statera Labs: AutoBalancer	http://stateralabs.com/	Electricity is generated and delivered using three distinct phases. Imbalances between these phases cause accelerated wear on components and losses of energy/money. By implementing a solution that enhances a standard home's breaker into an intelligent balancing source, hundreds of dollars are saved for the consumer and thousands are saved for the supplier.	Waleed Khan, Alexander Rohan Martanda, Christpher Wehbe, Austin Wu
28	Development of a Low Cost Blind Aid Device	http://www.mapomatix.com/	We are developing a low cost blind aid device. This is made possible by the development of a revolutionary new type of low cost laser distance sensor which maps the surrounding environment. This data is then interpreted and audio feedback is provided to the user.	Jacqueline Fromme, George Jose, Hongsik Moon, Sohaib Qureshi, Zhiqian Zhao
29	Vibrotactile Sensory Substitution Hearing Device (VTSSHD)	http://www.eng.uwaterloo.ca/~aleblanc/FYDP.html	The VTSSHD is to be used by individuals suffering from severe hearing impairment. It strategically maps incoming audio to an array of piezoelectric vibrotactile actuators on the user's skin, permitting him or her to perceive sound using the sense of touch, eventually allowing him or her to recognize and produce phonemes and speech.	Alex LeBlanc, Chinmay Raval
30	MEMS Based Atomic Force Microscope	http://nano-i.weebly.com/	This project demonstrates scanning and producing nanometer resolution images of surfaces using Atomic Force Microscope technology. It uses a MEMS device with built in actuators, sensors, and a device tip for scanning, and vastly improves from a traditional AFM design by reducing cost, size, and portability.	Rohaan Hamid, Bilal Junaid, Mahdi Olfat