THE FREQUENCY

FLIPS TIPS AND TRICKS

APRIL 2024 EDITION

DOES ENG HAVE SHOE GAME?

Big Moves from our Eng Students

EDITOR'S NOTE

Hello Fireball Family,

We are back with our winter edition and with exciting articles for you to read! Did you miss out on the Designation this year? Check out page 3 to learn more. Want to learn more about technical teams such as RoboMaster? Check out page 7. With exams coming up, we have some useful study techniques for you to test out. Are you looking for new ways to stay on top of your work? Skip to page 16. For more information on how important physical activity is for your mental health visit page 19.

If you have any concerns or comments please reach out to our email at frequency@macengsociety.ca

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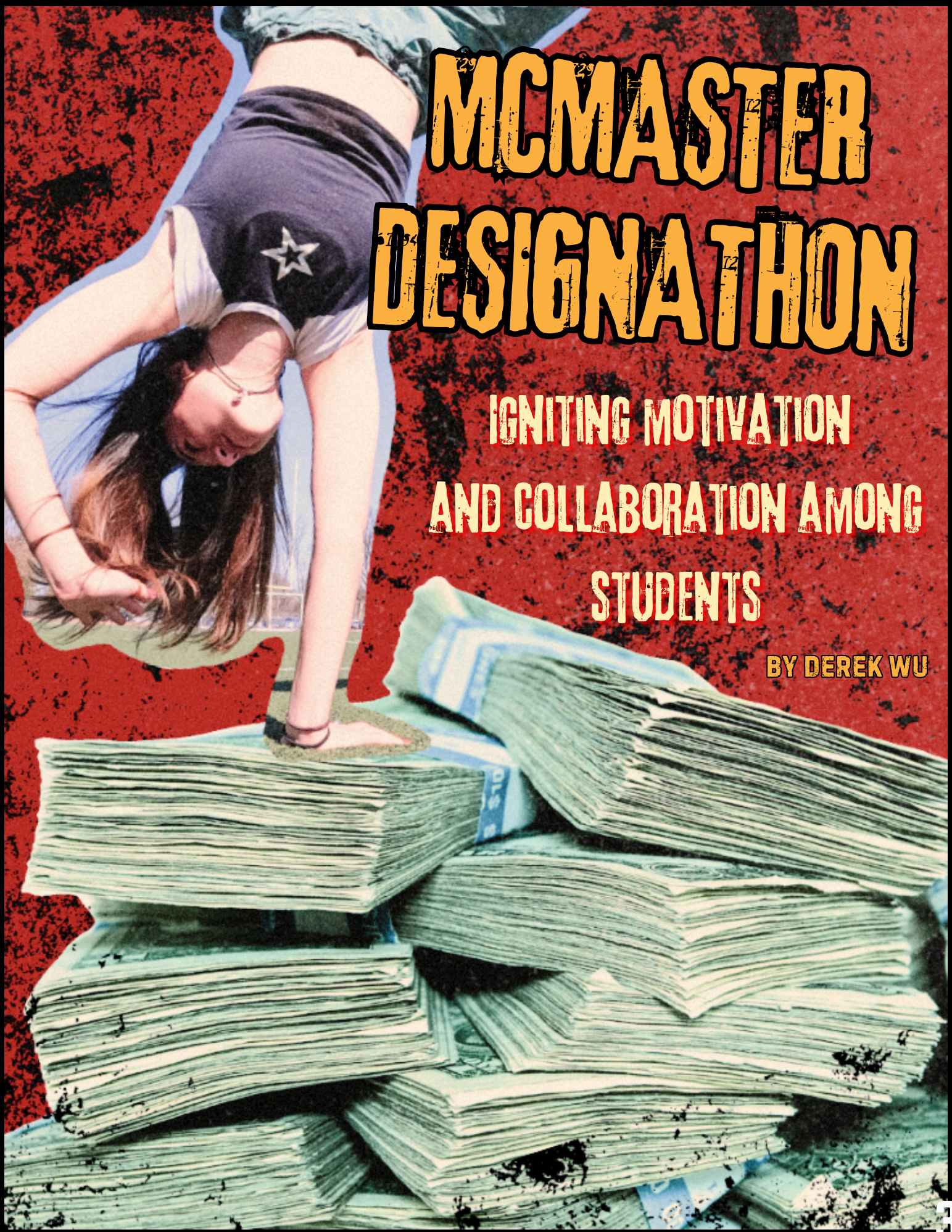

MCMASTER DESIGNATHON
IGNITING MOTIVATION AND COLLABORATION AMONG STUDENTS
BY DEREK WU

On January 20-21, McMaster University's campus was alive with energy and creativity as it hosted its annual Designathon, a competitive yet collaborative event drawing students from various disciplines to design, innovate, and solve real-world problems within a tight 24 to 48-hour timeframe.

The event, which has rapidly become a highlight on the university calendar, saw participation from over 200 students ranging from first-year undergraduates to final-year postgraduates. Teams were tasked with developing innovative solutions to pressing issues such as climate change, healthcare, and digital education, reflecting the Designathon's commitment to contributing positively to society.

The Designathon kicked off on Friday evening with an opening ceremony that included motivational speeches from industry leaders and McMaster alumni. Participants then formed teams and received their design challenges, with the clock ticking down from that moment on.

"WE'RE AMAZED AT THE CREATIVITY AND DEDICATION OF THE STUDENTS."

"THEY'VE TAKEN ON SOME OF THE BIGGEST CHALLENGES WE FACE TODAY AND APPROACHED THEM WITH FRESH, INNOVATIVE SOLUTIONS."

- Dr. Alex Chen, one of the event organizers.

"THE DIVERSITY OF IDEAS AND THE LEVEL OF EXECUTION WE'VE SEEN THIS YEAR IS TRULY INSPIRING."

Throughout the event, the university's engineering labs and design studios buzzed with activity as students sketched, coded, and built prototypes. Mentors from various professional backgrounds were on hand to provide guidance, ensuring that participants could leverage their expertise to overcome any technical hurdles.

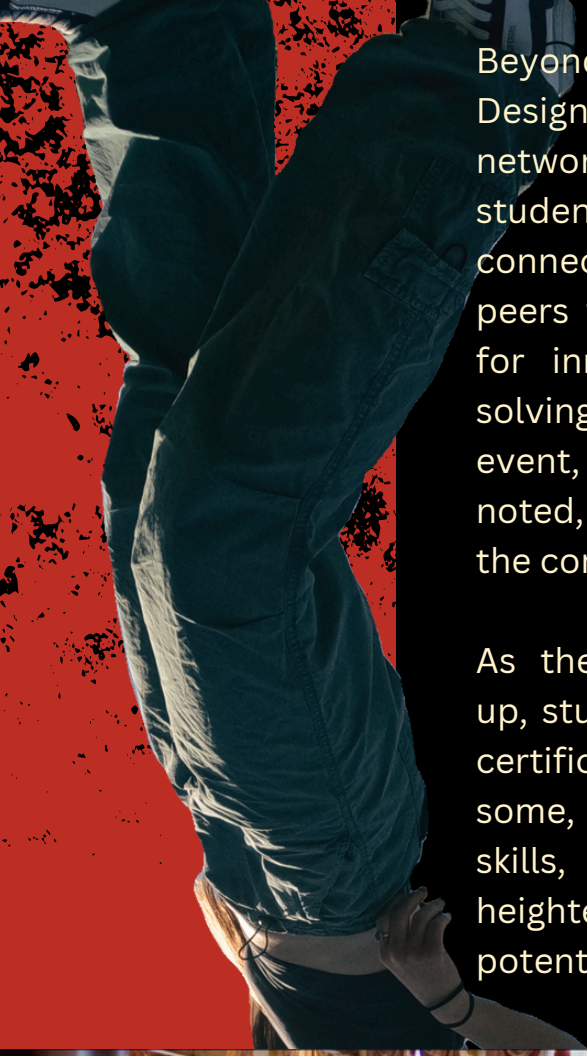
As the event concluded on Sunday, each team presented their solutions to a panel of judges composed of faculty members and industry experts.

The projects were evaluated based on creativity, feasibility, and potential impact, with the top teams receiving awards and recognition for their innovative approaches.

One standout project was a low-cost, portable water purification device designed for use in remote communities, demonstrating the practical and humanitarian potential of the participants' work. Another team developed an app to help mitigate food waste by connecting consumers with local businesses offering surplus food at reduced prices.

"IT'S A TESTAMENT TO WHAT CAN BE ACHIEVED WHEN YOUNG MINDS COME TOGETHER TO TACKLE PROBLEMS."

- Dr. Alex Chen



Beyond the competition, the Designathon served as a networking platform, offering students the opportunity to connect with professionals and peers who share their passion for innovation and problem-solving. This aspect of the event, many participants noted, was just as valuable as the competition itself.

As the Designathon wrapped up, students left with not only certificates and prizes for some, but also with enriched skills, new friendships, and a heightened sense of their potential to drive change.

McMaster University's commitment to fostering a culture of innovation and collaboration was once again affirmed, setting the stage for next year's Designathon to be even more ambitious.

For those who missed the live presentations, a showcase of the projects will be available on the McMaster Designathon website, inviting the wider community to explore the innovative solutions developed by the students.

ROBO MASTER

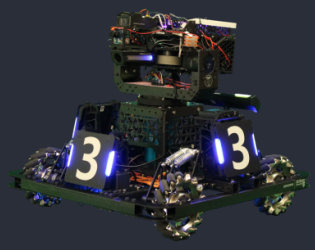
By Philo Girgis

Swerve Infantry

Launch 17mm projectiles, swerve drivetrain design to allow maximum mobility.

Sentry

Launch 17mm projectiles, fully autonomous robots powered by RL&ML algorithm to make decisions alone.



Mecanum Infantry

Launch 17mm projectiles, classic mecanum wheel and carbon fiber frame allow it be the most stable robot in the game.

If you've glanced through several clubs using websites consisting of outdated information, and blocks of text that just don't hone the benefits of joining, you might be in the right place. This club allows you to learn as the project grows, and it does not get enough hype. From the moment you join to getting into the routinely activities of a member, this article will tell you what a lot of these sites failed to mention. If you want to take part in the process of developing machines that will perhaps wreak havoc in a community full of robots, then this club is the right fit for you!

RoboMaster strives to accomplish this by prepping their robots for their annual competitions. This year, the RoboMaster University League will take place in Denver, Colorado and the RoboMaster University Competition in Shenzhen, China. In these events, groups are categorized in tiers and so alliances can be made.

The robots are prepared for challenges with unique purposes for each robot, such as infantry or "attack" robots, and a sentry robot which acts as a guard. With the requirements for robots to make decision, aim, and shoot, each function must be meticulously planned and coordinated between sub-divisions.

RoboMaster has room for a variety of different skills between their sub-divisions, focusing on computer vision, mechanical design, embedded systems, robotics, and include teams like electrical, business, computer vision, mechanical and control; all of which play a vital role in the production of each robot. Here, you can find summary of the computer vision, control, and mechanical division, which will give you a better idea of what you might be getting into.

DEPENDING ON YOUR STUDIES, INTERESTS, AND GENERAL EXPERIENCE, YOU MIGHT HAVE ALREADY BEEN EQUIPPED WITH THE SKILLS NECESSARY TO BE AN ASSET TO THE TEAM:

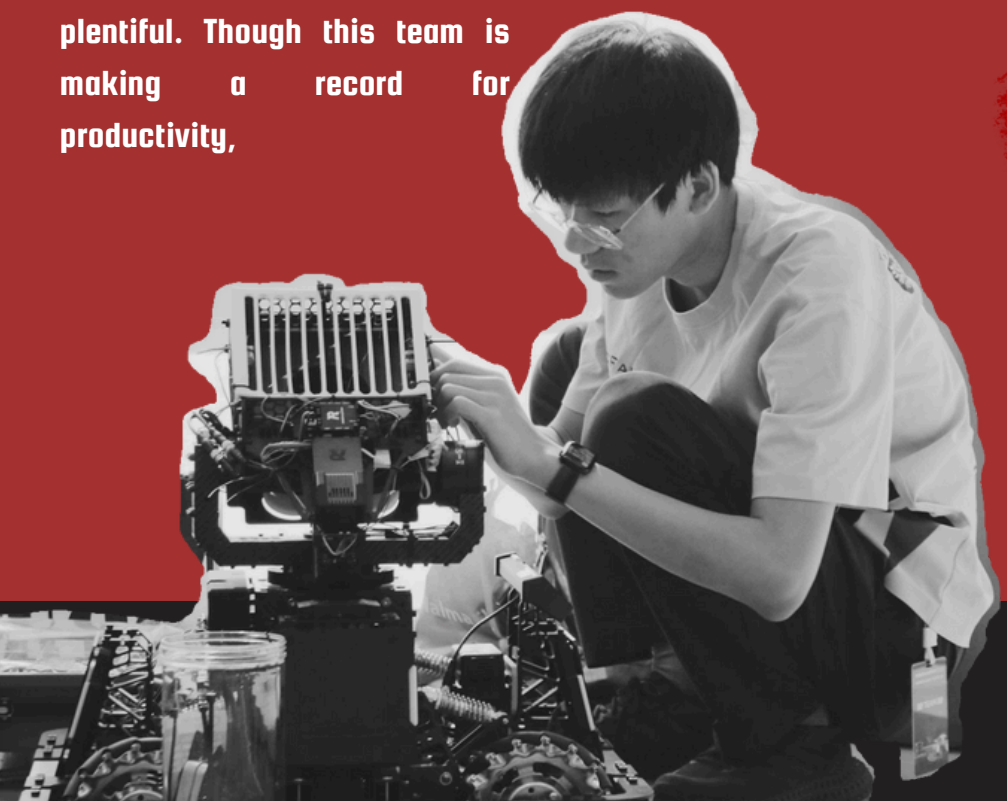
1. As a member of the Mechanical sub-team, you're entrusted to make the "Skeleton" of the robot, where parts of the robot are designed, 3D printed, and laser cut to give body to the build. In the process, you'll get to apply skills in CAD software, like AutoDesk Inventor, SolidWorks, and amongst many others.

2. The Computer Vision team forms the "Brain and Eyes" of the robot, where AI, special cameras, sensors, and algorithms are used to create a robot that can make sense of its surroundings. As a member of this team, you'll spend a good chunk of your time coding.

3 In the control team, you'll take part in designing the "muscles" of the product, allowing the robot to move using standardized control theory, as different drivetrains, connect controllers to development boards, deliver information to motors with communication protocols, and design robotic movements, (or flight systems if the robot is a drone). Your experience in this team will allow you to familiarize yourself with PID control, and appreciate to the wonders of motors, which you will troubleshoot, along with the wires, and mechanical systems of the robot.

While the importance of each sub-team can be explained, it will take your initiative to join and let this be an opportunity for you to grow and expand on your skills. The logistics of the team and each subdivision can be complicated, from basic tasks like material selection to problem-solving, the skills and potential experience you can gain from RoboMaster are plentiful. Though this team is making a record for productivity, the amount of responsibility you are expected to take on is contingent not only on the responsibilities of your execs, but on your commitment. If you are able to take initiative, and have the willingness apply yourself and to learn more about seemingly complicated concepts so that you can contribute to the team, you will be an asset to the team regardless of where you stand now in terms of skills and experience.

Whether you wish to compete in international competitions, to broaden your skill set, or even have the desire to see your hard work come to fruition, joining RoboMaster can help you to achieve your goals.



4U0 2 GO

By Huong Bui

CO-OP

START EARLY!

Hiring season starts around October/November and or January/February, this is when several positions are open for you to choose from. A lot of students also wait for this time of the year to start applying. This means that you are competing with a lot of students, not only from McMaster but from other universities in Canada—but, great news, a lot of big companies have positions available earlier in the year, like during August and September for the winter term, or November and December for the summer term. Some companies even start hiring a year before the start of the internship.

These positions might not be posted on OscarPlus, so it is always important to often browse through the companies' LinkedIn or career websites to check for available positions that might interest you. Besides these websites, it is also essential to get yourself involved in networking nights either organized by the faculty or by your program. There is a chance that there will be someone from the HR department coming, which is a good opportunity for you to not only learn more about the company that you are interested in but also to expand your network and create some sort of impression with them for your future applications.

Furthermore, you can also ask and learn more about the open positions that are not yet on OscarPlus or other platforms, which can help you to prepare in advance and apply as soon as the positions are open. It is crucial that you apply to any opportunities early, preferably 2 weeks before the application deadline. This is because many companies will start their interviews or online assessments just a week or two after the applications are open.

And for opportunities that are looking for only one or two students (which is the majority), the companies have likely finalized the candidates even before the deadline.

Besides looking at companies in the industry, you can also find co-op opportunities through your professors, or any professors at Mac that are looking for summer research assistants. Not every professor will have available positions, but there will be announcements sent out through OutLook regarding opportunities in early December or January. With that in mind, you can always start to reach out to professors, either in tutorials, office hours, or emails, earlier in the year, around October or November, to ask for more details about their research and if they are looking for research assistants. This can help you to network with the professors and demonstrate interest in their research. You can also talk to your TAs about their research experience, advice as fellow students, and tips on how to write a successful application. For people who are looking to pursue research as a career, this can be a hands-on experience for the future.

As for the application process itself, it is beneficial to reach out to your career advisors to get their help with perfecting your resume, cover letter, and interview skills. Do this earlier in the year so that you have more time to practice your interviewing skills, as school can become hectic as the year progresses. Again, networking is important. Compile a list of people involved with the companies you are interested in. LinkedIn can be a great way to identify these people.

Connect with people from your program (can be Mac alumni or alumni outside of Mac) to ask about how they got involved with the company, general application advice, or the positions you are interested in. Although not everyone will get back to you, those who do can provide helpful connections and insight into the role you want to apply for.

So, all in all, no matter what you do,

START EARLY!!

SHOES IN ENG

New Balance 550 “Sea Salt” Adelaide, MECH

New Balance 650 “White/Blue”, CIVIL

Onitsuka Tiger Mexico 66 “Yellow/Black”, Natalia, ELEC

Air Jordan 3 Retro “UNC”, Salini, ELEC

Air Jordan 1 Retro “Chicago” Raymond, COMP

Asics Gel-NYC “Grey/Off White”, Umar, COMP

Nike AF1 “White”, Audrey, ELEC

Air Jordan 3 Retro “Wizards”, Sarujan, COMP

Air Jordan 1 Retro “Bloodline”, I forgot to ask for steam lol

New Balance 530 “Sea Salt/ Timberwolf”, Arabella, ELEC

Nike Air Max 97 “Silver Bullet” Christy, ELEC

Recommen Techn

By Philo Girgis and Afsheen

Do you find yourself drowning in assignments, projects, and exams to study for, but for some reason also procrastinating and wasting your time away? If so, this article is probably what you need to get you out of your slump.

We've asked engineering students at McMaster how they manage to complete their tasks, specifically the study techniques they use to manage their workload. Listed below are some common study techniques that might be useful to you.

aded Study niques

You can start by using the Pareto Analysis to help you prioritize your weekly tasks. The idea is that 20% of actions you take lead to 80% of outcomes [1]. First, list all the tasks you need to complete for the week. Then, identify the tasks that are high priority, and rank all of your tasks from most to least difficult. The next step is to take action!

[1] S. Mozafaripour, "9 popular time management techniques and tools: USAHS," University of St. Augustine for Health Sciences, https://www.usa.edu/blog/time-management-techniques/ (accessed Mar. 25, 2024).

Now you may be thinking, 'How am I going to stay consistent and get all my tasks done?' Don't worry, we have put together study techniques that will help you stay consistent in your routine.

POMODORO TECHNIQUE

On a timer, set a focused time interval. You can set your timer for 30, 45, or 50-minute intervals of full study, with no breaks and no distractions. After your focused study interval, set 5, 10, or 15-minute breaks in between each interval. By doing this, you give yourself incentives for working for a long period of time. This study method is beneficial for those who do tedious tasks..

It's also beneficial for those who have large gaps of time in their schedules and individuals who find themselves confined to one location for extended periods of time.

BLURT TECHNIQUE

This method is good for studying a subject with a lot of memorization, often recommended for those who struggle to retain information or for those who have a lot to memorize under a time crunch. Unlike the Pomodoro Technique, this study method does not follow a structured schedule or routine.

ACTIVE RECALL

This study method is best for those who need to memorize and understand a lot of concepts in a short period of time. Instead of blatantly memorizing and repeating concepts over and over again, this technique involves stimulating your brain by scribbling with your dominant hand to retain and retrieve the information you have just learned.

FEYNMANN TECHNIQUE

This techique involves taking a complex concept and breaking it down into simple terms, so much so that even a child could understand it. This approach is great for students dealing with difficult concepts, as it forces them to thoroughly understand the material in order to explain it straightforwardly.

SPACED REPETITION

Spaced repetition can initially seem challenging as it involves consistently revisiting material over a set of days. Some students may find techniques requiring extended periods more difficult to adhere to. However, committing to studying a small amount of material each day in the week leading up to a test can ultimately relieve stress compared to cramming all the content just before test day. While this study method demands consistent effort, its long-term benefits in retaining and understanding information make it a worthwhile strategy for effective learning.

It may be difficult getting into a new routine but if you put your mind to it nothing should be able to stop you. If one study technique doesn't work for you, trying 2 study techniques at the same time!

NEWTON'S FIRST LAW IN ACTION

THE IMPACTS OF EXERCISE ON ACADEMIC PERFORMANCE

"AN OBJECT'S MOTION WILL REMAIN CONSTANT UNLESS A FORCE IS ACTING UPON IT"

By Mia Rodgers

As engineering students, we often have a heavy and challenging workload. For many, this can result in struggles with mental health, maintaining a healthy sleep schedule, and keeping up with coursework. While it is already an extremely popular rhetoric, sometimes we all need to be reminded of the serious benefits of physical activity on our body and brain. Many engineering students face the challenge of not having enough time to get to the gym every day, or go for runs/bike rides. However, even a small walk around campus, or a 15-minute at-home workout will still benefit your mental health and academic performance!

Regular physical activity has numerous positive impacts on one's overall health and mental well-being. Any exercise that increases your heart rate will in turn increase the flow of oxygen to your brain, contributing to improved working memory, processing speed, and cognitive capacity [1]! This means that you don't necessarily need to do strenuous workouts, simply elevating your heart rate is beneficial. Having some form of physical activity in your day also gives your brain a break from stressing about the labs, assignments, tests and exams you may have hanging over your head!

Mia, CIVIL

Moreover, physical activity stimulates your brain to produce endorphins [1], making you feel happier, less stressed and more confident to take on whatever school may throw at you! Additionally, as engineering students, it is common to struggle with keeping a healthy sleep schedule. It has been proven that daily exercise can enhance your quality of sleep and duration. Studies have shown that just 30 minutes of daily physical activity can result in an average of 15 minutes longer of sleep [2].

There are a multitude of ways to include more physical activity into your daily routine. This can include outdoor activities, at-home workouts, or utilizing McMaster facilities like The Pulse. Incorporating more active methods such as walking or biking into your McMaster commute is another great way to add more exercise to your day.

Activities like yoga or meditation can also reduce anxiety and help boost a positive mindset. Working out or playing sports with friends can also enhance mood through social interaction!

Setting small athletic achievement goals, such as daily step counts, can increase your confidence and contribute to a healthy work-life balance. Integrating light physical activity into your daily schedule will leave you feeling more positive and accomplished about your day, and give you the energy and drive to keep pushing throughout your studies!

[1] H. Godman, "Regular exercise changes the brain to improve memory, thinking skills," Harvard Health Publishing.
[2] M. A. Alnawwar et al., "The effect of physical activity on sleep quality and sleep disorder: A systematic review," Cureus.

ENGINEERING FACULTY

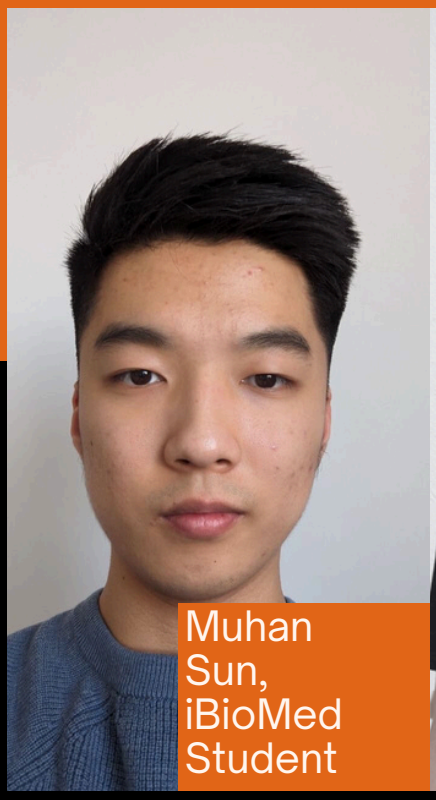
Written and designed by Keshavi M

STUDENT ACCOMPLISHMENTS

Made by: Aaron Zhao and Muhan Sun

"The reason why we developed Exo-tremor is because we want to have a low-cost solution to a very expensive problem".

"I wanted to create something that would make a lasting impact on people across the globe, no matter their socioeconomic circumstances."



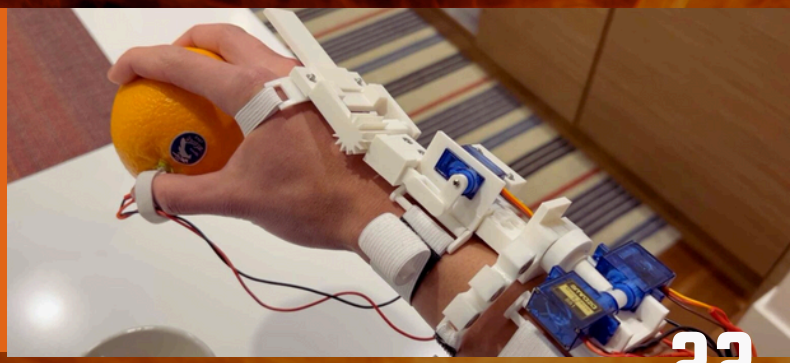
Muhan Sun, iBioMed Student

Aaron Zhao, iBioMed Student

The ExoTremor device helps those who have essential tremors or Parkinson's disease. When the user grasps an object, the prototype functions by impeding both the extension-flexion (up-down) and supination-pronation (left-right) wrist movements. The device can be used, for example, to hold a cup steady without spilling its contents by someone with hand tremors.

Zhao recently won the national Ingenious+ Challenge in the category of health and wellbeing. His personal experience served as inspiration for his creation, a 3D printed exoskeleton that helps persons who have trouble holding objects steadily by reducing hand tremors.

"All of my STEM-related passions matched with the Integrated Biomedical Engineering and Health Sciences Program," the student claims. Zhao could go deeper into his interests, which included making things, CADing prototypes, doing wet laboratories, and studying the anatomy and physiology of the human body.



ENGINEERING FACULTY

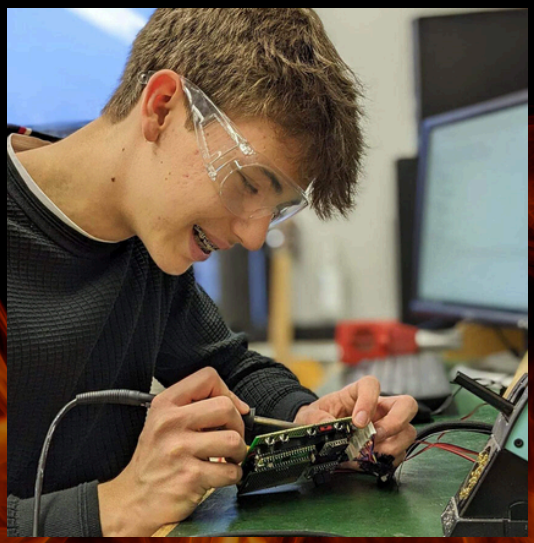
STUDENT ACCOMPLISHMENTS

Made by: Elijah Cosby

"It's not just about making new technology, it's also about designing technology so that it becomes an accessible and viable option for those who need it the most." - Elijah Cosby

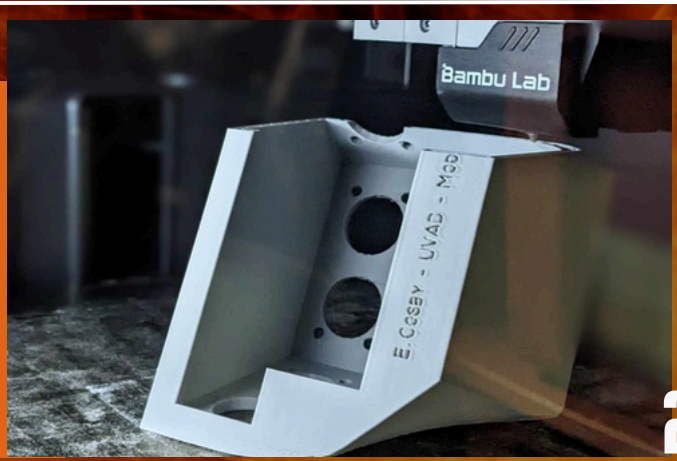
Elijah Cosby Ingenious Award Winner

Elijah Cosby, a 1st Year IbioMed student, designed a visual assistive device for people living with visual disabilities. His passion to envision and create a more safe and accessible environment for patients with visual disabilities is inspired by his best friend's grandfather who would often face challenges with his disability. Introducing Elijah's invention, the Ultrasonic Visual Assistance device (U-VAD). A device which helps people with visual impairments navigate the real world with confidence.



Elijah Cosby recently won the Ingenious Award in the Entrepreneurship and Technology category. Cosby continues to look at the funding of the future of U-VAD. Cosby has also become the youngest member of The Clinic, McMaster's Biomedical Health Incubator. Congratulations to Elijah Cosby for his hard work, and creative innovation!

U-VAD uses a method similar to echolocation to produce a frequency that is undetectable to the human ear and reflects off nearby objects. The gadget then computes the distances between the items, identifies the most relevant possible threat, and communicates this information to the user through a series of beeps. As the user nears an object, the beeping speed increases. In addition, the gadget communicates to the user directly, directing their attention to the locations of any impediments.



CONQUER YOUR ENEMIES
(procrastination)

OBTAIN WORLD DOMINATION
(Finish your schoolwork)

Keep it* in your pants!!

Are you sexually active or aspiring to be?

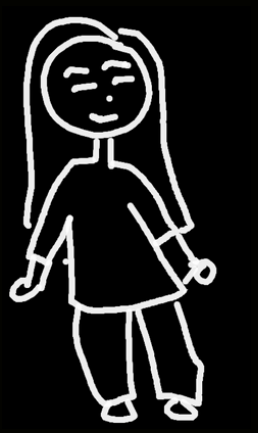
MacEng Society has partnered up with the MSU Student Health Centre and installed a new health initative with a FREE* condom dispenser on the first floor of Hatch (by the bathrooms).

Protect yourself and your partner by being prepared with one of these!

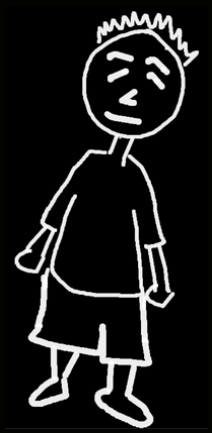
Be safe and remember if it's not an enthusiastic yes, it's a NO!

Always do your research and for any questions/concerns about the dispenser you can contact the Director of SHEC at shec@msu.mcmaster.ca or the MES VP Student Life at vp.studentlife@macengsociety.ca

This Edition would not have been Possible without our incredible Team:



Afsheen
Editor



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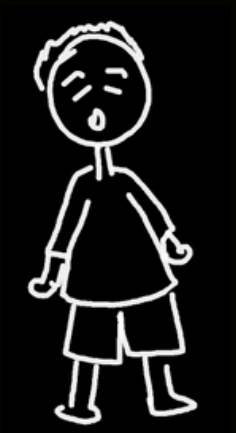

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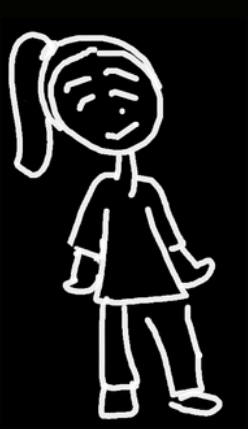

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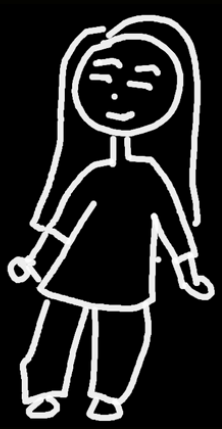
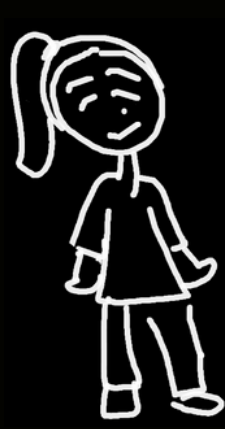


Keshavi
Writer



Simone
Graphic Designer/Photographer

Read the online edition of the Frequency at the MES website!

If you would like to submit an article for the Frequency or join our team, send us an email at frequency@macengsociety.ca