2020 AYSI-SCI
SUMMER CODING INSTITUTE

Post Program Report

A summer program hosted by the
Association for Young Scientists & Innovators

AYSI-SCI Advisory Board Approval Form

Upon review of the 2020 Association for Young Scientists and Innovators' Summer Coding Institute (AYSI-SCI) Final Report that follows this form, I hereby certify that I approve of the successful execution of this event by signing below.

Digger Chen	*[signature: Digger Chen]* F69A8E2D3F1B4DB...	8/31/2020
Printed Name (Board Member)	Signature (Board Member)	Date
Jian Liu	*[signature: Jian Liu]* 5C721D51A2D74B5...	9/1/2020
Printed Name (Board Member)	Signature (Board Member)	Date
Yu Meng	*[signature: Yu Meng]* BE9CD27E8D7942B...	8/31/2020
Printed Name (Board Member)	Signature (Board Member)	Date
Haipei Shue	*[signature]* 3B93917D5B7D40F...	9/2/2020
Printed Name (Board Member)	Signature (Board Member)	Date
Sam Su	*[signature: Sam Su]* D3CD6586FB0F486...	9/1/2020
Printed Name (Board Member)	Signature (Board Member)	Date
Helen Tian	*[signature: Helen Tian]* 9646CDEC368F439...	8/30/2020
Printed Name (Board Member)	Signature (Board Member)	Date
Kelvin Xu	*[signature: Kelvin Xu]* 9482ADADE90A440...	8/31/2020
Printed Name (Board Member)	Signature (Board Member)	Date
David Yan	*[signature: David Yan]* 57D35DA44FCE4E3...	9/1/2020
Printed Name (Board Member)	Signature (Board Member)	Date

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Our Mission

INNOVATING FOR IMPACT

The 2020 AYSI Summer Coding Institute (AYSI-SCI) provided students with a unique opportunity to explore cutting edge topics in computer science and artificial intelligence. Our vision is to empower young students not just with technical skills but also the mindset of innovating to impact the world.

At a high level, AYSI-SCI functions upon 3 goals:

1 Establish strong foundations of programming and artificial intelligence fundamentals

2 Engage with real world applications of computing technologies

3 Empower students to create their own software applications to solve problems in their communities

The program was held in 2 separate age-based divisions:

JUNIOR DIVISION 6th-8th grade	SENIOR DIVISION 9th-12th grade
• Programming syntax, logic, flow, etc. with MIT App Inventor 2 • Basic introduction to AI concepts and applications • Software/AI deployment on smartphone apps	• Introduction to machine learning and artificial intelligence • Implementing AI models and algorithms using Python libraries • Deploying AI on smartphone apps for real-world usage

The Association for Young Scientists & Innovators is a 501(c)(3) non-profit, student-led organization aimed at promoting scientific research and technological innovation through mentorship in science & engineering competitions. Between October 2019 and February 2020, AYSI members have won a combined 91 international, national, state, and regional awards.

Organizing Committee

AYSI-SCI was organized by a group of 28 dedicated and passionate teaching staff. The team also featured an 8-person advisory board consisting of CS/EE experts, lawyers, activists, and leaders.

Program Chair

Kevin Meng

Kevin is a passionate innovator who enjoys developing technical projects that solve real-world problems. He is an Intel ISEF Best in Category Winner, ACM Cutler-Bell Prize Winner, Coca-Cola Scholar, and has presented his AI research at venues including the NSA, IEEE, AAAI, ACM, AAAS, and 7-Eleven R&D Labs. As Founder & CEO of ArcGen Technologies LLC, Kevin is actively collaborating with high-tech companies on cutting-edge AI solutions. He was admitted to MIT, Harvard, Stanford, and UT Honors Programs.

Lecture Program Committee Leads

Derek Qin

Derek is a senior at Plano West Senior High School and attending Caltech in Fall 2020. He is a 3x Best of Category Winner at the Dallas Regional Science Fair and physics researcher at Boston University's X-Ray Diffraction Laboratory. Derek is also a USA Physics Olympiad Medalist and a 6x AIME Qualifier. As a Chapter President of Intellichoice, he coordinated volunteer math tutoring for low-income neighborhoods. At Plano West, Derek serves as the co-President for the QuizBowl team, where he specializes in science.

Yingjie Wang is a senior at Plano West Senior High and a rising CE freshman at Columbia University. She is a seasoned science fair competitor, passionate artist, and mechanical engineering researcher at the UT Dallas Alan G. MacDiarmid NanoTech Institute. Yingjie has won 2nd Grand Prize at TXSEF and many national art accolades. She is fascinated by the intersection of robotics, CS, and art, specifically in augmented reality and interactive digital graphics.

Yingjie Wang

Competition Program Committee Lead

Andrei Spiride

Andi Spiride is a senior at Plano East Senior High and rising EECS freshman at MIT. Andi has participated in science fair for 5 years and has won awards at state, national, and international competitions. Along the way, he has helped mentor students through the LASER club at his school. Andi has participated in top fairs and conventions such as ISEF, JSHS, and AJAS. In his free time, Andi enjoys swimming and playing soccer.

Admissions & Scientific Review Committee Lead

John is a rising senior at Plano West Senior HS. In the sciences, John has earned honors such as ISEF Finalist and Special Award Winner, AJAS Fellow, and USNCO Semifinalist in addition to international conferences and publications. John also co-founded CASH Club Corp, an international stock investment club in addition to becoming a national finalist in the KWHS Stock Investment Competition and an Eagle Scout. He also has finalized in several national entrepreneurship competitions and has been named as a Coolidge Senator.

John Rho

Logistics Committee Leads

Anirudh is a senior at Plano West Senior High and will be attending UT Austin. His passions stem from finding innovative solutions to help those afflicted by life-threatening medical conditions. He is currently pursuing research about axon regeneration to help patients afflicted by nerve-related injuries. Anirudh has also served as President of Biology Club and Neuroscience Club. He has served as President of the National Honor Society and pursued his passion to help the community by founding a nonprofit to help underprivileged students.

Anirudh Sudarshan

Rachel Mammen was a finalist in both the 2019 and 2020 International Science and Engineering Fairs. In 2018, Rachel competed in the Texas Junior Academy of Science and won Second Grand Prize in Life Sciences, thus becoming a Fellow of the American Junior Academy of Science. She has also competed three times at Texas Science and Engineering Fair, earning First and Second Place in 2017 and 2018. At the Dallas Regional Science and Engineering Fair, she has won Grand Prize Runner-Up twice, three First Places, and one Third Place.

Rachel Mammen

Noah's interests lie in the newly emerging biomedical, microbiological, and genetic research sectors. His most recent science fair project sought to investigate a potential gas barrier created by particle cementing bacteria for soil implementation, which qualified him for ISEF and a medical internship at UT Southwestern (STARS). Noah is also a 4x TXSEF finalist. Noah has also found a niche in music. He has performed as principal trombonist in a Wind Ensemble, jazz band, and full orchestra, and served as Band President and Brass Captain.

Noah Mathai

Public Relations Committee Leads

Alay Shah is a rising senior at Plano West Senior High School conducting research in computer vision & AI. He is a two-time National JSHS Grand Award Winner and an Intel ISEF Finalist. He has been awarded the annual Air Force research grant and is sponsored and funded by the Department of Defense and NASA. He won Grand Prize at both the Texas Junior Academy of Sciences and the Texas JSHS for two years. Alay is an AJAS Fellow, 3-time TXSEF award winner, and a published author in 3 international journals.

Alay Shah

Charles Hou is a rising junior at Plano West Senior High School. Charles is a 3x TXSEF finalist, 2x Special Award Winner, TJAS 3rd Place Grand Prize winner, and 1x AJAS Fellow. One year, he used specialized software to develop potential medicines for malignant skin cancer. Outside of science fair, Charles was a team captain for the Jasper Speech and Debate Team and has received many national-level accolades in speech and debate.

Charles Hou

Teaching Staff

Julia Camacho
Denton, TX

Julia is an incoming freshman at MIT, where she will be majoring in computer science and molecular biology. She is passionate about computational oncology and believes that machine learning and AI will revolutionize healthcare. She has won top awards at Intel ISEF, TJAS, and DECA, and is a national winner of the NCWIT Aspirations in Computing Award. At the Texas Academy of Math and Science, she served as Director of Competitions for the Research Organization and VP of the AI Society.

Maximilian Du
Manlius, NY

Maximilian is a senior at Fayetteville-Manlius High School in Upstate New York who is passionate about working with machine learning models, as well as tinkering with electronics. He is a 2-time Intel ISEF Finalist, a Broadcom MASTERS Finalist, and a Regeneron Science Talent Search Scholar. He has presented/published his research at an IEEE International Renewable Energy Conference, and he has also partnered with a local museum to introduce artificial intelligence to children. Among other colleges, he was admitted to MIT, Stanford, and Yale, and will be attending Stanford in Fall 2020. In his free time, he enjoys "making," playing tennis, writing, and polishing rocks.

Rhythm Garg
Denton, TX

Rhythm, a rising freshman at Stanford University, believes in going beyond the buzzword by understanding the underlying mathematics and specific practical applications of emerging technologies. Having served as President of the Texas Academy of Mathematics and Science Math Club and Founder of the AI Club, he has been uniquely positioned to communicate the math behind AI. He has won awards at the Intel ISEF, 2019 Inventor's Challenge, Putnam Mathematical Competition, AIME, Intl DECA Business Competition, and several hackathons.

Kabir Jolly
Houston, TX

Kabir is a senior at the Academy of Science and Technology and a rising freshman at Stanford University. He will be studying CS and is passionate about the intersection of AI and social entrepreneurship in fields such as healthcare. Kabir has been competing in science fairs for 6 years and is a Regeneron STS Scholar, TJSHS Winner, and 3x ISEF finalist, placing 3rd and 2nd in 2018 and 2019. Beyond science fair, Kabir is the President of the DICE Entrepreneurship Club and has competed at the DECA ICDC. He enjoys playing tennis and working on CS-related projects in his free time.

Brandon Wang
Plano, TX

Brandon Wang is a rising freshman at the University of Pennsylvania – Wharton majoring in management and technology (M&T). He is a Regeneron STS Scholar, Robotics World Championship semifinalist, MIT THINK Winner, and published author. As captain of the Plano West debate team, he led the team to top awards at the Texas State Tournament, Harvard Invitational, and other national tournaments. Brandon is also a director of Be the Light Youth Association, where he organizes speech and debate programs to empower students across Texas.

Brendon Matusch
Sudbury, Ontario

Brendon Matusch is an incoming freshman at Stanford University. He has been researching subjects related to machine learning for several years and has presented his work at events including Intel ISEF and Nvidia GTC. He has interned at SNOLAB applying machine learning to dark matter detection, and at the Vector Institute researching unsupervised exploration in reinforcement learning. He also has experience programming robots and autonomous vehicles and participated in the FIRST Robotics Competition.

Aman Singh

Aman Singh is a Turing Scholar (CS Honors Major) at the University of Texas at Austin. He graduated from the Texas Academy of Math and Science, where he conducted research in Machine Learning, specifically Natural Language Processing, at the HiLT Laboratory. Aman's skillset revolves around upper-level math, algorithmic development, and data science. He scored a 9 on the AIME, is a member of the USACO Gold Division, and won HackUTA 2019 with a project that automatically creates slideshow presentations on the fly.

Arnold Venter

Arnold is a junior at Plano West Senior High. He is passionate about the sciences and has been a perennial contestant of the Engineering Mechanics and Embedded Systems categories in the Texas State Science Fair for the last 4 years, with 1x first place and 2x 2nd place awards and numerous awards from Texas Instruments and TerraCon Consulting and at the regional level. As acting president of TJ Maths, a middle school tutoring group, Arnold also strives to connect with and help others in his community dream and do great things.

Navya Ramakrishnan

Navya Ramakrishnan is a sophomore at Jasper High School and is an aspiring computer scientist. She loves math, science, and programming. She works on many research projects that focus on the application of machine learning in the field of medicine, specifically with an emphasis on early detection of diseases. She has won many awards in Regional and State Science and Engineering Fairs and has presented her project in the American Junior Academy of Sciences in Seattle. Additionally, she helps the community through her leadership in school organizations such as the American Red Cross and Science Olympiad clubs.

Rithvik Ganesh

Rithvik Ganesh is a sophomore at Jasper High School. He is a member of math, chemistry, and research clubs at school and has competed in science fairs for years. He enjoys research and strives to make an impact on the lives of Alzheimer's patients worldwide. Rithvik won the 2018 National MATHCOUNTS Team Championship and received first-runner up at the Discovery Education 3M Young Scientist Challenge. He enjoys Android Application Development and hopes to share his knowledge with peers in the field.

Guest Lecturers

Jesse Stauffer
Mark Cuban Foundation
6/4: *Introduction to Artificial Intelligence*

Rajesh Ranganath
New York University CIMS
7/21: *Checking AI & its Application to COVID*

Advisory Board

The advisory board provided oversight and approval of the AYSI-SCI program and schedules. It successfully monitored the execution of plans via two board meetings.

Yu Meng, Chairman
Ph.D. Comp Sci & M.S.E.E.
IEEE Senior Member

Jian Liu
Ph.D. Electrical Engineering
M.B.A.

David Yan
M.S. Computer Science
Technologist

Kelvin Xu
M.S. Geophysics
Tech Entrepreneur

Digger Chen
Ph.D. Pharmaceuticals
J.D. Attorney

Sam Su
M.S. Comp Sci & Math
Technologist

Haipei Shue
Asian-American
Commentetor & Activist

Helen Tian
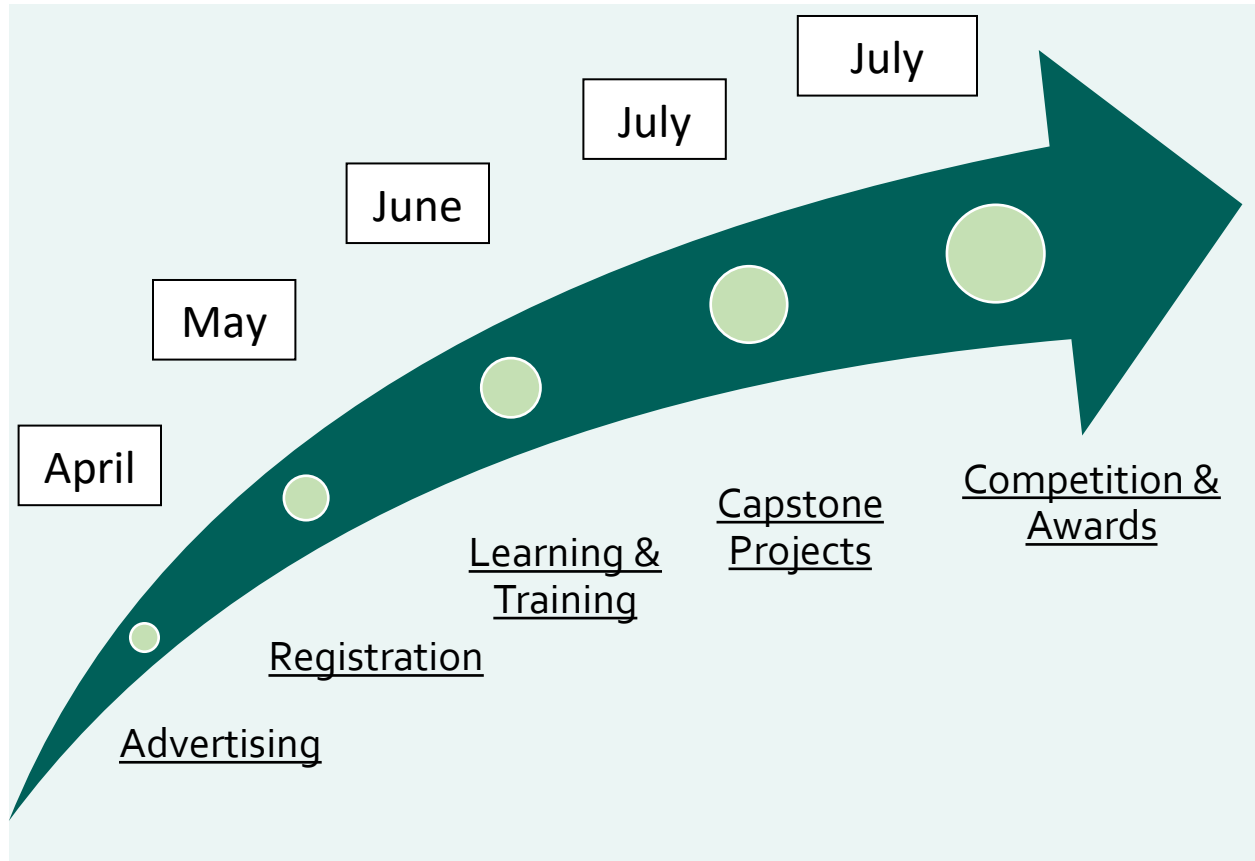Ph.D. Computer Science
Technologist

Advisory Board Meeting Materials

Two advisory board meetings were successfully conducted: one several weeks prior to the camp's start, which allowed for final review of all plans and lesson materials, and one halfway into the lecture program, which allowed the board members to evaluate the progress of students and ensure that plans were being executed properly. Below, the meeting minutes, slide decks, and video recordings have been linked.

Board Meeting Date	Meeting Minutes	Slide Deck	Video Recording
18 May 2020	PDF Link	Google Slides Link	YouTube
14 June 2020	PDF Link	PPTX Link	YouTube

Program Timeline

OVERVIEW OF OPERATIONS

April

May

June

July

July

Advertising

Registration

Learning & Training

Capstone Projects

Competition & Awards

IMPORTANT DATES

- Flyer Release: April 18
- Zoom Information Session: Apr 25
- Registration Begins: April 27
- Lecture Program: June 1 – June 26
- Competition Program: June 29 – July 29
- Final Competition Preliminary Rounds: July 30 – July 31
- Finals Day & Awards Ceremony: August 1

Lecture Program

Junior Division

1. Understand the basics of programmatic thinking
2. Learn how programming languages are used to create applications
3. Study principles of project design and steps of app development
4. Utilize programming skills and the phone features to create an app

Name	Lecture Content	Walk-Thru Project	UI Elements
Introduction Yingjie Wang	• Set up AI2 account • Layout of AI2: where everything is • Using the Companion • "Hello World!" • Objects and Variables • Basic Event Handlers	Simple Calculator: Math operations from 2 text box input	Button, TextBox, Label, Image, Various Arrangements
	Take-Home Project: Create a Quadratic Formula solver		
Logic Alay Shah & Derek Qin	• Boolean basics • Comparison operators • If statements • If-Else statements • Nested If statements	Movie Ticket Checker: check if a person is eligible to watch a movie based on age and parental consent	Button, TextBox, Label
	Take-Home Project: Create a 4 function calculator using 2 text box inputs; catch errors using If statements		
Data Types Yingjie Wang	• Numerical types • Numerical operations • Strings and chars • Text operations	Biography Generator: generates a short biography about a person given inputs such as name, age, school, etc.	Button, TextBox, Image, Label, Various Arrangements
	Take-Home Project: Create an app that takes an input describing the weather ("67 degrees and sunny.") and provides clothing suggestions		

Loops Alay Shah & Derek Qin	• For loops • Variations of the For loop • While loop • Break statement • Nested loops • Synergy of loops + conditionals	Passage Search: searches for specific words in a given text passage and displays the number of occurrences	Button, Switch, TextBox, Notifier, Various Arrangements
	Take-Home Project: Create an app that simulates rolling dice to estimate the probability of obtaining a certain value		
Functions Andrei Spiride	• What is a function? • Abstraction • Functions with parameters • Functions that return a value	Word Processor: given an input passage, use functions that calculate word count, character count, etc.	Label, Various Arrangements, Button, Switch, Notifier
	Take-Home Project: Create an app that can calculate key statistics (sum, mean, median, range) from 5 sorted number inputs		
Data Structures Aman Singh & Derek Qin	• Lists • Dictionaries • List methods • Dictionary methods • Iteration and data structures • Nesting data structures	Contact Manager: App that stores personal information and allows the user to scroll between different entries	Button, TextBox, Image, File, Screens
	Take-Home Project: Create a planner app that can keep track of agenda items such as homework, sports, and classes.		
Drawing/Animation Yingjie Wang & Arnold Venter	• Images and sounds • Canvas • Drawing • Sprites • Event handlers	Side Scroller Game: Simple side scroller with ability to jump over obstacles	Button, TextBox, Image, Canvas, ImageSprite
	Take-Home Project: Create a paddle ball game where the user controls a paddle at the bottom of the screen and tries to prevent a bouncing ball from getting past the bottom of the screen.		
External Storage/Information Derek Qin	• File/local storage • CloudDB internet database • Alternative database options	Pictionary: One user draws an image on their screen, which is uploaded to CloudDB	Canvas, CloudDB

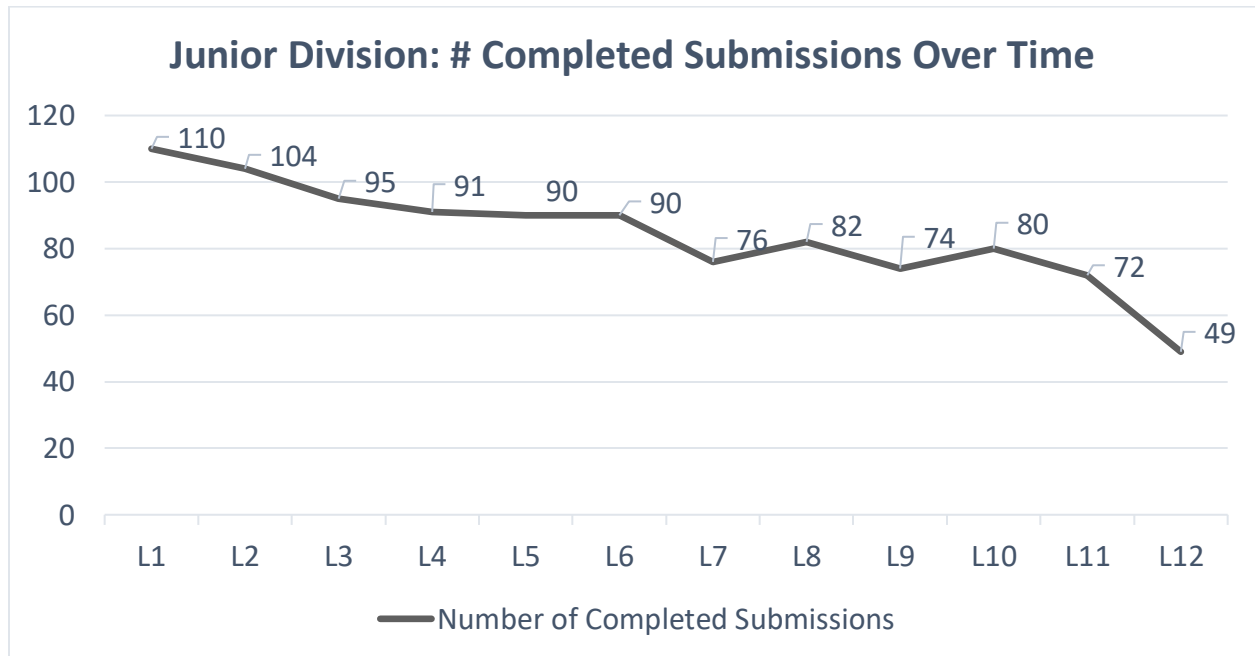|			
	• Useful methods	and reflected on the other user's screen	
	Take-Home Project: Update a previous homework app with support for online or database storage		
Web APIs and JSON Aman Singh	• What is JSON? • What is an API? • Using APIs to access different services (Google Maps, weather, etc) • Error codes • API Request	Weather Ticker: Retrieve information from weather API and display location, current temperature, and an image of the weather	Button, Label, Image, Web, Notifier
	Take-Home Project: Add onto Walkthrough project by adding a feature that displays weather forecast for the nest 3 3-hour intervals		
Sensor Usage Rithvik Ganesh	• Different sensors/apps • Uses and applications of sensors • Accelerometer, barcode scanner, barometer, clock, location sensor, etc	Screen tilt game: The player navigates through a maze by tilting the screen, which controls a ball.	Canvas, Accelerometer, Sprites
	Take-Home Project: Create a map that you can pin your location on, with sensor measurements such as the temperature, barometer, pedometer step count, etc at that location		
Device Interconnectivity, IoT, and Big Data Kevin Meng	• Inter-device communication using Wifi and Bluetooth • Introduction to IoT and Big Data	Phone Activity Analysis: Crowdsource data about when people are most active on their phones by sending phone data to a single cloud server.	Web PUT and GET requests, Various Arrangements, Images, Data Structures
	Take-Home Project: Crowdsource data about magnetic field strength in different locations and display readings on a map		
Artificial Intelligence Yingjie Wang & Aman Singh	• What is Artificial Intelligence? • What is Machine Learning? • Machine Learning Pipeline	Rock Paper Scissors vs. AI: Teach computer how to play Rock-Paper-Scissors.	None

	Take-Home Project: Add image classification unlock feature to planner app and train the model on pictures of your face

Junior Division Classwork, Homework, and Office Hours

Take-home projects were assigned after each lesson. Since lessons were held 3 times a week for 4 weeks, these take-home projects were not meant to be created "from-scratch". Rather, they were designed to extend or build upon the Walk-Through Projects students build during each lesson. An answer key containing a model solution and common fallacies was provided each time. Teaching assistants and lecturers were available both via Discord and Office Hours to answer questions for students.

Junior Division: # Completed Submissions Over Time

Data points (Number of Completed Submissions):
- L1: 110
- L2: 104
- L3: 95
- L4: 91
- L5: 90
- L6: 90
- L7: 76
- L8: 82
- L9: 74
- L10: 80
- L11: 72
- L12: 49

Legend: Number of Completed Submissions

1013 assignments turned in

150,000 blocks of code written

Senior Division

1. Understand the machine learning pipelines
2. Study popular machine learning tasks and paradigms
3. Learn to apply Python libraries to implement AI applications
4. Utilize Android Studio to deploy AI applications in real-world smartphone applications

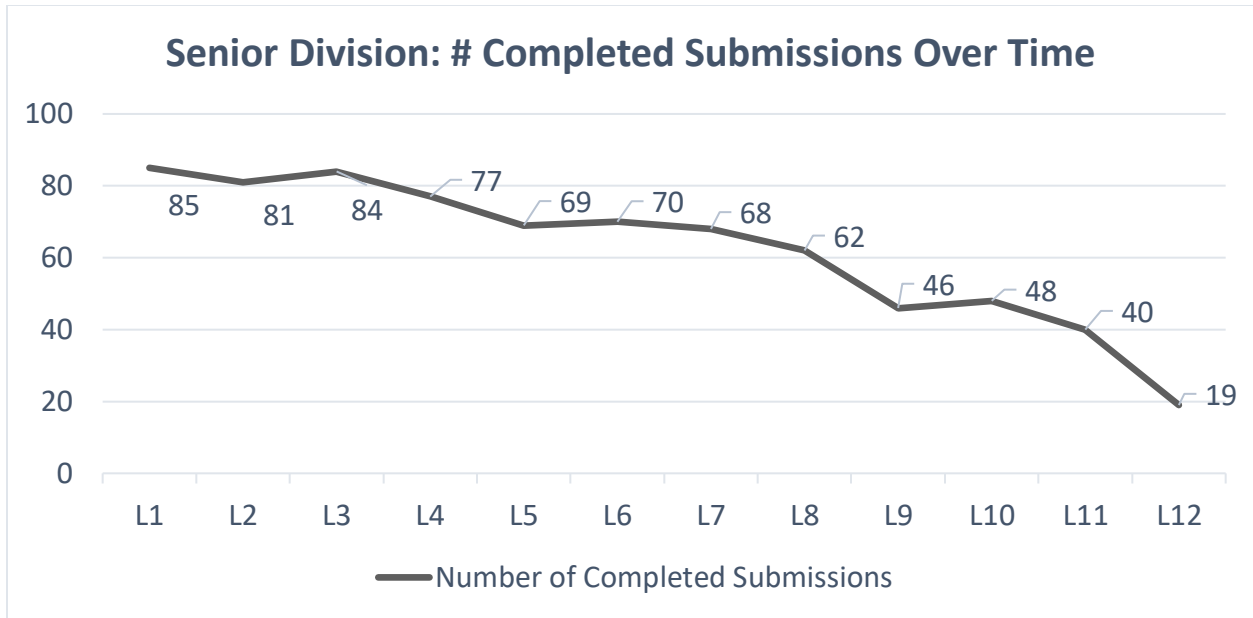| Name	Lecture Content	Walk Thru Project	Technologies
Python Review #1 Kevin Meng	• List comprehensions • Ternary operators • Slicing arrays • Join, enumerate, zip • String format • Lambdas, maps, and cast • Assertions • Classes and inheritance	Building a class and testing each tip/trick out	Python 3, Repl.it, Jupyter Notebook
	Take-Home Project: Hackerrank Problems		
Python Review #2 Andrei Spiride	• Numpy: array creation, indexing/slicing, math • Matplotlib: plotting datapoints • Pandas: loading files, data view/manipulation	Applying library calls to analyze a dataset	Python 3, Numpy, Pandas, Repl.it, Jupyter Notebook
	Take-Home Project: Analyzing and visualizing diabetic data		
Introduction to AI/ML/DL definitions Mark Cuban Foundation	• Basic terms • Machine learning pipeline • Supervised vs unsupervised machine learning • Underfitting vs overfitting • Bias-variance tradeoff • Training vs test data • Cross validation	Demos: • Handwritten Digit CNN • Cancer segmentation video • Handwritten text generation	n/a
	Take-Home Project: Experiment with the Google Teachable Machine		
Classification Navya Ramakrishnan	• SVM, Decision tree • Mention: KNN, Naive Bayes, Logistic Regression etc.	Identifying patients with significant risk factors for breast cancer	Sci-Kit Learn KNN, SVM, Metrics, Linear Model

	• Classification metrics: F1, precision, recall, accuracy		
	Take-Home Project: Iris dataset classification using a variety of models		
Clustering Rhythm Garg	• K-means • Feature agglomeration • Applications: Anomaly detection • Elbow method	Customer clustering to optimize recommendations and advertising	Sci-Kit Learn Feature Extraction, Clustering
	Take-Home Project: Applying clustering to analyze the iris dataset without pre-defined labels		
Regression Maximilian Du	• Cost functions • Gradient descent • Linear regression • SVM/Tree regression	Implementing linear regression from scratch using numpy	Sci-Kit Learn Linear Model
	Take-Home Project: Implementing ridge & lasso regularization from scratch to prevent overfitting on a hand-engineered dataset		
Artificial Neural Networks Julia Camacho	• Neuron structure • MLP structure • Backpropagation • Classification/regression	Applying MLPs to predict survival on the Titanic based on socio-economic features	TensorFlow, Google Colab, Fully-Connected Layers
	Take-Home Project: Handwritten Digit Recognition with MNIST		
Deep Learning: Computer Vision Kabir Jolly	• Convolutional layers • Features extraction • Classification tasks • YOLO (bounding boxes) • Segmentation tasks	Classifying cells as normal or parasitized using CNNs	Google Colab, TensorFlow, CNN Layers
	Take home Project: Image classification with the CIFAR-10 dataset		
Deep Learning: Temporal Modeling Brandon Wang	• Recurrent cells • Vanishing gradient/LSTM • Classification on discrete, signal data • Sequence generation	Generating music	RNN Layers, LSTM Cells, TensorFlow, Google Colab
	Take-Home Project: Weather forecasting with LSTM networks		
Deep Learning: NLP Kevin Meng	• Word embeddings • Seq2Seq models • LSTMs + transformers (e.g. BERT, XLNet)	Joint CNN-LSTM image captioning model: feature extraction component	RNN layers, LSTM Cells, Google Colab, TensorFlow

	Take-Home Project: Joint CNN-LSTM image captioning model: recurrent sequence generation component		
[Reinforceme-nt Learning](#) Brendon Matusch	• State, action, and reward • Deep Learning with RL • Applications of RL in in gaming, robotics, scientific discovery, etc.	Playing Atari games using Deep Q Networks	Local Python environment, VS Code, OpenAI Gym, TensorFlow
	Take-Home Project Experiment with Deep Q Networks in the OpenAI gym		
[Android Studio Part 1](#) Rithvik Ganesh	• Interface/Introduction - Gradle, IDE, Emulator, Testing • Layout/User Interface Design - Manifest, strings, styles, templates	Fragment Tabview (multiple tab view with basic UI elements)	Android Studio with Gradle Configuration
	Take-Home Project: Create an app with buttons that apply various transformations (resize, recolor, etc.) to a text box		
[Android Studio Part 2](#) Rithvik Ganesh	• ConstraintLayout: XML and GUI editing • Buttons, EditText, Dialogue, Notification • Programming - Design, Intents, Functional Use Cases, SQLite Databases • Agora.io Audio/Video	Custom Text Note Taking App (with skeuomorphic design and layout)	Android Studio with Gradle Configuration, Notification Builder, SQLite, Pending Intents
	Take-Home Project: Create a to-do list		
[Android Studio Part 3](#) Rithvik Ganesh	• TF/Keras • Testing/Deployment - Google Play Store	Object classification with CNNs and TensorFlow Lite	MLkit, TF/Keras
	Take-Home Project: Handwritten Digit Classifier: use MLP from Lesson 7 and a canvas widget to classify user-drawn digit sketches		

Senior Division Classwork, Homework, and Office Hours

Take-home projects were assigned after each lesson. Much like in the Junior Division, these assignments were meant to extend or build upon the Walk-Through Projects students build during each lesson. Answer keys containing model solutions and common fallacies were provided each week.

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Senior Division: # Completed Submissions Over Time

85 81 84 77 69 70 68 62 46 48 40 19

— Number of Completed Submissions

749 assignments turned in

125,000 lines of code written

Overall Lecture & Office Hours Figures

Student spent roughly 5,100 hours in lectures and office hours over the course of the program. Moreover, over 600 hours were spent out of class watching YouTube video recordings. In this manner, we deduce that the recordings were very valuable to students who needed to re-digest information outside of lectures.

5,100 hours
Spent in Lectures & Office Hours

30 videos
Lectures + Office Hours on YouTube

3000+ views
On Recordings *Outside of Class*

Competition Program

Following the 4-week Lecture Program, students formed groups and developed software applications that solved problems they observed in the community. At the conclusion of the Competition Program, students made final presentations over Zoom. The students' work was evaluated by a panel of qualified judges. Winners were awarded trophies and prizes.

Group Formation

Students worked in groups of up to 4 to investigate a problem and devise a solution using skills learned throughout AYSI-SCI's lecture program. Depending on grade level, students competed in either the junior or senior division.

For the Junior division (6th-8th grade), students completed an application form that asked for current abilities regarding presentation skills, prior knowledge in math and computer science, as well as UI design. Student participation in extracurricular activities and clubs also played a role in assessing which students will work best together. Our goal ensured that students learned to work together cohesively to develop a solution.

In the Senior division (9th-12th grade), a similar process was implemented. Additionally, there was a short programming challenge that participants were required to take. This competition acted as a screening process to ensure that students were sufficiently prepared and equipped to tackle new problems with the skills learned during the lecture program. Once again, teams were grouped based on their performance and ability in prior lectures and challenges. Team members were encouraged to learn from each other's strengths.

38 teams	30 teams	88%
In Junior Division	In Senior Division	Of Groups Submitted a Project

Supplemental Lectures

During the Competition Program, AYSI-SCI organizers implemented the following supplemental lectures in order to help students and teams collaborate on, design, and present their capstone projects. The lectures included content about the software development cycle (SDLC) and how they can go from planning their systems to implementing them with the help of APIs and tools. AYSI-SCI mentors with previous presentation experience also helped teams create and deliver presentation pitches for the final competition.

Name	Lecture Content
Introduction to Software Engineering	- Software Development Life Cycle (SDLC) - Documentation - Debugging strategies - Planning and research - Possible resources
Presenting Your Work	- Slide design - Public speaking - Collaboration and coordination during presentation - Interview tips
Checking AI via Testing and its	- Prof. Rajesh Ranganath, NYU Courant - AI's implications in healthcare and diagnostics

Office Hours

Although lectures were less frequent during the competition phase, office hours were held 2 times a week over Zoom for 1 hour each. Students could ask questions during this time and converse with mentors regarding different advanced topics that might not have been covered during the main lecture program.
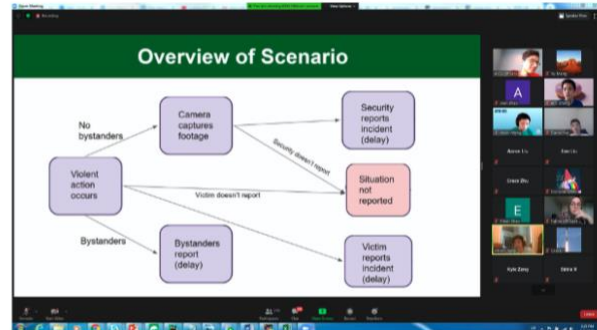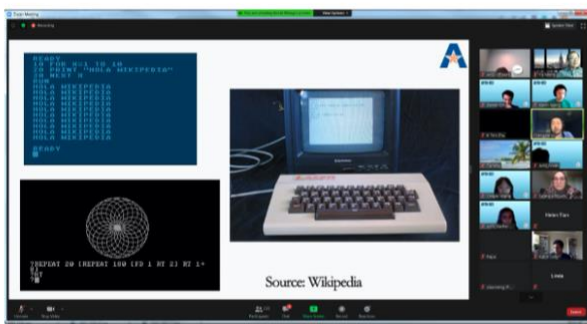
Presentations

Once teams completed work on their projects, they presented their work to a panel of judges to compete for prizes. The competition was carried out in 2 phases.

During the **Preliminary Competition Round**, each group was given a 4-minute presentation with 2 minutes for Q&A. These presentations were conducted over 2 days. Out of

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all teams, 8 (4 junior + 4 senior) were selected for the **Final Competition Round**. This final round was broadcasted publicly, and students provided 5-minute presentations with 3-minute Q&A periods. Awards were announced following the final round, and the winners can be found below in the "Award Ceremony" section.

Students were encouraged to take presentations seriously and follow proper presentation etiquette. Presentation time was intentionally set to be 3-5 minutes to guide students to be concise yet specific about their research. During the question period, judges asked questions that forced students to think critically and explain the decisions they made along the development process.

Within their presentations, students were encouraged to mention the motivation for their research, their process for developing a solution, as well as their results and any demonstrations, if applicable. Students also mentioned any software, APIs, or any other technologies used when developing their solutions.

Group performance and grading was conducted based on a rubric that considers the overall presentation. In addition to being assessed on content, students were encouraged to include any videos or graphics that will help judges better understand their research. Students were highly encouraged to thoroughly rehearse their presentations, and all group members were required to participate when explaining their project.

Judging

 Group presentations were judged based on the rubric below, adapted from the International Science and Engineering Fair (ISEF) Rubric. It is important to note that in addition to being graded on the effectiveness and ability of the solutions they create, roughly ⅓ of the points were earned from the presentation portion. This includes the Q&A session as well as any visuals, videos, or other aspects of a presentation. The table below breaks down the point-system used for judging.

Research Problem (10)	Design and Methodology (15)	Execution & Testing (20)	Creativity (20)	Presentation & Interview (25)
Practical problem solved	Exploration of alternatives	Demonstrates intended design	Resarch Problem	Clarity of ideas & diagrams
Criteria for solution	Identification of a solution	Tested in multiple conditions/trials	Design / Methods	Thoughtful answers to questions
Explanation of constraints	Design of a prototype/model	Demonstrates skill and completeness	Execution	Understanding of fundamental concepts

After spending four weeks completing a project and putting a keynote slideshow together, teams from both the junior and senior divisions presented their work to a panel of judges over Zoom. Project judging spanned over the course of one week, encompassing 4 preliminary rounds (2 for each division) and 2 final rounds (1 for each division). Our judges engaged with students during the Q&A sessions, using the ISEF rubric to guide their evaluations as well as their own personal inquiries for the presenters. The following AYSI affiliates participated as judges during the competition:

Judge Name	Type	School & Major
Aman Singh	Junior Division	Freshman at UT Austin, CS
Max Du	Senior Division	Freshman at Stanford, CS
Brandon Wang	Senior Division	Freshman at UPenn, CS
Julia Camacho	Senior Division	Freshman at MIT, CS and Biology
Kabir Jolly	Senior Division	Freshman at Stanford, CS
Eric Zhang	Finals	Sophomore at Harvard, CS + Math Concurrent BA/MA
David Yue	Finals	Sophomore at Stanford, CS
Fatma Arslan	Finals	PhD Student at UT Arlington, CS

After the competition program, students will continue to work on their research and improve their applications based on judges' suggestions. We encourage students with strong research to enter their projects into the 2020-2021 Science Fair cycle, which, until further notice, will be virtual like AYSI-SCI was.

Awards Ceremony

Students were graded based on their research and presentation and were ranked and awarded money prizes by our judges. These awards vary depending on place and division. The AYSI officers were extremely impressed with what our students were able to engineer in such a short period of time.

OPENING REMARKS

To kick off the event, we invited Dr. Chengkai Li, Professor of Computer Science at the University of Texas at Arlington, Founding Director of the Innovative Data Intelligence Research Laboratory, and Associate Chair of the UTA CSE Department, to provide a few opening remarks. Prof. Li shared stories and anecdotes from his young childhood to illustrate how meaningful programming was to him, ultimately passing this enthusiasm and passion onto the students.

Chengkai Li
Professor & Assoc. Dept Chair
UT Arlington

GUEST REMARKS

Several distinguished guests were invited to share a few words about their thoughts on the AYSI-SCI program and final project presentations. The invited guests including special individuals from AYSI's main sponsors: ams AG, ACP Foundation, and CAST-TX.

Mike Lusk
Executive Vice President
ams AG

Angela Chen
President
CAST-TX

Qiang Gan
President
ACP Foundation

JUNIOR DIVISION AWARD WINNERS

Junior Division students were equipped with basic computer science tools after the lecture program and used this knowledge to develop powerful phone apps, tackling problems ranging from COVID-19 to carbon dioxide emissions.

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Prize	Project Title & Team Members	Prize
1st Place	• **COVID-19 Clinic App:** Carah Su, Ellen Zulkarnain	$200 + Trophy
2nd Place	• **Plagiarism App:** Ayushi Salva • **MediLinked:** Eshan Jolly • **House Stability Detector**: Donovan Zhang, Kevin Su, Andrew Ye • **COVID Contact Tracing:** Kevin Hong, Everett Jin, Doan Nguyen • **OurMovies:** Snigdha Pallikonda, Sanvi Adusumilli, Akshara Immaneni	$100 + Trophy
3rd Place	• **Book App:** Andrew Li, Andrew Yu, Roger Wang • **Music Buddy:** Richard Li, Luke Ting, Milo Grossman • **Family Finder:** Yincheng Qian, Yiyoung Liu, Max Yan • **Hydraulic Flume Simulation:** Ava Cui, Sophia Zhu, Eric Teng	Trophy
4th Place	• **Carbon Dioxide Reduction:** Om Gautam, Vaidehi Zanwar, Avni Rathi • **The Dog Dictionary:** Audrey Liu, Kaitlyn Fan, Yuan Dong • **COVID-19 Case Tracker:** Aum Patel, Prateek Satish, Vikraant Singh • **Grade Face ID:** Alan Zheng, Anjali Vashisht, Rishav Mehta • **Happiness Game:** Yihan Pu • **EduProject:** Ethan Djajadi, Allen Zhang	Trophy
Honorable Mention	• **Nnews:** Neel Vashishtha, Anshul Khandekar, Steven Sun • **Problem-based Coping:** Bailey Dong, Catalina Zuo, Rebecca Huang • **Kids Adventure:** Eunice Jiang, Alanna Sun, Erika Xu • **ObesitySolve:** Karl Hui, Jane Wang, Hollis Lin • **Secure Messenger App:** Elliott Zhang, Oscar Surendranath • **Expired Products:** David Qin, Caitlin Wee, Isaac Hui • **Dangerous Animal Classification:** Sally Wang, Kevin Zhang • **The Way of Sensors:** Clement Wang, Jeremy Chang, Lyndon Yang • **Tax Estimator:** Mark Yin, Matt Zhang, Terence Chen • **Gardening App:** Andrew Wang, Kevin Sun, Oscar Li • **Learning App:** Kristie Min, Iris Yu, Cara Xu • **Music on Mental Health:** Myriam Hochard, Henderson Zhang • **The SOS Emergency App:** Kelton Chen, Suhani Goyal, Vincent Wu • **Fade:** Andy Li, Michelle Bao, Melinda Hu • **Book Finder:** Vivian Wang • **Meal Suggestor:** David Liu, Samuel So, Jackson Zhang	Certificate

SENIOR DIVISION AWARD WINNERS

Senior division teams took innovative approaches with their projects, synergizing ML/AI concepts like computer vision for image classification with a variety of real-world issues like waste management, security, and chemical detection. Our judges noted the novelty and potential of projects and encouraged team members to carry their research into science fair.

Prize	Project Title & Team Members	Prize
Grand Prize	• **A System for Identifying and Protecting Endangered Species:** Evan Yu, Michael Zheng, and Alex Cheong	$1000 + Trophy
1st Place	• **SUDS: Soap Underwater Detection System:** Ethan Zhao, Alan Zhao, Aaron Liu	$300 + Trophy
2nd Place	• **Alert System for Reducing Car Accidents Due to Driver-Related Mistakes:** Grace Zhu, Eddie Xu, Kyle Zeng • **Fast Violence Detection in Surveillance Videos with Deep Learning:** Eric Yang, Albert Jiang, Judah Frenkel, Kevin Lu • **Arch A-Eye:** Kylee Hong, Ian Chen • **Detecting Underage Alcoholism:** Jeremy Yu, Bill Ma, Matthew Fan	$200 + Trophy
3rd Place	• **ASL Classification:** William Yan, Nathan Ma, Shrey Joshi • **Regression on House Prices:** Kai Tsuei, James Lu, Thomas Lu • **Pocket Recycler:** Jenny Wei, Howard Ding, Olivia Mei • **Classifying Skin Diseases:** Lucy Huo, Riley Yuan, Kaitlyn Hou	Trophy
4th Place	• **SnapCycle:** Praachi Khandekar, Aishwarya Sudharshan, Snaeha Shriram • **DeepFake Image Detector:** Ashley Zhang, Sophia Zhang • **Shield COVID:** Darren Xi, Evan Lai, Jeffery Chen • **Second View Alzheimer's Disease Recognition:** Cindey Xiao, Samarth Bhat, Victoria Li • **Detecting Mask Wearing via ML and Computer Vision:** Anson Chen, Logan Tolbert, Freddie Briden • **Tracking Phone Usage:** Eric Wang, John Dunbar	Trophy
Honorable Mention	• **Heart Health App:** Riya Davar, Ajay Zheng, Ben Rosenberg, Kevin Liu • **Detecting Phishing Emails:** Ellen Sun, Jeffrey Wang, Clare Wu • **Speech-to-text system:** Steven Qiu, Timothy Zhu, Aidan Ye • **Identification of Fake News:** Max Fan, Jacky Xiao, Darwin Xu • **Food Identification App:** Andrew Chen, Alison Zou, Wenyu She • **Poison Ivy Image Classifier:** Jarrod Tung, Grace Kuo, Elise Nguyen • **Face Space:** Ethan Hao, David Cui, Chenxi Zhang • **COVID-19 Prediction:** Kevin Xiang, Joshua Lu, Michael Xiao	Certificate

RISING STARS AWARD WINNERS

The officers were thrilled to see elementary school students enroll in and ultimately compete in the program. Watching students as young as 5th graders and as old as college students participate in AYSI-SCI suggests that computer science will flourish not just in the near future, but for years to come.

To celebrate the achievements of these young students, we awarded the following elementary-school-age campers with the Rising Stars award. These recipients were given trophies, which are pictured in the collage below.

Winners	Elementary School
Karl Hui	Schimelpfenig
Oscar Li	Johnson
Hollis Lin	Cinco Ranch
Clement Wang	Westlake Academy

TROPHIES

Premium double & single-column trophies were awarded to Grand, 1st, 2nd, 3rd, and 4th places.

RAFFLE DRAWINGS

To encourage viewership during the final round of judging, a raffle was conducted. While our competition officers and judges were finalizing placements, the Zoom masters sent a Google Form in the meeting chat. A total of 106 viewers submitted the form, of which 5 entries were randomly selected. The participants won prizes are shown below.

More than a cash incentive, the raffle offered a simple way to get students, parents, officers, and curious outsiders alike connected under a common interest.

Teams who didn't advance were rightly disappointed, but rather than having their

Winners	Prize
• **James Lu** • **Debbie Chang** • **Bill Ma** • **Yvonne Zhu** • **Riya Davar**	 $20 Amazon gift card

elimination deter them from attending the finals round, we sought to get them on the Zoom call. AYSI-SCI was the first taste of science fair for many students, so having examples of top projects and presentations would come in handy when competing elsewhere. Implementing the raffle helped the officers get science fair novices exposed to our winners, which we hope offered inspiration and ideas for adjustment going forward.

Community Engagement

Zoom

Students used the Zoom online video platform to communicate with mentors. Links to Zoom presentations were shared on a meeting-to-meeting basis, and lectures were recorded for students who could not make it to meetings. To facilitate the mentorship process, AYSI-trained mentors screenshared presentations via Zoom. These presentations had been curated by the AYSI team for ease of comprehension in addition to efficacy of instruction. Students could take notes during these lectures, and AYSI instructors offered interactive questions for students to test their understanding. The conference-call nature of Zoom also enabled students to interact with one another through camera and microphone, allowing for enhanced collaboration.
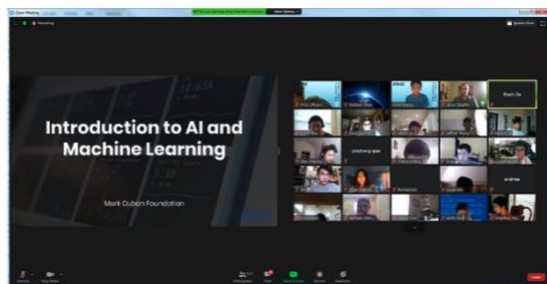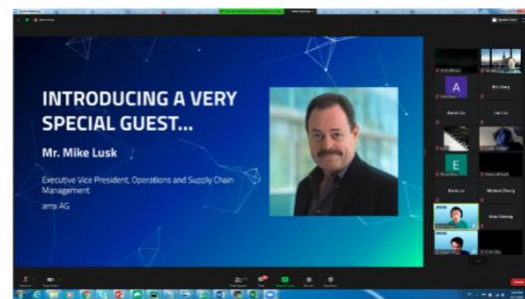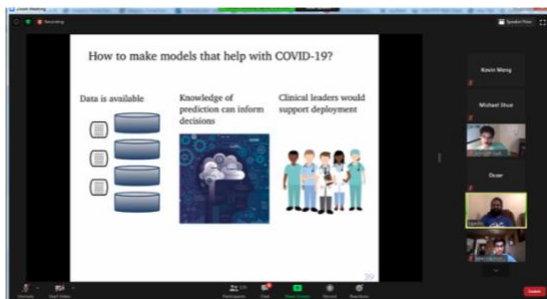
Discord

The purpose of Discord was to offer a unified communication hub for all AYSI members and officers. Discord has a myriad of advanced features, such as video calling and direct messaging, which facilitated communication between all participants. Whenever a student had a question or a problem, they can easily contact an officer or director immediately to resolve the issue. Parents also had the ability to keep in touch with the AYSI team on Discord, and they were free to ask any questions they have pertaining to the program. Our dedicated officer team provided swift responses to any concerns.

Moderators were present on each Discord channel in order to ensure discussions remain civil and on-topic. Violators were subject to punishment with possible removal from channel or termination of program participation without a monetary refund. Specific Discord channels were created to help organize discussion based on topic. For example, one channel could focus explicitly on answering questions about a specific lesson whereas another could be dedicated to students asking each other for more help. Throughout the camp, Discord helped create a collaborative spirit among our members and built a positive learning atmosphere.

14,028 messages in Junior Division

8,830 messages in Senior Division

5,182 messages in General/Leisure channel

30,788 messages sent in total

In the end, the student community on Discord was incredibly vibrant and engaging. More than 14,000 messages were sent in the Junior Division discussion channel, over 8,800 messages were sent in the Senior Division channel, and over 5,000 were sent in the General Discussion channel. In total, 30,788 messages were sent, highlighting the immersive community experience created via Discord!

YouTube

AYSI-SCI held over two dozen lectures and sessions for students to watch and learn from, meaning that there was a lot of information for students to process. In order to aid students' comprehension and provide resources for students who couldn't attend every lecture, every Zoom session was recorded and posted on the AYSI YouTube channel for members to access.

30 lecture and office hour recordings uploaded to YouTube

3,091 views and 611.1 watch hours on lecture recordings (outside of class)

T-Shirts

Staff Shirts		Student Shirts	

Student Collage

Financial Summary

AYSI-SCI was a major financial success for the organization, culminating in over $18,000 raised for the club's operations. Moreover, AYSI was able to award over $1,200 in need-based scholarships to high-achieving students, and the club provided over $6,000 of prizes, t-shirts, plaques, and awards to SCI participants. Money raised during the camp will be invested back into the club for future programs and competitions. Additionally, a portion of our proceeds will be donated to charities and outreach organizations.

$18,000	**$1,200**	**$6,000+**
Raised for AYSI	In scholarships awarded	In prizes, t-shirts, and awards given

Student/Parent Feedback

Quantitative Analysis

After the completion of the program, we sent feedback forms to all students and received ~100 responses. We believe that constructive criticism is one of the most important components to growth and development as an organization and therefore reviewed all of the responses in great detail. In this section, we provide a quantitative analysis of the success of AYSI-SCI.

4.34 Lectures	4.39 TA Help	4.14 Office Hrs	4.05 Homework	4.50 Discord

* All ratings are out of 5 unless otherwise noted.

Survey Categories	Junior	Senior	Camp Overall
Camp Difficulty (/10)	6.33	7.42	6.89
Lecture Quality	4.29	4.38	4.34
Teaching Assistants	4.33	4.44	4.39
Office Hours	4.00	4.28	4.14
Homework	4.04	4.06	4.05
Discord	4.56	4.44	4.50
Email Communications	4.46	4.44	4.45
Value for Money	4.48	4.56	4.52
Overall Experience	4.38	4.48	4.43

As shown above, students found AYSI-SCI highly rewarding, enjoyable, and worth the money. The camp was at the perfect difficulty to simultaneously challenge students and allow them to grow. Out of the six subcategories, the lecture quality, teaching assistant helpfulness, and Discord server stood out as components that students greatly enjoyed. Office hours were rated bit lower, and we infer that this is because few students chose to participate in them. Homework reviews were mixed; some students greatly enjoyed the challenge while others struggled.

Qualitative Analysis

Aside from quantitative ratings, we allowed students to share their thoughts on their favorite and least favorite parts of the program.

Favorite Parts: Students and parents appreciated the thorough organization & design of curriculum materials, clear communication, and friendliness/expertise of the teaching staff. Many students noted that the Discord server enabled them to get quick help on their problems, whether from officers or fellow classmates. They also mentioned that they loved studying advanced topics ranging from IoT and Cloud Databases to Neural Networks and Natural Language Processing. Several noted that the price of the camp was far outclassed by the services that they received. Many students had fun with the walk-through projects and homework assignments, where they could combine knowledge from class with their creative freedom.

Points of Improvement: A small subset of students noted that they couldn't keep up with the programming and mathematics covered in certain lectures. Some also noted that the homework was a little difficult with respect to the content covered in class. In the Senior Division in particular, it was a common request to go over the highly advanced models, algorithms, and programming syntax in more detail. In the Junior Division, many sensors supported by MIT App Inventor were not available on students' devices, so some noted that they couldn't test all their programmed features.

Student, Parent, and Sponsor Testimonials

- This camp was really fascinating. It showed me a whole new application of computer science I thought I would never see. Probably the best part was that everything was so in depth, it wasn't just something like "neural nets learn" and then use with code. Topics were really expanded on so that we could understand the fundamentals. Neural networks in particular are super neat. Just the fact that a computer can learn something so quickly by tweaking certain parameters is really amazing. For a toddler it might take a while for it to classify a digit with 99.9% accuracy, whereas a really thoroughly trained model could take about 3 minutes to get there, or maybe even less. It is just amazing how computer science can even simulate the human thought process. Who knows how much more it can achieve?

- I definitely really enjoyed SCI and found that a lot of effort was put into making a great camp. If there was another camp in the future, I would attend again because I feel I could learn more about computer science while having more knowledge beforehand. Thanks for this great experience!

- I really enjoy problem solving and really enjoyed programming and computer science in general. I can definitely see myself doing it in the future and it is something that will stick with me!

- The animation part of the program made me very excited, for I realized I could make games of my own. I've also realized that I do enjoy learning coding, something which I

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had only done a few times and never had any intention of going back to in the future. But now, after SCI, I've realized that computer programming is something I enjoy and should keep learning over the next few years.

- I find it difficult to express the surprise I felt after my son finished his first two weeks of classes. In the first two weeks, I had to help him digest the class content and finish homework. But after two weeks, I saw a big change. He showed interest and motivation and started to research and seek help from TAs and teammates and finished the homework by himself. After 4 weeks class, he turned himself from coding zero to coding lover. I am so glad I enrolled him into this program and truly appreciate the young teachers, not only their knowledge but also the enthusiasm and love.

- Thank you so much for such a great camp! Thank you for all the parents and the students who arranged the camp for the kids! All lectures were well prepared and presented, all office hours were also well organized! My son really enjoyed this camp and learned tons of new things. The homework kept him very busy every day! We would definitely recommend this camp to others. Thank you again for all your hard work!

- If we could do this even when school starts, that would be great!

- Just wanted to say thank you to all the organizers for running such a wonderful program. It was an incredible experience for many students. All young teachers were so mature, resilient, and strong. They gave students incredible experience. You run a fabulous camp filled with wonderful opportunities, and a lot of kindness and support for the kids, and great communication to the parents. Thanks again!

- What a successful conclusion to AYSI-SCI! I cannot say enough of a "thank you" to the team. I never expected for my son to win the 2nd award. I feel that the award should be credited to your team, first and foremost. And I feel that the boys worked well together. I hope AYSI has an incentive for them to continue working together, improving their project to a level good enough for them to take it to the next science fair. That would be awesome!

- Very impressed by the high quality of lectures delivered, the camp is very well organized, my kid learned a lot, more important is that my kid is getting more and more interested in coding machine learning and related topics. Thanks for providing such a wonderful learning experience.

- It was the first time for ams to sponsor a dedicated STEM program in DFW, and I have to say I'm extremely impressed how effective, efficient and enjoyable it was. Many of the kids came without prior knowledge on AI and app coding. Within a short few weeks, they were able to present tons of innovative projects with many real-life applications, such as COVID APPs. It's simply amazing!

- So glad I decided to attend even though it was totally out of my comfort zone. I learned SO much. Thank you!

- Without exploring the field of AI or how it worked in the past, this program provided a lot of new information that was really interesting. It helped me understand how neural networks functioned in the real world and how to code them in a variety of ways. I definitely see myself learning more about programming and artificial intelligence in the future.
- I think this program gave me a much better insight into what AI actually is. I learned that the fundamentals were just math and that it isn't as hard as I had originally thought it to be.
- I really enjoyed learning how to use and create apps with MIT App Inventor; this camp helped me take a peek into the possibilities and I'm thankful for that.
- I like how simple, yet at the same time complex, MIT App Inventor is. I can definitely see myself making cool projects similar to the ones I made in the AYSI summer camp.
- Truly appreciate all the efforts all the AYSI instructors and officers put into this camp. This is the best camp my kid has ever been in. He has learned not just new technology but the working attitude from all of you. Hope this can continue after the summer.
- From refusing to join classes at the beginning to seeing him eagerly login on time, my son made it and finished strong. How grateful we are to all the people who got him there!! We are looking forward to the future with AYSI.
- As parents, I really appreciate the efforts your team made! Really amazed and impressive. You all provide a good model for those younger students and, I believe, those young students will also find out their passion and vision under your inspiration.
- Best camp ever. And hope it will never end.
- She was not a big fan of computer science before; but since this course, she enjoys this learning pace and solving problems after the lectures by herself. She has an interest now. It is really a valuable experience! Thank you very much Kevin and the team! You are great role models and inspire the kids to achieve and give back. Hope you will organize more camps like this.
- I think that this is a very interesting and informative. I learned alot about coding and I have never ever coded before. Yet, I have already accomplished in coding different apps under the different TAs and lecturers guidance. I used to think that coding was boring and I was uninterested. But this camp has taught me alot and I'm very inspired to learn more.
- It was a great pleasure to have my son join the AYSI-SCI Summer camp to gain technical skills. We are so lucky to have such wonderful instructors and mentors like you and other AYSI-SCI officers!
- Big thank you to the entire team for doing such a great job. Kids learned a lot. Amazing program and hope to do this again next year or in future. Good luck and best wishes.

- As a parent I am very impressed by your passion to share and mentor the coming generations! I wish you all good luck.
- I think that this program has taught me a lot about programming and I now see myself learning more about this topic.
- Thank you guys for being so patient with me. I am super new to coding but you all answered my questions so well. Thank you!!! :))))
- Thank you so much, as all of you sparked a hidden passion that i had for coding. I had an amazing time learning the fundamentals of coding and will definitely continue to pursue my passion for coding and CS.
- I was really excited to learn about neural networks, and I will definitely try to apply some of it to future projects.
- I was overall happy with the experience, and it helps me train, so win-win!
- I really liked the Android Studio part of the program, and this was an awesome gateway into artificial intelligence.
- Out of all the coding camps I went to, I think that this one was the most helpful.
- I think I have come to like computer science a lot more. I see myself learning a lot more in the future.
- A lot of the things I learned here can be helpful for improving some of my personal projects which could be really cool.
- This camp has absolutely helped me gain a better understanding of what I can do in my future as a computer scientist. Although I've always wanted to go into the field of computer science, I've never really had the opportunity to learn about stuff like this, so I'm super thankful to get this opportunity.
- Learning-wise, I encountered a lot of new concepts along with the Python language itself. During the first lecture, I was already very confused with the Python syntax, but I've gained a lot of familiarity working with Python through various projects. I had always been interested in computer science; this course really helped me understand some concepts I may see in the future. I will say it was still very challenging for me, but that's what motivates me as a student. I still may not comprehend 100% of every concept, especially those involving calculus concepts, but I've learned a lot :)
- I do enjoy learning about artificial intelligence and hope to someday change something in this world for the better.
- AYSI has strengthened my passion for computer science. I liked coding before, but now that I've been able to use my new skills to create useful apps, I enjoy it a lot more.
- Great experience, learned a lot about machine learning in general and hopefully this will help me in my future
- Before this summer, I never really explored computer science because I was always focused on physics and math. But now that I have learned about coding and its

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applications, I think I want to put more time into learning what else I can do with python and java.
- I think learning about all the possible applications of ML made me excited. I have always had an interest in computer science and I do see myself learning more in the future.
- I found coding to be much more engaging :)
- This camp has made me want to achieve more in the computer science world and create great things from code.
- I enjoyed learning more about AI but it was a lot to take in.
- This really piqued my interest in AI and programming!

Lessons Learned

Looking at both quantitative and qualitative feedback, we are incredibly pleased and proud to find that students overwhelmingly enjoyed our program. In the future, to better accommodate students who are less familiar with prerequisite concepts, we can consider providing pre-lecture readings, so that students come in with a general idea of what will be discussed. Moreover, to address the consistency between different lecturers, we aim to institute more strict quality control guidelines and spend more time on the preparation of the curriculum and lecture materials.