

Wayzata High School
Class of 2017
Plymouth, MN

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ACADEMIC PROFILE

Wayzata High School: Weighted cumulative GPA: 12.982 equivalent of a 4.327
 Unweighted cumulative GPA: 11.911 equivalents of a 3.970

AP: Computer Science, Physics 1&2, Chemistry, Calculus AB/BC, European History, US History, English Language, and Literature

Test Scores: ACT Composite: 33
 SAT Math 2 Subject Test: 800
 SAT Physics Subject Test: 720

AP Scholar with Distinction (2015, 2016)
 Awarded to those with an average of 3.5 on all AP exams, and with at least 5 exams with a score of 3 or higher. I have not received less than a 3 on any of the AP exams I have taken and my commitment to learning more about Science, Technology, Engineering and Math is shown by the rigorous course I have taken.

Middle School Recognition
 Wayzata East Middle School "Top Five" Award, in Language arts Communications, Science, Health, and Math. Awarded to the top 5 students throughout the entire grade, in each subject.
 Northwestern University's Midwest Academic Talent Search Recognition Award. Awarded to the most able 3rd through 9th grade students by attaining outstanding academic achievement in math and/or verbal areas.

ADVANCED STEM RELATED COURSEWORK

Intro to Computer Technology:
 Learned about the different hardware in a computer as well as different software that run on the computer. I became well versed in Microsoft Office and could use Word, PowerPoint, and Excel in advanced applications. Also, I learned how to use HTML and CSS programming languages for web development.

Honors Mentor Connection:
 Rigorous mentorship program for talented students to research and work in their field of interest. This program has allowed me to explore future career paths within computer science as well as taught me professional skills and etiquette.

Intro to Programming:
 Learned the fundamentals for programming. I became fluent with Visual Basic Programming and various foundational computer science concepts.

AP Computer Science:
 Learned more about computer programming concepts and delved deeper into the world of computer science. Through this class I became well versed with the Java Programming language and learned many techniques for solving problems by developing algorithms.

Introduction to Computing and Programming Concepts (CSCI 1133 at the University of Minnesota):
 Learned more advance programming using Python programming language. Through Post-Secondary Enrollment Option (PSEO), during 11th grade I took this course to further expand and explore computer science. I am grateful that I had the experience of going to college lectures and labs and taking college exams.

Introduction to C/C++ Programming for Scientists and Engineers (CSCI 1113 at the University of Minnesota):
 Learned the intricacies of and became fluent in C/C++ programming. During 12th grade, I continued PSEO and took this course outside of a full secondary school schedule.

Computer Networking Essentials:
 Learned how computer networks function and more specifically about routing and switching. This class was taken outside of my full schedule at the high school during 11th grade and introduced me to the computer science area of Networking. It was a preparation class for a CCNA Cisco Routing and Switching associate networking certification, and it covered the OSI networking model quite in depth.

AP Calculus AB/BC (equivalent of Calculus 1 and 2):
 Learned the fundamentals of calculus and some more advanced applications. After testing out of 10th grade level math during 8th grade, then doubling up with 11th/12th grade level math in 9th grade, I got ahead and took more advanced level math courses. In Calculus AB, I learned about differentiation and different techniques for using it, like related rates and physical applications in kinematics. In Calculus BC, I learned more about integration and special techniques used for it, as well as more advanced applications such as Taylor Series and 3D volume determination.

Linear Algebra and Differential Equations:
 Learned further techniques and applications for solving linear differential equations. Through this course, I have become much better at using calculus as well as matrices to solve various types of problems. In addition, this course taught me how to use the MATLAB programming language.

AP Physics:
 Understood advanced physics applications and how to solve them. After testing into Honors Physical Science during 9th grade, testing out advanced Biology before 10th grade and finishing advanced Chemistry by 10th grade, I took the AP science courses. AP Physics covered a broad range of topics from kinematics to energy transfer in systems to mechanics, thermodynamics, electricity and magnetism. In addition, after the course I self-studied modern physics and some optics to take the Physics 2 AP Test in addition to the Physics 1 AP test.

AP Chemistry:

Studied advanced chemical systems. This course taught me to understand the world at an atomic level by examine the properties of elements and how they affect chemical reactions, energy transfer, thermodynamics, etc.

EXTRA-CURRICULAR ACTIVITIES AND LEADERSHIP

Policy Debate (2013-Present)—Captain

Centered on an annual resolution pertaining to implementation of policies, based on the costs and benefits of proposals.

Summary: Many of the resolutions dealt with Science and Technology related topics such as the development of the earth's oceans and NSA domestic surveillance. Learning how public policy interplays with the development of science and technology was important to my understanding of how technological advancement impacts society.

Awards: 4th Speaker Concordia (Nov 2016), 1st place Unbrooks Novice Division (Nov 2014), 4th Speaker JV State (Dec 2013), 3rd Speaker Roseville invitational (Oct 2013)

Business Professionals of America (2013-Present)—Officer

A club that competes in business/technology events. I have competed in VisualBasic.NET, Java programming, Website Design, Spreadsheet Applications, Economic Research, Computer Network Technology.

Summary: Much of my interest in technology has developed through the events I competed in during Business Professionals of America (BPA). Much of the knowledge I have about computer science was learned from BPA.

Awards: 1st Place in Visual Basic Programming (Mar 2015, 2016), 3rd Place Computer Network Technology in (Mar 2016). Wayzata Varsity Activities Award (May 2014, 2015): Awarded a Varsity Letter in BPA by qualifying for nationals.

Chess Club (2010-Present)

Learning strategies and competing at state-wide chess tournaments.

Summary: Although chess does not have a direct relation to STEM, the logical thinking and strategy involved when playing chess was very enjoyable to me. In addition, this kind of thinking applies directly to Computer Science as most programs that are made are logical solutions to a puzzling problem.

Awards: 1st place MN Scholastic Chess Team Championship (2015)

North Suburban Summer Academy for High Potential Students

Attended summer classes on various science and technology related areas.

Summary: In elementary school I took "Physics, Physics, Physics," and "Creative Computers." In retrospect, my experience at summer academy helped initiate my interest in STEM and introduced me to the logical thinking and curiosity that scientists have.

COMMUNITY AND VOLUNTARY SERVICES

Volunteer Presidential Service Award, Gold (May 2014-2016)

Award for 250+ hours per year of community service. These awards demonstrate the importance I give to service activities and giving back to the community.

Teaching Assistant, North Suburban Summer Academy (Jun 2013, 2014)

Help teach gifted students in classes: "Incredible Machines and Gizmos," and "Inventions and Engineering." After attending Summer Academy during elementary school, in middle school and high school I decided that I wanted to return to teach young motivated students. As a teacher's assistant at summer academy, I was often faced with relentless questioning from the children and their constant fascination of the world eventually became second nature to me as I also learned how to question the world around us and develop new methods to answer my question.

Library Computer Tutor (2014-Present)

Assisting patrons at the library who are using the computers. Many people around my community, like senior citizens, or immigrants or adults that didn't grow up in our technological generation don't know how to use the computer. As society is now so dependent on being able to use a computer, I decided that I should use my knowledge and skills with computers to help those who need it.

Policy Debate Novice Coach and Judge (2015-Present)

Judge novice debates at various tournaments; help teach different debate skills to novices. Judging debates allowed me to view public policy in a different lens. I had to evaluate what was the best policy option given various pros and cons from each side and decide whether to implement the policy or not.

Minnesota Microscopy Society events (2010-2014)

Set up microscope demonstrations and teach students at events at 3M, Science Fest, and the University of Minnesota.

Volunteering with the microscopy society of Minnesota allowed me to introduce many kids to the field of science and microbiology. In addition, I got to experience the intersection of technology and microbiology by using and setting up microscopes and additional high powered microscopy equipment.

PROFESSIONAL EXPERIENCE

Program Assistant at North Suburban Summer Academy (Jun 2015, 2016)

As a staff member, helped administer the academy from setting up classrooms to aiding teachers and students. After being a student and a teacher's assistant, my interest in spreading STEM education continued through Summer Academy as I became a Program Assistant. The experience was similar to being a teacher's assistant but was a level higher, as I had many more administrative responsibilities and expectations.

Teacher under Center for Academic Excellence (Nov 2016-present)

Taught Speech/Debate and Computer Science classes to elementary and middle school kids. Getting the chance to interact with and teach young kids who were so interested in learning more about STEM was a great experience. Many of these young kids had not been exposed to computer science or professional debate so I was glad I am able to use my knowledge to show them the intricacies of STEM.

RESEARCH AT GRAPHICS AND VISUALIZATION LAB

Research Project on how Haptics Effects Agency and Ownership:

My project had 10 human participants come in and wear the Oculus Rift and attached Leap Motion Sensor. Each participant created 3 tasks and then filled out a questionnaire. The results from the questionnaire were used to determine how Haptics changed the Agency and Ownership a person feels over their hands in a virtual environment.

Learning the Technology:

Initially at the lab I had to familiarize myself with the technology. I learned how to use the Oculus Rift Head Mount Display and peripheral devices, the Oculus Standard Development Kit, the leap Motion Sensor, and the Vicon System. In addition, I learned how to use new software like UnrealEngine4 and Autocad.

Designing an Experiment:

In order to come up with a good experimental design I read a lot of other research papers dealing with Virtual Reality. I became skilled at researching a specific topic using Google Scholar, and also learned a lot about how virtual reality experiments are carried out. Sometimes subjective questionnaires are given to measure certain qualities a person feels in a virtual environment, in other experiments a 2 Alternative Forced Choice method is used to analyze how a user acts in virtual environments. I decided to use a questionnaire and then determined how the experiment was going to be carried out.

Setting up the Materials:

In order to conduct an experiment, a virtual environment was needed, so I created a simple virtual environment using unreal engine. Then, in order to allow for hand tracking capabilities, I had to attached the Leap Motion Sensor to the Oculus Rift so I designed an attachment for that purpose. I tested the experiment out numerous times before conducting it with human test subjects.

Conducting the experiment:

While conducting my experiment, I learned how to use human test subjects to test virtual reality. There are a lot of details that go into using test subjects, such as what information I need to collect about them, how much should be explained to them, and how to incentivize and bring people in to test the experiment. In addition, a lot of details need to be figured out regarding when and where the experiment is going to be conducted and I ended up creating a time schedule sheet for all my subjects so they know when to come and what to do. This process of learning how to manage an experiment was helpful.

Collecting the Data:

My experiment measured subjective human conditions (agency and ownership) so I had to learn how to do this using survey questions. This process was extensive as a lot of thought must go into how the questions are worded in order to collect and unbiased and accurate results. The process of collecting data showed me how psychology actually played a role into how I conducted my experiments. I ended up deciding to have each subject rate statements dealing with agency and ownership on a 7 point Likert scale.

Analyzing the Data:

After I had about after I had about 130 different numbers I had to figure out how to analyze these numbers and draw conclusions and results for my experiment. Using some assistance from professional statistician I knew, we were able to create distribution charts and conduct T-tests across each test to analyze the significance of the results.

Creating a Poster:

Creating a neat visual display for my project involved a lot of thought. The data needed to be represented in a way that was understandable and the poster needed to be designed and followed in a format that was logical. Besides for figuring out these nuances, I learned how to create a 36"x48" poster on PowerPoint, as well as get the poster printed.

Presenting my work:

At Twin Cities Regional Science Fair, I presented my work to judges who are professionals in STEM fields. This experience taught me how to summarize my entire project in a few minutes and answer questions about it on the spot in front of other professionals.