

YEA NEWSLETTER



Newsletter produced by Young Engineers in Action



YEA Student Board 2022-23. Back row from left: Shawn Wang, Matthew Phan, Alex Cheng, Emily Ren, Rose Kong. Front row from left: Laura Liu, Tracy Han, Derek Di, Bena Feng, Jaden Zhang. Side column from top: Jessica Li, Aaron Pan, Ethan Chiang, Reenie Cao, Joy Xu, and Ben Chen. (Photos: YEA Newsletter reporters)

YEA New Student Board Vows to Promote STEM

Written by: Emily Ren

Young Engineers in Action (YEA) announced its new student board for the year of 2022 on March 1. The new board is committed to organizing more activities in order to inspire a passion for STEM in more students, said YEA President Matthew Phan.

"Transitioning back to in-person learning, we want to expand YEA's reach by continuing many fun programs such as our inventor's club and TARC teams, while also promoting new programs such as a YEA Open House and Hackathon team," said Phan. Currently a junior at Oxford Academy, Phan served as YEA's general secretary last year.

Jessica Li, a sophomore from Oxford Academy, and Emily Ren, a sophomore from Diamond Bar High School, serve as vice presidents of YEA. Also on the executive board are Tracy Han as general secretary and Rose Kong as Chief Technology Officer.

YEA was founded by then high school students Nicholas Fu and Lia Tian in May 2016, and has grown into a non-profit organization with participants actively involved in promoting STEM in local communities.

The new student board of YEA consists of 27 students from various schools in Orange County and Los Angeles County. "We can't wait for all the exciting projects we will produce this year!" the board members said.

Please see Page 10 of the YEA Newsletter (Spring 2022) for a full list of the new student board of YEA.

IN THIS ISSUE:

- YEA Launches Hackathon Team - Pg 2
- YEA Math Olympiad Concludes Competition Season - Pg 2
- Fun Bio & Chem Series to Announce Winners of Latest Round in May - Pg 2
- NASA SL Team from YEA Completes FRR Milestone - Pg 3-4
- Time to Unite Computer Science with Health and Nutrition - Pg 5
- Are Environmental and Racial Justice Connected? -Pg 6
- Robotic Dogs Symbolize A Huge Step in AI -Pg 7
- A Facebook Post Spotlights Interesting Coincidence on Major Pandemics in History -Pg 8
- Psychology Becomes More Popular Than Ever - Pg 9
- YEA Student Board 2022 -Pg 10

YEA Launches Hackathon Team

Written by: YEA Newsletter Reporter

YEA student board launched its own Hackathon team in March. The team welcomes all students who know how to code to join the team and learn the ins and outs of working in a company-level professional environment.

The Hackathon program will provide students with an opportunity to learn the level of detail and quality companies expect from their employees, as well as the opportunity to even work for companies looking to reach out to our youth, said Shawn Wang, computer science director of YEA.

The weekly program will allow students of all ages to come together and share their experiences and knowledge. For those who are pursuing a career in coding or data sciences, this is a great way to dive into work environments suited to their preferred career.

YEA Math Olympiad Team Concludes Competition Season

Written by: Emily Ren

The Math Olympiad Team of YEA has completed all the five monthly contests of the school year, and is currently waiting for the final result.

The Math Olympiads for Elementary and Middle Schools (MOEMS) will send out the award packages the beginning of April through mid May.

The Math Olympiads of YEA consists of about 20 members. They have been competing once a month since November 2021.

Math Olympiad has fostered students' mathematical creativity and ingenuity, as well as the capabilities to think out of the box, students and parents say.

Fun Bio & Chem Workshop Series		64
Tentative Schedule for Future Sessions in 2021-22		
21) Bioinformatics / Computational Biology (3):		5:30 - 6:30 PM, Monday, April 11, 2022
20) Bioinformatics / Computational Biology (2):		5:30 - 6:30 PM, Monday, March 21, 2022
19) Bioinformatics / Computational Biology (1):		5:30 - 6:30 PM, Monday, February 21, 2022
18) Cell Biology (3):		5:30 - 6:30 PM, Monday, January 3, 2022
17) Cell Biology (2):		5:30 - 6:30 PM, Wednesday, December 22, 2021
16) Cell Biology (1):		5:30 - 6:30 PM, Wednesday, November 24, 2021
15) Environmental Chemistry (2) / Green Generation:		5:30 - 6:30 PM, Monday, October 11, 2021
14) Environmental Chemistry (1):		5:30 - 6:30 PM, Monday, September 6, 2021
13) Anatomy & Physiology (6) - Endocrine System:		5:30 - 6:30 PM, Wednesday, August 11, 2021
12) Anatomy & Physiology (5) - Nervous System:		5:30 - 6:30 PM, Wednesday, June 28, 2021
11) Anatomy & Physiology (4) - Sense Organs:		5:30 - 6:30 PM, Wednesday, June 9, 2021
10) Plants (2):		5:30 - 6:30 PM, Wednesday, May 26, 2021
09) Plants (1):		5:30 - 6:30 PM, Wednesday, April 7, 2021
08) Water Quality (Marine Biology / Chemistry) (2):		5:30 - 6:30 PM, Wednesday, March 17, 2021
07) Water Quality (Marine Biology / Chemistry) (1):		5:30 - 6:30 PM, Wednesday, February 17, 2021
06) Anatomy & Physiology (3) - Integumentary System:		5:30 - 6:30 PM, Wednesday, January 6, 2021
05) Anatomy & Physiology (2) - Muscular System:		5:30 - 6:30 pm, Wednesday, December 23, 2020
04) Anatomy & Physiology (1) - Skeletal System:		5:30 - 6:30 pm, Wednesday, November 11, 2020
03) Disease Detectives (2):		5:30 - 6:30 pm, Wednesday, October 14, 2020
02) Disease Detectives (1):		5:30 - 6:30 pm, Wednesday, September 16, 2020
01) Overview:		4:00 - 5:00 PM, Thursday, July 30, 2020

FUN BIO & CHEM WORKSHOP SERIES #20, BIOINFORMATICS (2), EMILY REN

⬆ A slide screenshot of the Fun Bio Chem Workshop Series #20 on March 21, 2022 shows the topics and schedule of the first 21 sessions.

(Photo: YEA Newsletter Reporter)

Fun Bio Chem Series to Announce Winners of the Latest Round in May

Written by: YEA Newsletter Reporter

The Fun Biology and Chemistry Virtual Workshop Series, organized by Young Engineers in Action (YEA), will announce the winners of its latest round in May.

The workshop series, hosted by Emily Ren, a sophomore from Diamond Bar High School, has been held once every month since it kicked off on July 30, 2020. Each session has 10 to 30 participating students, mostly third to eighth graders.

The series has covered a wide range of topics in biology and chemistry, including Bioinformatics (Computational Biology), Anatomy and Physiology, Environmental Chemistry, Cell Biology, Disease Detectives (Epidemiology), Water Quality (Marine Biology), and Plants.

The top winners for the first round (July 2020 to May 2021) were Sanjana Hegde, Farhan Alam, and Darsh Maheshwari.

The top winners for the second round (June 2021 to November 2021) were Nathan Liu and Sanjana Hegde.

NASA SL Team from YEA Completes FRR Milestone

Written by: Emily Ren

The NASA Student Launch Team from Young Engineers in Action (YEA) has recently completed the Flight Readiness Review (FRR) and Payload Demonstration Flight reports and presentations, ready for the official launch in April and the conclusion of their nine-month research and competition program with NASA.

The seven-member team from YEA consists of: Catherine Liu (Captain), Emily Ren (Chief Operating Officer), Lee Marquez (Chief Safety Officer), Neil Marquez (TARC Manager), Rohan Nair (STEM Engagement Officer), Andrew Liu (Outreach Officer), and Jessica Li (Finance Officer).

The 16 high school student teams and 44 college student teams selected into the NASA SL program are required to design, build, test, and fly a payload and rocket to an altitude between 3,500 and 5,500 feet.

Since September 2021, the team has been working hard to meet the multiple documentation and presentation milestones with NASA, and writing hundreds of pages of reports. The milestones



⬆ The NASA SL Team from YEA successfully completed their subscale rocket launch on January 1, 2022. (Photo: YEA Newsletter Reporter)

include: the project proposal and presentation in September 2021, the Preliminary Design Review (PDR) report and presentation in November 2021, the Critical Design Review (CDR) report and presentation in January, the STEM-engagement reports in March, and the FRR and Payload Demonstration Flight report and presentation in March.

The team has been meeting at least two hours a week since September. Due to the time difference, they sometimes need to get up very early to present their reports to a panel of NASA scientists at 6:00 am. "It has been a great learning experience," said Catherine Liu.



⬆ The NASA SL Team from YEA hosted the YEA STEM Night on February 26. (Photo: YEA Newsletter Reporter)



⬆ The NASA SL Team from YEA successfully completed their full-scale rocket launch and their payload demonstration launch on March 12, 2022. (Photo: YEA Newsletter Reporter)

The rocket that the team designed and built carries the payload of three *Mimosa pudica* plants. The team has been conducting a biological experiment on how forces and altitude affect *Mimosa pudica*.

"We are excited to see how rocketry and biology interact with each other in our project!" said Emily Ren, who proposed the payload experiment idea on *Mimosa pudica* to the team. In order to minimize the confounding variables in the experiment, she grew the plants from seeds, ensuring that all the plants in the experimental group and the control group receive the same amount of sunlight and water on a daily basis.

The payload also includes two cameras and two lights connected to a battery charged by a power bank. The plants can be tilted in any orientation during the flight, and the cameras document the opening and closing behavior of the plants.

The team has also been organizing various hands-on educational activities on STEM, which have engaged at least 250 participants. One of the STEM engagement events was the YEA STEM Night at the YEA office on February 26.

The team conveyed their gratitude to their mentor Gregg Halligan, their advisor Paul Liu,



⤴ The team mentor Gregg Halligan (right) was giving advice to members of the NASA SL Team from YEA on December 4, 2021. (Photo: Emily Ren)

and Dr. Tim Fu of YEA for their advice and support throughout the project. "Your support is crucial to the success of the team and to the level we have learned, grown, and achieved in the past eight months," said the team members.

The team is going to launch their official flights in April, and attend the virtual award ceremony organized by NASA in late April or early May.

For more information about the NASA Student Launch Team from YEA, please visit their website at <http://lalcteamnsl.com/> or follow their social media accounts: Facebook: @LALCNSL; Instagram: @LALCTeamNSL; Twitter: @LALCTeamNSL; and LinkedIn: @LALCTeamNSL.



⤴ The NASA SL Team from YEA successfully completed their full-scale rocket launch and their payload demonstration launch on March 12, 2022. (Photo: YEA Newsletter Reporter)



⤴ The NASA SL Team from YEA in one of their weekend meetings. (Photo: Emily Ren)

Time to Unite Computer Science with Health and Nutrition

Written by: Angela Hao

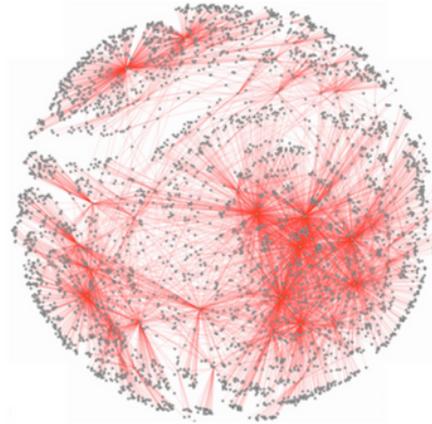
In a world where the international community produces enough food to feed 10 billion people, why are there 690 million people around the world who are undernourished? The key is to unite computer science with health and nutrition. Throughout my five-year long career in Model United Nations, I have analyzed disparities and vulnerabilities in healthcare systems worldwide.

Hoping to address these issues, I participated in City of Hope's Hilton Science and Nutrition Program through which I learned more about the role nutrition plays in health. Investigating solutions to healthcare issues opened my eyes to seeing how to incorporate computer science advancements and technology with solving health problems. On a broad level, computers can provide technology for earlier disease detection, manipulating substances to improve treatments, and mass producing treatments to be more accessible.

Utilizing the power of coding, developers can design programs that not only translate DNA to RNA to then the corresponding amino acids, but also design programs to check for DNA sequencing errors, through analyzing the DNA bases of adenine, thymine, guanine, and cytosine, which can help look for mutated DNA to fight against diseases such as Crohn's disease and hepatitis B.



Health science is closely related to computer science. (Photo: Harvard University)



ExPecto's computer-scanned tissue-specific gene interactions. (Photo: ExPecto)

One such example of a current project that takes on similar goals is the ExPecto created by the Flatiron Institute. This program creates models that map out highly accurate "cell-type-specific predictions of expression solely from DNA sequence." Specifically, it targets DNA mutations that are caused by diseases that lead to tissue-specific gene changes. And thus, ExPecto can predict new diseases from genetic mutation. Utilizing technology, researchers can detect the mutated DNA that is exacerbated by malnutrition such as hepatitis B which commonly plagues people lacking sufficient vitamins, and create nutrition-focused treatments to alleviate the symptoms.

Technology can also take simpler roles in healthcare and medicine, such as being devices that can monitor people's temperatures. One such example is developing computers with webcams that can monitor temperatures via thermal sensors to warn people if they have a fever.

From having AI bots delivering the food to geographically isolated places to mass manufacturing of medical products, technology has rapidly expanded the human potential in different sectors including healthcare and medicine, allowing so many more people to have better access to quality healthcare and higher quality lives.

Are Environmental and Racial Justice Connected?

Written by: Ethan Chiang

The majority of New Orleans (more than 60%) are African Americans, and a lot of them suffer due to the difference in wealth in the area. Hurricane Katrina caused \$125 billion in damages, and the black community was affected the most. They did not have the money to live in safer homes, so they were forced to stay in areas with high flood risk. A lot could not even afford to evacuate before the storm arrived.

Although most citizens who were displaced by the storm were able to improve their economic status over time, many people lost their homes in New Orleans, as over 80,000 living units were destroyed. Nearly 2,000 people were killed, with the majority of fatalities occurring in Louisiana. A significant number of victims later suffered from PTSD, depression, and anxiety.

Natural disasters like Hurricane Katrina cannot be prevented by humans, but people are still disproportionately affected. Minority groups suffered the most, since most of them lived in high-risk neighborhoods such as the Lower Ninth Ward. Reconstruction was even more difficult for minorities because funding was low and



⬆ Lower Ninth Ward neighborhood in Louisiana in 2005. (Photo: Scholastic News)



⬆ Lower Ninth Ward neighborhood in Louisiana in 2022. (Photo: Scholastic News)

inconsistent, and almost nobody had flood insurance. Over time, New Orleans became a mostly white community, as many of the minority groups were driven out due to rumors and the loss of their old lives. The Army Corps of Engineers even built levees that were known to be less adequate for storms, and they spent as little money as possible on them, risking the lives of hundreds of citizens.

So what is being done to promote environmental justice and avoid future errors like these? In 2016, updated federal flood maps moved more than half of New Orleans' population out of the high-risk zone, which resulted in fewer people having to purchase flood insurance. Not only was New Orleans poorly prepared for Hurricane Katrina, but minority populations were affected the most and received the least amount of funding in the reconstruction process.

However, the Lower Ninth Ward, a poverty-stricken neighborhood in New Orleans, has recently been receiving more donations from nonprofit organizations such as Habitat for Humanity and The Green Project. Some of their projects include refurbishing old wood, reusing furniture, recycling paint, and cleaning debris and trash on the streets. It has been more than 15 years since Hurricane Katrina, yet New Orleans is still trying to recover.

Robotic Dogs Symbolize A Huge Step in AI

Written by: Rose Kong

Have you played with a robot toy dog before? They bark, sit, and jump to interact with you. AI dogs are a special type of robotic dog that doesn't bark. They help in more high-level situations such as delivering packages, walking at human speed, and guiding the disabilities. They are programmed to follow specific routes and navigate roads through remote control.

AI dogs are able to do more things than a real dog. It can not only walk up stairs, grass, and gravel, but also can carry heavy equipment, depending on the size of the AI dog. The fastest walking speed of an AI dog is about 20 miles per hour, according to Boston Dynamics. They also have four metal legs, so even if you kick it, it will keep balanced. Therefore, some mining industries and construction companies purchased these dogs to help the workers carry bricks, tools, wood, etc.



⬆️ A \$44.99 robotic dog toy sold in stores. (Photo: Walmart)



⬆️ A robotic dog in front of the Auburn University McWhorter School of Building Science. (Photo: Auburn University)

These dogs benefit people with special needs as well. With the help of 5G connection, AI dogs' visual sensors can predict the friction and height of the ground to adjust itself to adapt to the environment.

Some AI dogs have the function of vision and hearing so that they could easily lead the disabilities from place to place. They act like guide dogs for visually impaired people, but they are more stable and more durable. Currently, scientists are developing a way to put in dialogues to make life even more convenient.

Since this new technology is still under development, there are some flaws. They require precise operations and special equipment before they come in use. If they get too dirty or break a small part, the overall function would decrease. The prices are also a big issue. Most AI dogs cost about \$2000 to \$3000, while the most expensive one is about \$75,000. They are a bit too expensive for a normal income family to afford.

All in all, the AI dog has just started its journey on helping people, but they symbolize a huge step on artificial intelligence technology developments in the world. Let's look forward to the more advanced functions of AI dogs!

A Facebook Post Spotlights Interesting Coincidence on Major Pandemics in History

Written by: Nathan Liu

The Cursed 20th?

A social media post seems to bring premonitions of death. On March 25, an anonymous post on Facebook surfaced, containing information about major pandemics which have occurred in the 20th year of each century. While such a coincidence is absurd, the evidence, from the 1720 Bubonic Plague of Marseille to the 2020 Coronavirus pandemic, all seem to "support" this "hypothesis". However, further research can help people look into the interesting coincidence.

The Bubonic Plague of Marseille (~1720)

The Bubonic Plague was theorized to have been brought from China via the Silk Road. However, in Europe, infected fleas spread the disease to humans, causing 25 million deaths. Despite the tremendous amount of deaths, destruction, and fame across Europe, this disease is not a pandemic. Since its prevalence was only within France and the countries around it, the plague is defined as an epidemic.

Cholera Outbreak (~1820)

Set back in 1817, Cholera emerged in India, traveled through sailors, and ended up in Britain. In the Soho district of London, John Snow, a physician, used plotted maps to locate the source of the deaths. Snow discovered it was the Broad



◀ A poster made to stop the public from spreading germs via spit. (Photo: Philadelphia Archives)



⤴ The Facebook post claiming that a pandemic or epidemic occurs every 100 years. (Photo: Facebook Archives)

Street Pump, and later shut it down. Deaths decreased dramatically in the region, and Snow was hailed as a hero. Shutting down the pump was an example of a public health intervention, something that would be extremely important for the diseases to come. However, due to its time frame, this pandemic does not fit the category that the Facebook post describes.

Spanish Flu Pandemic (~1920)

Although its origins are unknown, the Spanish Flu is thought to have come from China, France, or the United States. Since it was during WWI, it did not receive as much attention as it should have. The disease infected 500 million and killed 50 million. While mask mandates and vaccine testing made the virus similar to the coronavirus, limited technology and experience, resulted in more deaths compared to the six million coronavirus fatalities. However, because it was two years late, the virus does not meet the Facebook criteria.

Psychology Becomes More Popular Than Ever

Written by: Ally Li

Latest statistics indicates that employment for psychologists is expected to rise 8 percent from 2020 to 2030. Correspondingly, the college major of psychology has become increasingly popular in recent years. Students say that learning psychology can help them better understand themselves, better understand others, and offer them various career options.

Psychology is the study of the human mind and how it behaves. It encompasses the many external factors that impact how people think, feel, and behave. The field can be comparable in depth to biological and experimental fields. Although the human mind and behavior has remained a mystery for centuries, psychology has only proven to be an integral part of society in recent years.

Though psychology did not emerge as a separate study until 1879, it can be traced from as early as the time of the Greeks. The idea of psychology started in early philosophy, beginning with Socrates. Socrates studied intentions and of understanding behaviors. His theories



⤴ Brain interprets information from the outside world, and defines how we experience the world. (Photo: popneuron.com)



⤴ Psychology has been gaining popularity in recent years. (Photo: British Psychological Society)

highlighted the relationship between the human mind and body. These ideas carried on as time passed, which contributed to new discoveries in psychology.

Currently, psychology is not just a theory. Professionals now have the resources to develop and experiment with different techniques in research and treatments. Psychology can be found in nearly every aspect of human life. Over the years, psychology has changed rapidly from thoughtfulness to scientific sciences.

Psychology has recently become a popular undergraduate degree choice. Professionals in psychology typically find jobs as researchers or as professors. Psychologists have recently become respected in multiple career fields from businesses to hospitals. People educated in methods of human behavior are known to be an asset to any workplace.



⤴ Psychology major has been gaining popularity in recent years. (Photo: Brown University)

YEA Student Board 2022

President:	Matthew Phan
Vice Presidents:	Jessica Li Emily Ren Tracy Han
General Secretary:	Rose Kong
Chief Technology Officer:	Shawn Wang
Computer Science Director:	Jayden Lin
Assistant Computer Science Director:	Ethan Chiang Ruizhi Zhang
Chief Newsletter Editors:	Emily Ren Jessica Li
Science Director:	Yiyan Qu
Math Circle Director:	Benjamin Chen
Assistant Math Circle Director:	Reenie Cao
Public Relations Director:	Alex Cheng
Fundraising Directors:	Aaron Pan
Inventors Club Director:	Adora Yan
Engineering Director:	Darsh Maheshwari
Web Designer:	Elliot Kang
Board Members:	Bena Feng Grace Zhao Leonard Maeshiro Joy Xu Eshan Jagdish Derek Di Laura Liu Rachel Sui Jaden Zhang Ally Li

YEA Volunteering Program

Are you Interested in volunteering? Do you love STEM? Then you should become a volunteer for Young Engineers In Action!

Reasons why you should volunteer:

- To give back to the community.
- To hone your leadership skills.
- To make everlasting bonds with other volunteers, the Student Board, as well as young students engaged at YEA!
- To fuel your passion for STEM.
- To gain volunteering hours since YEA is a certified organization to authorize and recognize dedicated volunteers with the President's Service Award.

About US

YEA was founded by then high school students Nicholas Fu and Lia Tian in May 2016, and has grown into a non-profit organization with hundreds of participants actively involved in promoting STEM and bringing positive impact to local communities.

Contact US

For more information, please contact us at one of the following:

contact@youngengineersinaction.org
(714) 808-2407
7002 Moody St. #217, La Palma, CA 90623
www.youngengineersinaction.org

YEA Programs:

<https://www.youngengineersinaction.org/programs.html>

YEA Events:

<https://www.youngengineersinaction.org/events.html>

YEA Contests:

<https://www.youngengineersinaction.org/contests.html>

YEA Volunteering:

<https://www.youngengineersinaction.org/volunteering.html>

YEA Newsletters:

<https://www.youngengineersinaction.org/newsletter.html>





**PURCHASE
YOUR YEA SHIRT
TODAY!**

YEA is a nonprofit organization that organizes events throughout the year to enhance students' knowledge in STEM



SCAN THE QR CODE TO ORDER
YOUR YEA SHIRT OR GO TO
[TINYURL.COM/YEASHIRT](https://www.youngengineersinaction.org/TINYURL.COM/YEASHIRT)

Help YEA Student Board organize higher quality STEM events for elementary students!