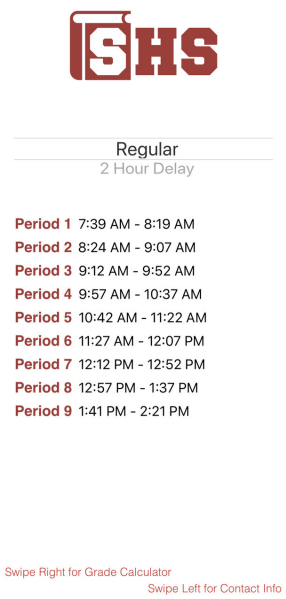
Park, Daniel

91803957150



MIT Admissions

Maker Portfolio 2019-2020

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Submitted: November 1, 2019

Paid: $10.00 on November 1, 2019

Forms

Biographical information

* indicates a required field

1. Date of Birth

07/03/2002

2. Are you submitting a freshman or a transfer application?

Freshman

2.1. Are you applying for Early Action or Regular Action?

Remember that all supplements must be submitted by November 1 to be considered for Early Action or January 1 for Regular Action. Supplements submitted after these dates will not be evaluated.

Early Action

2.2. Application ID

Your seven-digit application ID can be found in the top banner of your MyMIT account.

2343111

Maker Portfolio

* indicates a required field

The Maker Portfolio is an opportunity for students to showcase their technical creativity. Members of the MIT EAB — an advisory board of faculty, instructional staff, and recent alumni with notable experience and expertise in making across several domains — review all Maker Portfolios, and evaluate them on the basis of creative ingenuity, technical skill, and potential impact on the maker community at MIT.

1. What kinds of things do you make?

Maker Portfolios are reviewed by the EAB, composed of MIT community volunteers with technical expertise in different modes of making. We use the answer to this question to help route your portfolio to the people best equipped to assess it. Please select, from the alphabetical list below, the primary material or modality in which you make stuff. You may make different things, and/or your projects may involve several kinds of materials; if so, just try to pick the category where another person who works in that category would most 'get' what you do. Many members of our EAB have broad experience with making, and we will reassign you to a different evaluator if necessary.

Code

2. What do you make?

Describe for us the kind(s) of thing(s) you make. This should be a general overview of your project(s); you will be able to submit pictures and video with specific descriptions later. Often, the most helpful explanations for Maker Portfolios emerge in the captions to the portfolios, where they can form a kind of narrative to help us understand how a project or projects unfolded.

When I was in the eighth grade, my technology teacher, Mr. Perry, had us do an "Hour of Code" session with block coding. There were about eighteen stages, and we had to guide your character Steve through a maze-like puzzle.

Even though my peers were generally uninterested in the activity, I immediately became hooked. So hooked that after the class was over, I asked Mr. Perry what the assignment was and if we could do more in class.

He explained to me that it was coding, and if I was interested, I should pursue it in high school.

Ever since then, I continued to drive my passion by teaching myself how to code. I worked on developing numerous apps, websites, and games whenever I had free time. I dedicated myself to learning to the point where I was appointed my school's app developer.

I am excited to show you a small portion of what I have programmed so far!

3. How do you make?

Describe your making process. What tools, techniques, or programs do you use? Which guides, tutorials, or support communities help you? Where do you make things (at home, at school, in a community space, on your computer, etc)?

A program starts with an idea. Whether it is a game, app, or website, I like to draw my plans, pouring out all my thoughts into a notebook before I start developing anything.

Next, I choose what program I am going to develop the software. If I want to code a game, I use Unity. If I am developing an app, I use PhoneGap. If it is a website, I use NotePad++.

Then I start developing.

Although I usually like organizing my time when it comes to school assignments, my work ethic is completely different when I code. Sitting in front of my computer for hours, I often work hours on end, losing track of time because I'm focused on programming.

Although I spend so much time programming, I'm not perfect. Even though asking peers for help may seem degrading, I see it as a learning opportunity.

Overall, coding taught me not only useful skills but also the value of a great community.

4. What's the most meaningful thing you've made?

Describe for us the single most significant (to you) thing you've made and why it holds such importance. You might tell us about what challenges you encountered while making this, and how you went about solving these issues. This is an opportunity for you to help us better understand you as a maker.

The most significant, challenging, and fascinating project of my developing career was creating a digit identifier using AI for MOSTEC.

As part of the MOSTEC program, I enrolled in Machine Learning and learned basics for training a computer. Although we were given limitations on what we can do, my partner and I went beyond the expectations of our instructor to pursue an advanced project.

Although we struggled at first, we persevered to finish this project by the time the MOSTEC conference happened. We worked so hard that our software output the correct answer to a user input about 98.67% of the time.

Even though my peers and teachers were impressed with our project, the experience made me realize that yes, I wanted to keep doing this. Even if I ended up doing something else as a career, I wanted to cherish those moments in high school when I did something I truly loved.

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PORTFOLIO

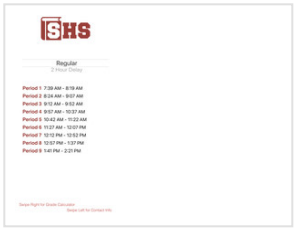
Daniel Park - MNIST Digit Recognition with Deep Learning MOSTEC

The following document represents our progress throughout our MOSTEC project.

The first stage is us analyzing the data and determining whether or not there were missing or corrupt values in the dataset. We also chart what our images look like and how many of each number there are in the dataset. We then split the pictures into arrays so the computer can analyze them.

The second stage is training the computer to recognize the hand-drawn digits. The software trained through ten epochs to reach a final accuracy of about 98.26%. However, we were determined to increase the accuracy rate through data augmentation by rotating the images by a small number of degrees to create new training images. After optimization using data augmentation, we reached an accuracy of about 98.76%!

The third and final stage of our project was testing our data. We asked other MOSTEC participants to submit their images. The computer was able to analyze almost all of them with perfect accuracy.



IMG_1036

Section of School App that displays my high school's multiple bell schedules.

IMG_1035

My school's grade calculator that displays someone's final grade based on how well they did each quarter.

IMG_1034

This screen shows what kind of day it is today or tomorrow for our school's period schedules.

IMG_1033

This screen is the home screen of the Syosset High School Mobile App. The screen also shows the mission statement of my school.