

Personal Statement

I am a freshman at Brown University studying computer science. At the end of the year, I will have completed a full year of university-level computer science coursework in Java and Python. In future years, I plan to explore and potentially focus on artificial intelligence, machine/deep learning, and graphical modeling. I am excited for the opportunity to engage in research in this field over the summer and participate in the Weizmann ISSI program because I want to develop my skills and immerse myself in the challenges of computer science research.

I have always been curious with a desire to learn, and I have always loved to make things. Whether it is writing a computer program or building a physical object, I am excited to develop a plan, execute it, and see the results of my efforts. My senior year of high school, I had the opportunity to pursue an independent project of my choice for six weeks. I worked in the school's fabrication lab, pursuing a passion of mine and learning how to use all of the tools and machines. I love actualizing passions and being able to create objects, in this case physical, that stand as testaments to my hard work and growth. I completed two capstone projects. The first was to build and stain a wavy checkered cutting board that incorporated two types of wood, intersecting while fitting together precisely. The second project was to build a mini electric guitar. Along the way, I hit many roadblocks, and I had to update my designs. However, through the struggle came a comfort with project planning, design, and fabrication techniques that I can now use to bring things I love into the world.

To me, the purpose of building is not just to create something I can be proud of, but also to serve a greater need. After arriving at Brown, I found an opportunity to use my skills to serve my community by recruiting a group of people to build a large wooden sukkah on the patio above one of the dining halls. I had never built anything at this scale before, so it was a learning process. I consulted mentors and made use of the resources available to me. First, I met with my engineering teacher to discuss the design and work out all of the kinks prior to getting the wood, and I borrowed tools from him and the fabrication lab on campus. It was a lot of fun to go back and forth on designs, going through hypotheticals, and thinking about the different physics-related mechanical issues I would have to address. One challenge was that many of the people I had recruited for the project did not have any woodworking experience. I taught them some basic tool skills so that they were able to contribute. Once built, my community and I were able to make real use of the sukkah, bringing our food there to eat, sleeping there on one of the

nights. The most joyful occurrence was bringing food there and seeing others whom I did not know making use of the space that we had made. I continue to work on projects to bring people together, and I love being able to make a difference in my local community.

Time and time again, I find myself learning the value of dedication. First semester, I took the required introductory course in computer science. Because of my coursework in high school, much was review, and I could have coasted through the class to an easy A grade, not getting much out of the semester. Instead, I put in the time and effort to get more out of the course and learn the material more deeply. I added extra functionality to each project and ended the semester in the top 5% of the 420 person lecture. Similarly, for my pass/fail engineering and calculus classes, even though I only needed a 65% to pass, I put in the extra work to master the content and ended the semester with A-equivalent averages in both.

For my final project in my computer science course, I programmed a game of Othello, complete with graphics, as well as player vs. player and player vs. computer functionality. It was, at times, very frustrating, but very rewarding as well. I loved seeing how all of the components fell into place, and then at the end, getting to run my different computer players against each other. While the primary computer algorithm we were to implement was mini-max at varying depths for varying intelligences, I had a lot of fun adding elements of randomization and extra algorithms for new computer player options. As the finals period went on, it was difficult to pull myself away from adding more and more functionality to my Othello in order to actually get my other work done!

One of the most important aspects of my university experience is exploring different academic pathways. Once I finish the introductory course sequence for computer science, next year I will be able to take advanced courses in topics such as systems management, graphics, and deep learning. At the moment, I do not know the exact subfield I plan to pursue, but I am very excited about all of the different interesting routes my career may take. In addition to coursework, opportunities outside of the classroom such as the research work at the Weizmann Institute will be an invaluable experience in helping guide my career path. I have always enjoyed research, but I have yet to do any serious computer science research. I plan to explore it in a committed way, as I think it is very important for my career, as, alongside industry, I am considering going into research long-term. One component of computer science that has always fascinated me is the unique approach to problem solving and the ways that it can be applied to

many issues in our society. I am driven to pursue this professional exploration because of both how much I enjoy computer science and how much of an impact it can have. My current project in my data structures and algorithms course is to create a decision tree generator, implementing a machine learning algorithm that takes in a data set and builds out a structure to help predict outcomes of new data entries outside of the training data. This sort of probabilistic analysis and prediction can be used for many different applications that deal with large amounts of data, from economics to healthcare. We also discussed the dangers of algorithmic bias from the training data, and I am interested in developing ways to prevent these pitfalls to promote accuracy and effectiveness.

I am very excited about the ISSI program- it stands out to me as quite a unique opportunity! To engage in research alongside similarly passionate peers at an institution the caliber of Weizmann would be amazing. Coming in with a computer science background to a program predominantly with projects in the physical sciences would place me in a community where I might be taking my knowledge and applying it to other fields, giving me a taste of the role that computer science can play in the greater scientific community. Whether my primary research focus is in computer science or applying it elsewhere, I will be in a community setting where I will get the perspectives of other scientists from broad backgrounds, and I look forward to the opportunity to learn from them and grow. At Weizmann, I look forward to attending lectures and meeting with senior researchers, an incredible experience to be offered to me at such an early stage in my academic career. I will be able to truly immerse myself into the world of research while learning from leading individuals in my fields of interest. I also look forward to the week-long program with the Society for the Protection of Nature in Israel—I love hiking and exploring nature, and with the guidance of SPNI, I will be able to gain a new appreciation for the wildlife and ecology of the surrounding environment in Israel. In the event that I am not selected to participate in this program, I still plan on pursuing computer science research in a serious way. I am applying to a few research programs in the US and one other in Israel. This summer, I look forward to immersing myself in computer science research, in an in-depth way outside of my normal academic routine.