**Current Situation**

Are you a student taking classes? Do you work full-time? Please tell us where you are going to school or what you are working on right now.

I am a full time student in Grade 12 at Port Credit Secondary School in Mississauga. I will be Graduating in June of 2019.

**University Applications**

Please tell us which universities you have applied to and for which programs.

I have applied to Waterloo for Computer Science, Mechatronics and, Computing and Financial Management. I have applied to University of Toronto for Computer Science and Engineering Science. I have applied to University of Guelph and received an acceptance for Computer Science. I have applied and got an acceptance form Carleton Computer Science Honors. I applied to McMaster Computer Science. I have also applied and received an acceptance from Ryerson University, Computer Science.

**Initiative**

What matters to you? When have you shown great initiative? Why were your actions needed? How did it impact the people around you? Describe a time when you have shown great initiative. How do you think this will apply to your computer science degree?

In my grade 11 year of my robotics team we did not make it to the Vex world championships after a great deal of thought I decided to start my own private robotics team. This decision was due to a number of factors however the most pressing one was that we felt that the school was too restrictive, we could only work at certain times and there was a lot of bureaucracy and issues with going to competitions. I got a collection of 12 of the hardest working members from that club and we decided to start our own team together. There were a lot of challenges with creating this team primarily finances. We needed to raise as much money as possible as we no longer had all the resources from the school such as parts and tools. To raise money we made all members pay an initial fee however we also went out and got the majority of our budget from sponsorships. Initially we raised a small amount of money by going to local businesses in our area and asking small businesses for sponsorships up to $500. Eventually we rose up and got meetings with companies on Bay street including IBM, Dell, Deloitte and CIBC. We raised over $10,000 for our club to purchase parts as well as pay the fees to compete in competitions. Once the finances were dealt with building began, we built starting in May, my team built through July while I was away and we have been building 3-5 times a week in my basement. I play a large role on the team as the head programmer, a builder as well as the driver, this combination of skills allows me to have a large advantage over other teams as I can work with all three portions of the robot and get them to work together rather then having a disjointed system. In a recent competition we went to on February the 9th we won every single match we played including every single autonomous portion of each match, clinching the Tournament Champions trophy. Prior to that competition we have competed in 3 competitions, qualifying for the provincials tournament in our first tournament, making it to the semi finals in each tournament and winning 2 design awards. We hope to reach the Vex World Championships this year in Kentucky by qualifying in our provincial championship competition on February the 23rd. As a whole my initiative led to our team performing to a dramatically higher level and we are all a lot happier now then having to deal with issues with our school team. I am sure if I had not taken the initiative to start this new private team that we would not have performed so well and if there is one thing I could take away from this experience it would be how important it is to take initiative, if I had not done it then no one else would have. I feel my initiative will translate directly into my computer science degree, just like I was able to identify the problem with my robotics team I am able to identify problems in systems and rather then putting issues aside I tackle them head on and deal with the problem immediately.

**Commitment**

Tell us about your persistence. When has your commitment paid off? And what did you get out of it? Describe your commitment. How do you think this will apply to your computer science degree?

In Grade 10 I joined my school’s Vex robotics team 4659 Warriors. In this club there were 5 teams split into each grade with two grade 9 teams. Every week from the beginning of September until February we would spend 3 days a week for 3 hours at a time working to make a robot for competitions. I put my heart and soul into my work, coming up with new designs and programming in my spare time so as to get every little competitive edge. My grade 10 team did not make it to the provincial championships in our year however the grade 12 team of that year progressed through the provincial championships and qualified for the world championships. I was invited to join the Grade 12 team when they went to the world championships in Kentucky for my unique ability to combine mechanical skill and programming skill as well as for my proven dedication to the club. The world championships were a fantastic experience competing with teams from all over the world, from Ethiopia to China to Mexico. After the world championships the former alumni chose me to become the president of the club despite me only having one year of experience on the team. When I had first joined the team I had no idea how to program or build a robot and I had no idea in one year I would be walking into the Vex World championships, all I knew was I had a passion to program and a drive to make the best product I could. This translates directly into a computer science degree, even if I have no idea how to solve a problem I will work hard and put in the hours to solve that problem.

**Teamwork**

Tell us about your collaboration skills. When have you worked with a team? What challenges did you face? What were you able to achieve while working with a team? Describe any teamwork experience you have had and how you think it will be relevant to your computer science degree.

In May of 2018 I competed in an event known as PCHack day a hackathon hosted at Applewood school, it was a full day event in which each team was given a list of categories and we were challenged to develop some sort of technology or device to solve an issue in that field. On my team were 3 other students at Port Credit who all excelled in different fields, from business to marketing to brainstorming. My job was to develop the technology while it was their job to create the presentation for the judges and develop a perfect pitch. We decided for our application to develop a system to access the internet without using data rather using sms/texting. This had numerous application from those who are lost and need directions or those in third world countries who may lack the necessary infrastructure for data. I spent the 8 hours of the day developing the system, attempting to lower latency times and develop more applications for it and eventually we got a highly functional prototype, at the end of the day we presented the application to the judges. We won second place in the hackathon of a total 75 other people. After the hackathon we were approached by some of the judges who were impressed with our technology and they asked us to join their team to plan a hackathon for next year. We could not have achieved this without strong teamwork and collaboration skills. As this team we were all able to work together and cross into each other’s fields without interfering, we were able to work together on tasks while still maintaining our concrete roles. I feel as a computer science student this is important, it is important to understand a system as a whole rather than viewing a system as its component parts, when you work as a team you are given a task but you also must understand the tasks of others and how they all fit into a final product.

**Volunteering, Extracurriculars, Work Experience**

Tell us about what keeps you busy. What are you involved in? What communities are you a part of? Describe your involvement and how you think it will help you with your computer science degree.

Though I am a hard working student I also spend a lot of time volunteering, working and participating in extracurricular activities.

My largest project as of right now is that me and a team of high school students are planning to run a hackathon at the University of Toronto Mississauga. After a hackathon I went to with my team, we were recruited to join the pchackers club to develop an even bigger and better hackathon for the next year. In May of 2019 we partnered with MLH(Major League Hacking) and we hope to host Canada’s largest high school run hackathon with over 200 competitors. Over the summer and throughout the first semester of Grade 12 my team and I have been going around doing tours of different facilities from Sheridan college to BMO headquarters. We have now decided to host the hackathon at the University of Toronto Mississauga campus, with the date and location booked the rest of the year will be spent fundraising and advertising.

I am on my school’s reach for the top team. Reach for the top is a competitive trivia game where representatives from each school go to compete in competitions first across the region then to the province and finally to the national championship.

I am also a part of the Mock Trial team at my school which competes in OJEN(Ontario Justice Education Network) tournaments. We will be working with a lawyer to develop a full case including opening/closing statements and questioning of witnesses. We will then compete at courthouses and schools in tournament style events.

I volunteer at a day camp run by the local community organization. The camp is for kids ages 6 to 12. I always volunteer to run activities for the youngest kids. As a counselor it is my duty, to keep the kids entertained. Throughout our youth we take what we are given for granted such as summer programs, school extracurriculars and sports teams but eventually there becomes a time to give back and that is what I feel is the most important part about volunteering at this camp, the experience of giving back to the community.

Finally I also have work experience. I worked as an umpire over the summer where I umpired Rookie Ball and T-ball games. This taught me a lot about working with other people and managing in high stress situations. Not often but sometimes what would happen in games is a coach would be upset with a call or a play and they would come to us as the umpires to deal with the situation. In some cases there were coaches who would yell and argue and it was our job as the umpires to diffuse the situation and figure out the best option in this high intensity situation. I also worked at a company called Liberty Metric inc for data entry. This job was fairly mundane and I worked from home however it provided me with the experience of dealing with tasks in a more professional environment.

**Technology**

Tell us why you are choosing a degree in computer science. Why are you interested in technology?

Ever since I was a young child I have always been interested in cutting edge technology and its applications in our everyday lives. Being born in 2001 I have seen the computer go from the workstations running Windows XP through the release of the first iPhone to the point we are at now where we have computers on our wrists and can access the internet from anywhere in the world. We are in a unique era where technological advances are happening everyday and with the ubiquity of the modern internet everybody has been given the ability to contribute and engage in this technological progress. I am pursuing a computer science degree as we are in a world that is constantly changing and it is the computer scientists who are the pioneers of this new world. A computer science degree in this new world provides so many different opportunities to work on with projects of all different scopes and scales. Computer scientists are the backbone of our society, maintaining the luxuries of nearly every aspect of our lives, from the cars we drive to the media we consume. Without computer scientists there would be no Automatic Braking systems in cars, no modern airbags or traction control in cars. Without computer scientists there would be no Netflix, no longer would we be able to access news at such a rapid pace. We take for granted all the luxuries in our modern day life that come from computer systems that have been programmed and built by computer scientists. Recently after being inspired by the self driving car projects from companies such as Uber and Google I decided to see if I could attempt something similar. Using OpenCV and Python I decided to challenge myself and see if I could make a self driving car program which would analyze the roads and identify objects as well as lanes without using the modern sensors that come with self driving cars such as LIDAR and ultrasonics. Through many attempts and many hours spent trying different methods I was able to develop a prototype, which had impressive results given the complexity of the problem. This project taught me a lot of technical skills but what it taught me above all was that you can do anything and especially with the modern internet, us computer scientists are now unshackled by lack of resources.

Link to Github: https://github.com/123p10/OpenCVSelfDrivingCar

**Question 1**

A company selling hand-crafted protractors is running a contest to extend their brand awareness. They need to ask a skill testing question of their customers who participate. They ask the following question: What is the angle between the hands of a clock at 4:30pm?

Minute hand at 30 minutes: 360/12 \* 6 = 180 degrees

Hour hand, half in between 4 and 5, 360/12 \* 4.5 = 135 degrees

Angle between the two hands = 180 degrees - 135 degrees = 45 degrees

**Question 2**

A picture printing company sells photos, mugs and posters with their customers pictures on them. Photos ship in envelopes, which cost $2. Posters ship in tubes. A tube plus 2 envelopes costs $12. Mugs ship in boxes. A ½ box is equivalent to a tube. What is the value of two boxes and a tube, divided by a tube and an envelope?

**Given**

Envelopes = $2

Tube + 2 Envelopes = $12

½ Box = 1 Tube

**Solution**

1 Tube = $12 - 2 Envelopes

1 Tube = $12 - 2\*($2)

1 Tube = $8

½ Box = 1 Tube

1 Box = 2 Tubes

1 Box = 2\*$8

1 Box = $16

(2 \* ($16) + $8) / ($8 + $2)

$40 / $10 = $4

**Question 3**

Draw a 10 x 10 grid. From the top left, label the horizontal squares A through J. These are your X coordinates. Label the vertical squares 1 through 10. These are your Y coordinates.

You can locate a square using it’s XY coordinates. The top left square is A1. Up is North.

Start in square E5 facing East. Move 2 squares forward

Turn 90 degrees clockwise, move 3 squares forward

Turn 180 degrees anticlockwise. Move 5 squares forward

Turn 90 degrees anticlockwise. Move 4 squares forwards.

Turn 90 degrees clockwise. Move 2 squares backwards.

What is the XY coordinate of the square you are now in?

**Question 4**

Using an alphabetical cipher, if SKU = TLW, SHIP = TIKS, SHOPS = TIQSX, and STORES = TUQUJA what is the value of UNICORN?

ABCDEFGHIJKLMNOPQRSTUVWXYZ turns into numbers so

1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26

Therefore

SKU = TLW

Is

19,11,21 = 20,12,23

STORES = TUQUJA

19,20,15,18,5,19 = 20,21,17,21,10,1

The differences between each character can be repesresented as well

SKU = TLW

1,1,2

STORES = TUQUJA

1,1,2,3,5,8

This is Fibonacci

So UNICORN = 21,14,9,3,15,18,14

Then 21+1,14+1,9+2,3+3,15+5,18+8,14+13

22,15,11,6,20,26,27. We modulus all these numbers by 26 to get the character code in case we have a character code above 26

VOKFTZA

**Other Community Programs**

Are there any other community programs you have participated in that have supported your interest in math or computer science?

SHAD Valley, Vex Robotics, PCHacks Hackathon.