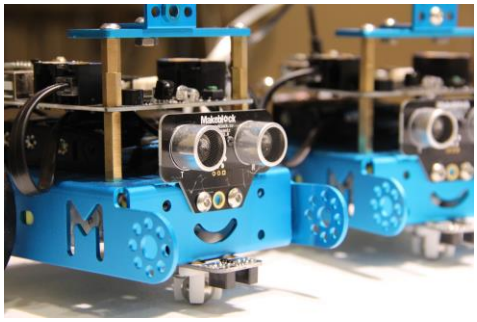
News from PVNet **Silicon Hill** Week 4,

7/4/2016

Located at the Promenade on the Peninsula

We're in the Mall, and We Have it All



We hope everyone had an amazing holiday weekend! Summer at PVNet continues to be fun, engaging, and exciting. Read on for updates about all our classes and projects, and make sure to stop by our location, check us out, and see what *you* could be working on in our one-of-a-kind technology center.

Starting July:

VEX IQ Robotics Teams for Girls & Boys- Registration is open!

2016 Middle School teams are forming this year. Register now at PVNet.com.
2017 High School teams will be formed in 2017. You can still register now at PVNet.com.

Classes

PROSTHETIC HAND FOR KIDS

We have weekly workshops on Monday, Wednesday, and Friday, from 4-6pm! Come in with your family and help us reach our goal of making 40 hands by the end of the summer, which will be donated, through E-NABLE, to kids in need. These low-cost prosthetics can greatly benefit a child who is missing a hand. If you don't have the time to make a hand yourself, you can still help! Sponsor a hand with a tax deductible donation of $160 (or any amount).
You CAN make a difference – let do this together!

STEM UNIVERSITY

STEM University is reporting another great, creative week! In addition to working with the usual Ozobots, LittleBits, and 3D printing pens, the students also got introductions to Autodesk Maya and 3D printing. In addition, students continued their work with Scratch programming language, which they first encountered last week.

3D Printing

Our students love getting their designs printed, so it was fitting that this week they had a section of class dedicated to learning about 3D printing and printers. First, they watched a short video explaining how the printers operated. Then, students got a tour of our 3D printing area and learned about the different types of printers that we have.

So, how do 3D printers work, really?

3D printing is classified as "additive manufacturing", which means that a solid object is created by adding material in layers. Plastic is fed from a spool into a tube on the printer, and then into an extruder, which heats it up and deposits it onto the build plate. The 3D printer, much like an inkjet printer, makes passes over the platform as it deposits the material. When you look closely at a 3D printed object, you can see the layers of material that it was made from. 3D printing has great potential to be used in multiple industries; besides manufacturing, it can create custom prosthetics and even food, such as meat!

Autodesk Maya

3D design and art were combined when the students worked with Autodesk Maya, a 3D modeling and animation software, which is often used during the creation of video games, TV shows, and movies. Have you see the Harry Potter movies? Or the Kung Fu Panda ones? Any Marvel movies? If so, you've seen work done with Maya. Those are just a few examples of the many, many movies that utilize Maya. In fact, since 1997, every film that has won the Oscar for Best Visual Effects used Maya. It's obviously a very important tool for the film industry.

Our students started out with this cool software by making simple shapes and coloring them. They quickly moved on to modeling houses, Death Stars, and swords. Students also learned how to animate their scenes, and made their models rotate, grow, and move exactly how they wanted them to. Student RJ created an cool animation of a pick-ax striking stones. You rock, RJ!

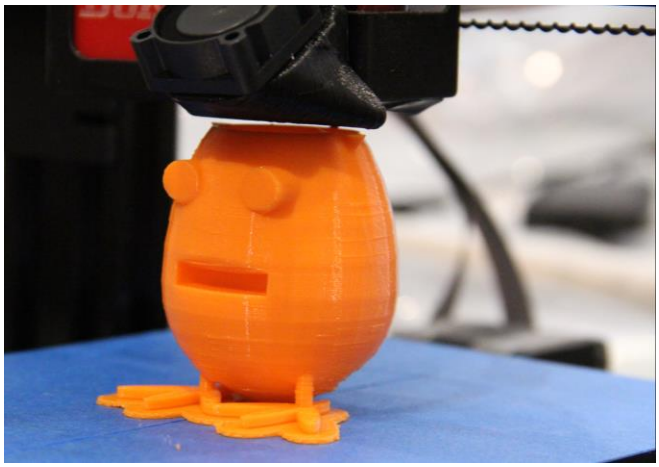
Scratch

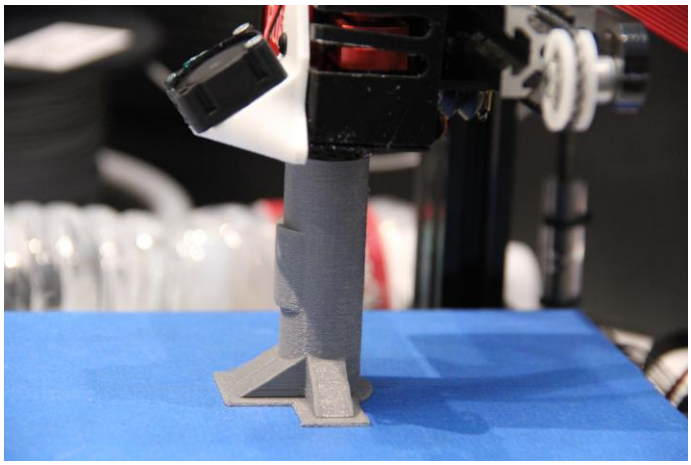
Programming plays a big part in our programs. Our STEM University students are exposed to programming through Scratch, an online programming language developed by MIT.

Don't be fooled by Scratch's cartoony characters and block-based commands; learning Scratch programming language leads students right into advanced coding using ARDUINO, RobotC, and Java. Programming skills are more important than ever, no matter what age you are!

ALERT! We have young inventors in our midst!

Several of our STEM University students are getting so good at Computer-Aided Design that they are inventing, designing, and 3D printing many new models every day. It's a good thing we have lots of 3D printers! See pictures below of their designs getting printed, and of the students holding their finished models.





We had a tech and fun filled week in STEM University, and hope to see our students again next week!

(It's more than just) GAME DESIGN

Why are scientists going back to school to the learn about animation, Virtual reality design and visual technologies? Because every industry utilizes visual media to communicate ideas and concepts. This may sound surprising, but designing for games helps builds programming and math skills. And the only place to design games locally is...you guessed it! PVNet! We offer classes for two game engines, with multiple levels for each. Students learn valuable skills in our classes that will help them in their careers whether they pursue work in the game design industry or not. Come in, and make a game!

UNITY

This game engine created games that can be run on almost any device. Students learned the basics of Unity design game engine, the industry-standard software for creating 2D and 3D games that can be deployed on many platforms. They created detailed worlds, wrote code for their characters using Javascript, and had fun playing around with gravity and other forces of physics. They also created enemy characters and hazardous objects, making their games more exciting.

Unreal Engine

This powerful game engine is used to make Virtual Reality games that can be played using the Oculus Rift and the HTC Vive. Students in this class learned how to make their own game by creating an environment and programming their characters to move, and also got to use our Virtual Reality systems frequently throughout the class time. Now that's unreal!

CODING

Classes

Our coding classes continue! This week, we had workshops in both C++ and Java, two very common programming languages that are used in robotics, websites, game design, applications, and more. Our students learned about different data types and created objects. Programming is an essential skill in our world today, and is used in all industries. PVNet is the place to learn how to code!

Tutoring

If you are struggling in a class or want to learn how to code quickly, tutoring is the way to go! PVNet offers tutoring in all major languages. Schedule your session now!

Projects

GAME DESIGN TEAM:

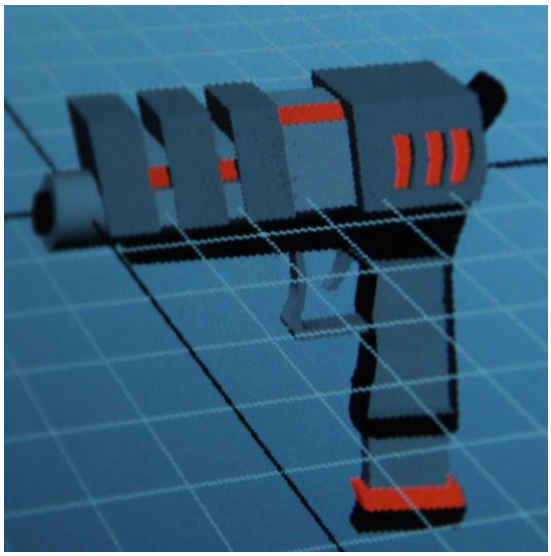
Our Game Design team is hard at work, and well on their way to completing their goal of creating a 3D game that can be played on the HTC Vive!

Many members are creating digital 3D models using Autodesk Maya. Some are making zombies, others are designing weapons and buildings! Check out Aysel's amazing zombie to the left and Lochlan's amazing gun farther down below! Their models are just a couple examples of the cool assets that the team has designed so far.

Modeling

So how do our members manage to create such detailed models? First, they have to search the internet for reference images, or pictures that they can import into Maya and base their model off of. Then, they research! YouTube is a great resource to help beginning modelers. The modelers start to create their assets with simple shapes, and then manipulate edges, vertices and faces to get the look that they want. The body to the left may not look like it, but it started out as just 3 plain cylinders.

Game Design...or Biology 101?



You can't create a realistic or compelling model of a humanoid creature without checking the facts. Have you see Finding Dory yet? The animators for the movie studied ocean life for countless hours as they attempted to model the characters. How else would they know how kelp attaches to rocks, or how octopuses move, or how light changes in the deep sea? They are practically ocean experts now! Modeling and animating requires research in all sorts of unexpected fields.

Besides modeling, we also have students working with Unity to design the environment and create complex programming scripts. The team uses the Vive to test out the program's code, as Michael is doing bottom left. It is very exciting to see the team's progress and devotion to the project. We can't wait to see the final product!

VIDEO PRODUCTION TEAM

The Video Production and News Reporting team has been photographing and recording activities and events daily. This provides an enormous media library that editors can pull from to create interesting videos!

Stop! Professional skills only!

The Team's AVID Media Composer editing skills are growing each week. In addition to working on videos that document the weekly activities at PVNet, they have also been editing intern interviews and brainstorming ideas for the PV Transit PSA project.

Software Check: *In case you were not aware, movie and television industries primarily use AVID, After Effects and Premier. Final Cut is generally used by students and small shops*.

The team edits using Premier, After Effects, and AVID, all industry standard software. We love their work, and are excited to see more of it.

Interns

What have our amazing interns been up to this week? Of course, nothing less than designing grenades and buildings, modeling people, creating game environments, editing videos, making prosthetic hands, 3D scanning humans and objects, and much, much more!

Aysel has finished her zombie model, and is now working on a very complex grenade model. She also helps with the newsletter. Check out her and her 3D-pen printed friend to the right!

Lochlan, our gun model master, has completed his detailed handgun model and is now working on modeling a fantasy gun and a cartoon mouse. He is pictured below with a gear that was printed on one of our 3D printers.

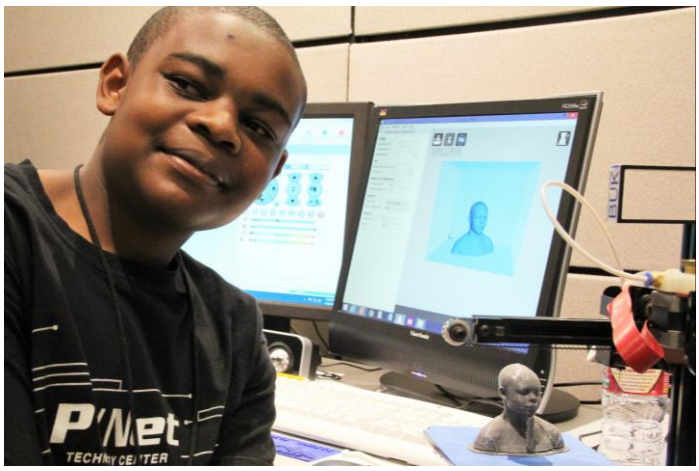
Julianne has been working on modeling female zombies and is also taking Java classes.

Zach and **Brent** are working with our EMOTIV Epoc+, a 14 channel raw EEG (electroencephalogram). They are going to be meeting with **Dr. Carol Francis** to discuss the capabilities of our brain wave sensor and analysis software. The trio will go over how EEG is currently used in the medical and sports industries and what it's uses can be in the future. This will be a wonderful opportunity for our students to interact with a professional and gain valuable insight on the technology that they are working with. Thank you so much for collaborating with us on this amazing technology, Dr. Francis!

Interestingly, scientists at **Binghamton University** are currently using the same equipment that PVNet has to identify people based on differences in brain waves, a sort of biometric identification.

The system works by recording the brain's responses to a sequence of pictures. EEG is perfect for identification because it can't be stolen, unlike fingerprints. This technology is very new, as the researchers at the university just recently announced that they achieved 100% accuracy using this method. Zach and Brent are going to start a project soon where they attempt the same method at PVNet. Mind-blowing!

Kachi and **Eric** are working with the Sense 3D scanner, which creates 3D renderings of objects and people. The scanner uses a laser to collect data about the object's shape, calculated based on the angle of the returning light. The boys are experimenting with a stand for the scanner, and will be scanning all the interns soon. The scans can be edited in Zbrush, and printed on our 3D printers. Take a look at Kachi and his model below left, and Eric getting scanned below right!



Daniel, our 3D printing technician, has been operating the printers all week, in addition to working on his prosthetic hand. He printed these cool Darth Vader keychains to the right!

*Thank you **Sean** for taking the time to help our office organize our paperwork!*

INDEPENDANCE DAY FAIR

On Monday, PVNet had a tremendously successful day at the annual fair in Point Vicente park! Our booth was set up with 3D printing pens and the Oculus Rift for visitors to try. On display was a huge spread of 3D printed art and technology, which amazed visitors. Fairgoers were also intrigued by our Bukito 3D printer, which printed spinning gears that we gave out throughout the day.

We had children and adults alike clamoring to try the Oculus Rift, which gave them an immersive experience on a roller coaster simulator. Meanwhile our 3D pens were in constant use, as visitors created small pieces of unique art. Our awesome interns were on hand to greet visitors, answer any questions about our technology and classes, and offer stickers and gears to awed children.

Thanks to Lochlan, Julianne, Lauren, Christian, Tommy, and Kimi for helping out at our booth. Special shout out and thank you to Aysel and Zach, who volunteered the longest! We really appreciate your time and assistance. **We had so much fun and we can't wait for next year!**

Thanks for reading! See you next week!

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