Varun Mehrotra

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EDUCATION

9/2017 - 6/2021	**East Brunswick High School (EBHS)** Weighted GPA: 4.74	East Brunswick, New Jersey

WORK EXPERIENCE

2/2019 - Present	**Knowt, Inc. (https://www.knowt.io/)** *Frontend Developer (2/2019 - 8/2019), Backend Developer (8/2019 - Present)* Knowt is a learning platform seeking to make learning easier for students and teaching easier for teachers, using machine learning to convert students' and teachers' notes into review quizzes and assignments to offer students a better way to learn. My responsibilities include: ▪ As Frontend Developer, programmed UI components for the web app in ReactJS. ▪ As Backend Developer, responsible for building secure APIs and algorithms for the platform ▪ Gained skills in AWS cloud technologies SageMaker, Lambda, DynamoDB, S3, Cognito, API Gateway, AppSync, WAF, and EC2	5-8 hrs/week 52 weeks/year

STEM ACTIVITIES

9th - 12th	**East Brunswick FIRST Robotics (EBFI)** *Programmer (9th - 10th), Co-President (11th - 12th)* EBFI is both a robotics team and nonprofit organization which participates in the FIRST Robotics Competition and is dedicated to spreading STEM in the community through outreach events. ▪ As Programmer, worked on computer vision, PID, and created a system for the robot to function autonomously ▪ As Co-President, expanded the coding team, created more extensive training for new coders (and moved it online during the pandemic), mentored a local FLL team, secured funding for the team, managed all projects/activities in the coding team and oversaw certain aspects of the electrical, CAD, mechanical, and nontechnical teams ▪ Montessori Outreach Event: Planned and helped teach a robotics summer camp to local preschoolers ▪ Rutgers Innovation and Entrepreneurship Expo: Presented our robot to Rutgers students and local companies ▪ Middlesex County Fair: Showcased our robot at the yearly county fair to spread the interest of STEM in the community	10-13 hrs/week 52 weeks/year

9th - 12th	**East Brunswick Public Library (EBPL) Geek League** *Volunteer* Geek League is a community focused organization helping to bridge the digital divide. We seek to empower our community by offering services and supporting digital learning that aid people who do not have access to technology. ▪ Initiated and established the partnership of Geek League with HourChildren and orchestrated a series of workshops on Microsoft Office, G-Suite, mathematics, and web design to help incarcerated women reenter the workforce. Due to the popularity and continued interest, we are currently scaling up this effort by extending it to additional participants. ▪ Assisted people in the community to advance their knowledge about technology and develop core computer skills.	3 hrs/week 30 weeks/year
10th - 12th	**EBHS Science Olympiad** *Member (10th -11th), Secretary (12th -- Elected)* ▪ Participated in STEM-based events in regional and state-level competitions that involved test-taking and building in the subjects of physics, electrical engineering, and computer science. ▪ As secretary, organized virtual tryouts during the pandemic, presided team meetings, and managed all communications within the team. ▪ Created a video about Science Olympiad to garner interest in the club.	3-5 hrs/week 20 weeks/year
11th - 12th	**EBHS Science Honor Society** *Member* ▪ Organized a robotics booth at EBHS Science Night, a science-based community event, to inspire an interest in robotics for elementary school kids around the community. ▪ Tutored students in science as part of science honor society. ▪ Planned and executed an entirely virtual induction ceremony during the pandemic. ▪ Created various content for the induction ceremony to socialize the purpose and importance of Science Honor Society.	2 hrs/week 35 weeks/year
11th - 12th	**EBHS Mu Alpha Theta** *Member (11th), Secretary (12th -- Elected)* ▪ Member: provided tutoring to other kids in our district in math. ▪ Secretary: responsible for pairing tutees with the most effective tutors based on the tutee's needs, and collaborated with the board to create an online tutoring system during the pandemic.	2 hrs/week 35 weeks/year

SOFTWARE PROJECTS

9/2020 **Virtual Guard**

During HackMIT 2020 challenge, collaborated with my friend to create the Virtual Guard application in response to the increased number of school shootings in recent years. Smart cameras deployed with VirtualGuard software in a school detects unidentified person or a gun in the frame, alerting the security guards and sending text alerts to teachers/students with a profile of the person and their current location in the building. Schools upload images of authorized people such as teachers, students, administrative staff, to detect unidentified people through face recognition using Azure Face API.

- Developed smart camera script with OpenCV Python library to detect a person using the Histogram of Oriented Gradients algorithm and detect a gun using a Haar Cascade algorithm in the frame.
- Created a web-based dashboard to view camera feeds and integrated with Azure Face API to identify authorized people vs. potential unidentified intruders.
- Integrated with Twilio API to send text alerts to teachers/students.

5/2020 - 6/2020 **Safe Stores**

Safe Stores is an app developed in response to COVID-19 that crowdsources information about grocery stores. It allows the user to input information about each visit, like the stock of different kinds of food, and to rate the safety measures, such as social distancing and sanitation. Users can then track the grocery stores they visit for the inventory levels and effectiveness of the safety measures at the store based on the experiences of others.

- App is written in Reactive Native and backend services were developed using AWS cloud native technologies DynamoDB, Lambda and API Gateway.

2/2020 - 3/2020 **Bass Mentor**

Analyzes a Double Bass player's left-hand technique and makes suggestions about how the player can improve on these techniques. Inspired by my own Bass learning, I wanted to help those without access to formal lessons in a school system or the general public.

- Developed in Python using OpenCV and CMU's OpenPose model to analyze left-hand technique.
- Using Flask, the tool displays generated hand key points/analysis of technique comparing expected vs. actual key points.

8/2019 **Bike Lane Finder**

As an avid bike rider, attempted a solution to use image processing to detect bike lanes for bikers. Created a convolutional neural network that identifies if there is a bike lane in an image. The app was developed in Python using TensorFlow library to build the convolutional neural network.

MUSIC EXPERIENCE

9th - 11th
2017 - PRESENT

CJMEA Regions Orchestra, — 8 hrs/week
Double Bassist — 4 weeks/year

CJMEA Regions Orchestra involves a rigorous blind audition, involving the preparation of a solo piece and scales, and a sight-reading section. Double bassists in the Central Jersey area compete for 10 spots in the orchestra.

- Advanced over years on the placements within the orchestra:
  - 9th Grade: 5th Chair
  - 10th Grade: 2nd Chair
  - 11th Grade: 1st Chair

9th - 11th
2017 - PRESENT

NJMEA All-State Orchestra — 8 hrs/week
Double Bassist — 4 weeks/year

Double bassists from the regional ensembles throughout New Jersey compete for 10 spots in the NJMEA All-State Orchestra. Players are selected based on a more rigorous blind audition involving a solo, scales, and sight reading.

- Advanced over years on the placements within the orchestra:
  - 9th - 10th Grade: 3rd Chair
  - 10th - 11th Grade: 2nd Chair
- Experience of performing under a collegiate conductor at the New Jersey Performing Arts Center (NJPAC.)

9th - 10th

New Jersey Symphony Orchestra (Youth Symphony Orchestra) — 3 hrs/week
Principal Double Bassist — 30 weeks/year

- Led and performed in the double bass section of the orchestra.
- Assisted other members in learning music and helping them become better players.

10th - 12th

EBHS Tri-M Music Honor Society — 1 hr/week
Member — 15 weeks/year

- Helped set up and performed at concerts for senior citizens at the local assisted living center.

9th - 10th

Veritas Youth Orchestra — 2 hrs/week
Double Bassist

- Playing in the double bass section, exercised my passion for music while also helping others, as I helped plan, rehearsed for community concerts.
- Raised funds for the Rohingya refugees through concerts performance for charity.

RECENT SOLO REPERTOIRE

- Domenico Dragonetti's Concerto in A Major
- Serge Koussevitsky's Valse Miniature
- Giovanni Bottesini's Concerto No.2 in B Minor
- Antonio Vivaldi's Cello Sonata No. 3
- Johann Sebastian Bach's Cello Suite No.1 in G Major
- Benedetto Marcello's Cello Sonata No. 4

HONORS & AWARDS

11th **USA Computing Olympiad (USACO)**

- Promoted from Bronze to Silver division.

11th **New Jersey Science Olympiad States Competition**

- Placed 6th out of 30 teams for the Detector Building event, where I made a durable temperature sensing device to accurately measure and display temperatures of different water samples and took a test on how thermistors work.
- Placed 6th out of 30 teams for the Machines event, where I constructed a lever-based measuring device to determine the ratio between two masses and took a test on mechanics.

11th **Princeton University Science Olympiad Medal**

- Achieved 6th out of 56 teams in the Data Science event at the Princeton University Science Olympiad competition, which involved a test on statistics, Python, and machine learning, including a section where I wrote code to solve programming problems.

SKILLS & TALENT

Technical Skills

- Programming language experience includes Java, Python and JavaScript.
- Web development using ReactJS, HTML, and CSS.
- Experience with cloud native technologies on AWS (SageMaker, Lambda, DynamoDB, S3, Cognito, API Gateway, AppSync, WAF, and EC2).
- App development experience with Android Studio and React Native.
- Proficient with Microsoft Office and Google Workspace (G-Suite).
- Video editing in DaVinci Resolve.

Soft Skills

Planning, Decision Making, Delegation, Mentoring, Collaboration, Conflict Resolution, Communication, Problem Solving, Team Building, Empathy, Resilience, Adaptability, Community Outreach.

Languages

- Fluent in English.
- Proficient in German.