High-Tech Camps

Editor's Note: Because of COVID-19, many camps are converting to online formats for 2020 or postponing in-person camps until late summer. Check the camp websites for updates.

When the middle-schoolers at The Tech Interactive's virtual reality (VR) camp were unveiling their creations at the end of the week, one student debuted something that went above and beyond.

"In a lot of the VR experiences that the kids created, you're walking through a forest or mountains and you are interacting with other characters, but you're on the ground," explains Jamie Solomon, program director for summer camp at the downtown San Jose museum. "This camper created a program where you're elevated and you're flying through the virtual environment.

"I said, 'Dude, this is amazing!'" Solomon recalls. "You genuinely feel like you're flying because of the different structures you fly around and all the details you can see from above."

In the tech-rich Bay Area, it's not only in virtual reality classes where teens get to test the bounds of reality. Camps exploring the latest in cutting-edge technology abound. Sure, there are many coding camps covering everything from C++ to Python, but there are also more up-and-coming tech offerings – ranging from 3D printing to cybersecurity to artificial intelligence.

Tech camps can be pricey, ranging from a few hundred dollars for half-day camps to several thousand for multi-week overnight camps at major universities. But many parents don't mind springing for tech camp, seeing it as a unique learning opportunity that could also be a launching pad to a lucrative career.

This year, due to COVID-19, many camps are holding live, remote sessions online instead of in-person camp. So some are offering tuition discounts, improving their affordability as well as the commute time.

To make sure you get your money's worth, size up the reviews, the technology (smartphones or new PCs?) and instructor credentials (college students or pros in the field?). And be sure to check for scholarships, which can be sizable.

Developing Artificial Intelligence

One out-of-the box camp is Artificial Intelligence (AI) Camp for ages 13 to 18 normally held at Stanford University.

Michael Zhang, camp instructor and a former head of data at Blend Labs, says that last year's campers built, as their big project, an AI program that can detect people's emotions, ranging from happiness to surprise to anger.

"What's more stunning is that they started with no coding experience and created this AI program in just three weeks," Zhang says.

The field of artificial intelligence – a computer's ability to perceive its environment and learn from data – is decades old, but scientists are constantly innovating applications for it. Amazon's Alexa and Apple's Siri are two examples, as are self-driving cars and machines that identify new medicines and diagnose disease.

Early in the camp, students learn the basics of statistics and the coding language Python. Then, they're ready to explore machine learning concepts, like splitting data into separate sets and creating loss functions, which identify an AI model's failures. From there, they take on data manipulation and neural networks so they can design and build a functional AI program of their choosing.

Campers also explore career options by using data and

experimenting, as they do in AI development. And they get to talk to data scientists on tours of firms such as Blend Labs, Quantifind, Lyft, Uber, Pinterest and Facebook. On the last day of camp, students unveil their AI program to their parents and mentors.

"Yeah, it's epic!" Zhang says.

Last year's campers, in addition to creating the emotion detector, built a website from scratch so anyone can try their app. Check it out at emotion.ai-camp.org.

For high school senior Thomas Chen, the camp was a chance to look beyond engineering, a field he was always interested in.

"Learning data science through real-life experiences helped me realize that there were amazing career paths other than engineering, even if I didn't have previous experience in them," says Chen, who lives in Fremont. He still intends to major in mechanical or computer engineering, but hopes also to learn more in college about AI and the sub-field of machine learning.

"Maybe I'll learn some machine learning on the side to help me better automate the robots I build," he says.

The AI day camp takes place in three-week sessions throughout summer. The fee is $2,999 with scholarships

available. If the coronavirus forces cancellation of camp at Stanford, campers can get a refund or attend AI Camp online for $300 less. Learn more at ai-camp.org.

Exploring Virtual Reality

Junior high-aged campers, meanwhile, can delve into another tech field at virtual reality day camps offered by Galileo Learning. Most summers the camp is featured at schools throughout the East Bay and Silicon Valley, as well as at The Tech Interactive, where the student created the VR experience of flying.

VR, like AI, has been around for years, but recent improvements have brought it to the forefront of the gaming industry. Using smartphones and Unity 3D, a professional-grade programming software, kids at The Tech "start with a blank slate, and throughout the week, build on their skills to add texture, features, lighting and color and all the elements they want to bring their imaginary world to life," Solomon says. "The goal of the week is to give them the tools to build their own experience."

Meanwhile, the students get feedback from each other and from campers in other classes who come learn what they've been doing. Eventually, they don the Google Cardboard headset, insert a smartphone into the back of it and view the show through a lens.

"Getting the chance to put on a headset and dig into what they've created or what their friends have created – that's where I see the most delight," Solomon says.

Like many others, the boy who designed the aerial experience "was genuinely proud of what he had come up with and had been able to pull together within a week," she says. And "he was very excited to see what more he could do with VR."

Virtual reality is one of 18 science subjects for fourth- to eighth-graders usually featured at The Tech. They range from classics like Code Masters and Circuits and Electronics, to kid faves like Movie Magic, Forensic Detective and Animal M.D., to new fields like Environmental Engineer and 3D Game Design. All campers also get to tour the museum and engage with its many colorful, hands-on exhibits.

No specific experience is required for the classes, but "most of our campers at The Tech have a deep sense of curiosity and enthusiasm coupled with basic technical skills," says Nerissa Sardi, Galileo's marketing vice president.

Most years, Galileo offers VR camp not only at the Tech Interactive but at schools throughout the Bay Area; this year it will offer VR in an online format only, Sardi says. A number of other online tech camps are in development as well.

Single-session 90-minute online classes are $40. For more information, visit galileo-camps.com.

Other Tech Camps for Tweens and Teens

Camp Edmo – This year, offers 2.5-hour online sessions twice a day on maker and tech topics. $150 per session per week. Later this summer, it may open camps at schools and parks with themes like YouTube Star 2.0, Geocache Dash and App Inventor. Full-day, weeklong camp starts at $524. See [campedmo.org.](campedmo.org)

Code for Fun – Coding for Minecraft, coding to fly drones, designing web pages and programming the Arduino board to run smart vehicles are among the classes that Code for Fun hopes to offer for ages 10 to 15 at several Bay Area locations. It is currently offering live Virtual Summer Camps for $299. [codeforfun.com.](codeforfun.com)

Education Unlimited – At UC Berkeley and UCLA, Education Unlimited typically offers separate science camps for middle- and high-schoolers. Camps range from the artistic (web design, graphic design and video production) to the classic (astronomy and biology sub-fields) to the futuristic (programming and robotics). Prices start at $1,795 for the weeklong full-day camps and $2,400 for overnight camps. [educationunlimited.com.](educationunlimited.com)

Galileo Learning – Expects to offer several science camps online, including virtual reality. Most years, it also features many in-person camps for tweens and teens with quirky subjects like Chefology, Drone Innovators and Go Kart Builders at more than a dozen Bay Area locations. Price varies by location but cost approximately $500 per week for full-day camp. galileo-camps.com.

iDtech – Features many new virtual camps for spring and summer 2020 in coding, animation and game design. $399 per week for four-hour daily sessions. During typical summers, iDtech offers some 20 STEM classes in day and overnight sessions at Stanford, Berkeley, St. Mary's College in Moraga and seven other Bay Area campuses. Fees start at $929 for weeklong full-day camp. idtech.com.

Techknowhow.com – Online campers ages 11 to 16 learn Python or Java coding as they create games and animations and operate robots this summer. $200 per week for half-day sessions. Some in-person camps may open at locations around the Bay. Full-day camps are $480 per week. techknowhowkids.com.

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