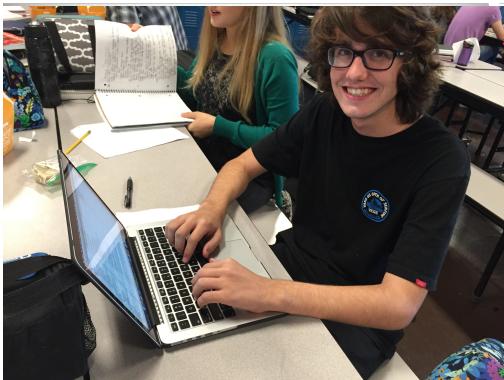


# THE BASIS INQUIRER

## THE BASIS SCIENCE JOURNAL

### Where Can You Learn Computer Science?

By: Anamika Basu



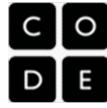
It is important to know that a growing concern is the lack of a computer science education in most elementary schools and high schools especially when computer scientists are in demand for a wide array of professions. According to the College Board, a trusted organization that connects students with college success, there are 150 different career areas interested in hiring computer scientist, from fashion designers to financial analysts.

Before you think about mounting on the vigorous journey also known as AP Computer Science, it may be beneficial to acquire an introduction with the computer science basics. Thankfully, there are many websites online for you to build up your coding skills for free whenever you have access to a computer.

 codecademy

<https://www.codecademy.com/>

Provides an online coding education for free and teaches the languages HTML, JavaScript, jQuery, PHP, Python, and Ruby through interactive and interesting courses.



<https://code.org/learn>

Has great diversity in its courses ranging from beginner to college level classes. Also, this website provides courses on many different languages as well such as HTML and Python.



<https://www.tynker.com/>

For fun and engaging coding games regarding computer science this website is for you.

### Interviews

Teaching Tech with Mr. T (Page 6)

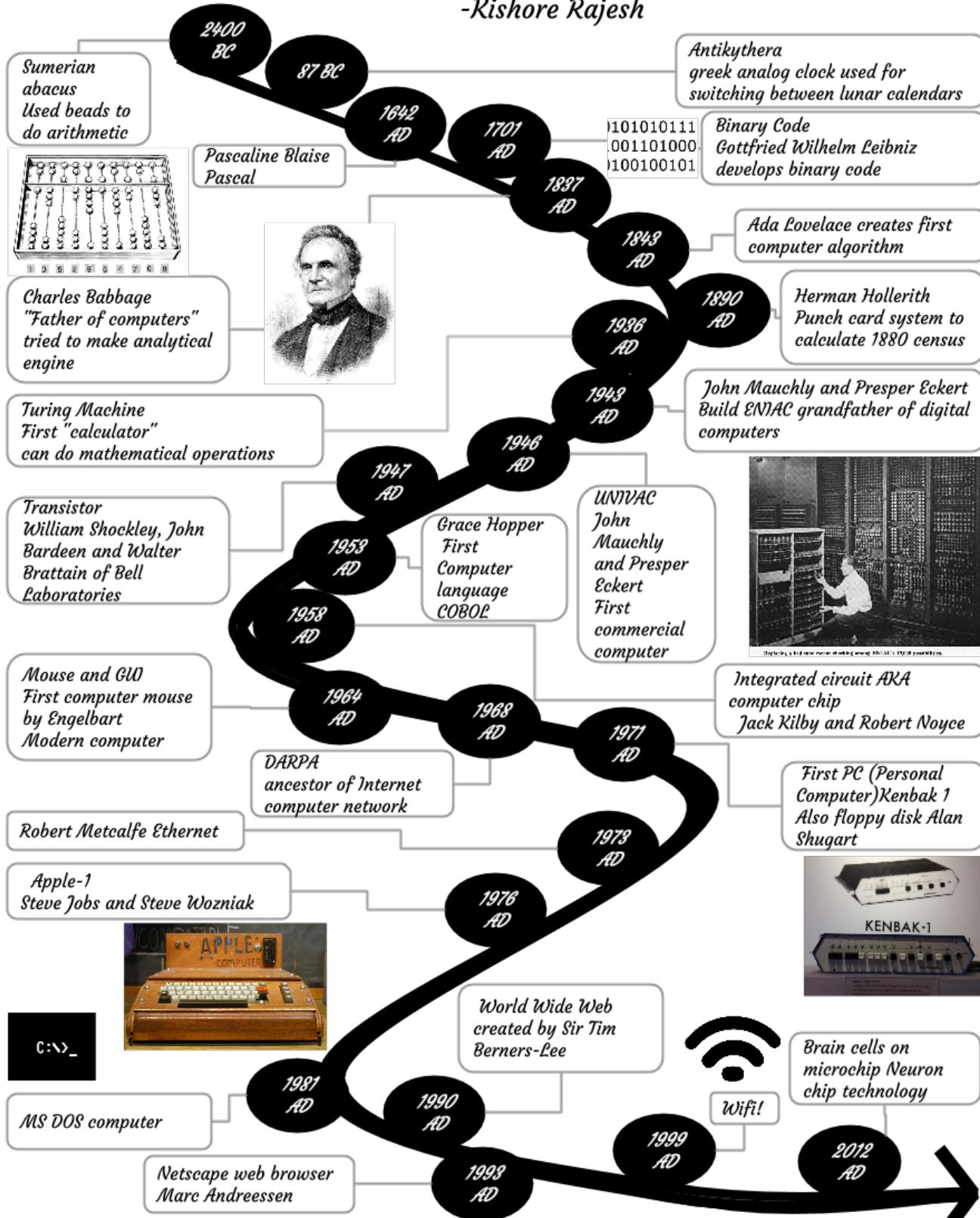
It's a Bird! It's a Plane! No, it's a Virtual Reality Simulator! (Page 7)

### Sunskruthi's Tech Shortcuts

1. If you just bought a new computer, then use the free application Ninite to quickly download all of your desired applications at once (Chrome, Skype, Steam, etc.)
2. If you accidentally close a tab, `ctrl+shift+t` will reopen it.
3. `Ctrl+Shift+Esc` to immediately open Task Manager, instead of using `Ctrl+Alt+Del`.
4. Go to your Microsoft Word-Preferences-Save and make sure it has been set to automatically save every 1 minute. Now, you will never lose all your work because you forgot to save.
5. `Ctrl B` to bold, `Ctrl A` to select all, `Ctrl L` to highlight, `Ctrl P` to print, and `Ctrl W` to close tab.
6. Use spacebar to scroll down a page and `shift+spacebar` to scroll back up.
7. You can cut a plastic cup and put each half over each speaker on laptop to amplify the sound.

# A Blast From The Past

-Kishore Rajesh



## Jerry Talks

Dear Jerry,

*I have been using the iPhone ever since the original came out. However, my relationship with Siri, the iOS personal assistant, has become strained lately. Whenever I ask her simple things such as "When should I do my homework, or "When will I get married?" she just gives me sass such as "What was that again?" or "Sorry, I missed that." It's obvious that she's becoming more and more distant from me. Any advice? I want my girl back!*

Desperate Doug

Hi Doug,

*Sometimes, life just doesn't go the way you want it to go. Our ice cream melts, our cars break down, our house catches on fire, our iOS A.I. doesn't behave the way we want it to behave. In my opinion, make up with Siri. Don't break up over such a trivial matter. Ask her more simple questions, for example "Can you call Fred?" or "Show me where the nearest gas station is." I hope this helps!*

Jerry

## Computer Science in Schools

Alonzo Arambulo

According to the US Bureau of Labor Statistics, by the year 2020, 1.4 million new computer science jobs will be available. This is due to the rapid acceleration of technology advances and integration into everyday life. Indeed, the future of computer science seems bright, as computer-related jobs are predicted by the Department of Labor to become some of the fastest-growing and highest-paying careers; however, the problem is most of those jobs will *continue* to be available. Sadly, only about 400,000 current professionals and college students will be able to fill those roles by that time, and some may not even be willing to. More than seventy percent of those jobs will have no one to do them. This is a big problem.

Peggy Heminitz, columnist for Emmaus Patch, writes a summary of a speech by Carlen Blackstone, an AP computer science teacher for 34 years who desperately wants people to see the importance his field has and will have in the near future. Blackstone says that "computer science is key to solving the world's most crucial problems", like poverty, economic resource allocation/sustainability, and national security, among other things. However, according to Blackstone, America's education system is virtually devoid of computer science.

In fact, as the role of computer science in the world is growing, its teaching in American schools has declined. According to Alison Miller, a writer for Edutopia, only ten percent of American schools even *offer* the AP Computer Science exam. At this current rate, there will be a very big labor shortage for the future computer jobs, all the while there are *job* shortages in other fields. The field of computers as a career is one of the most

underrated. Computer scientists earn an *average* of six figures. That's about as good as the other popular high-paying careers like law and medicine. Sadly, most people fail to see this, resulting in the seventy percent of future jobs not being taken.

One of the biggest problems people are attributing to the aforementioned disparity between the future workers and available jobs is the lack of diversity among computer scientists - almost ninety percent of them are White and Asian males. Compared to the country as a whole, these groups make up a meager thirty percent of the population, about two percent of those being Asian. If more people considered and had computer science available in their schools, maybe the disparity would not be so great.

Truly, to ensure that the future of computer science be as lucrative as it has the potential to be, the other ninety percent of schools that are restricting ninety percent of kids from learning the valuable information need to reevaluate their decisions. If computer science became available to most schools, not only would the ethnic and background diversity of computer scientists grow, but more people would take the high-paying jobs that lead to solving the nation's economic, social, and security problems. The future of computer science can and should be secured, but schools and children everywhere need to be more open-minded, willing, and able to teach and learn computer science.

## **The Bright Future of Computer Science**

*Archit Chopra*

Science Daily reports that the next generation of computers will be able to transmit information at the speed of light. That doesn't amount to much for the average human when told it directly, but further investigation leads one to realize that it means the death of the long despised loading screens. In the past year, many advancements in computers have come about with things like quantum computers, machines able to compute at the speed of light, only playing a small role in it.

Humans have generated 5 short tons of electronic waste in 2009 alone. Zhiyong Cai, a project leader at the U.S. Department of Agriculture Forest Products Laboratory, devised a computer chip that is composed entirely of wood, the implications of that are astronomical, potentially meaning that computers in the future will no longer be as environmentally harmful. Combined with the quantum computers, expect to be seeing environmentally friendly, buffer free laptops within a year. Another major contribution to the field of computer science is the infamous Microsoft Hololens. The Hololens opens up the door to augmented reality, which allows individuals to increase productivity or maximize laziness, depending on how you choose. A major misconception that is commonly observed, is the term virtual reality being used interchangeably with augmented reality, but there's a major difference between the two. Virtual reality is placing oneself within a reality that is constructed entirely by computers and such technology, augmented reality on the other hand is a reality in which technology and normal reality mixed. On the other hand, the alternative to Microsoft Hololens is Oculus Rift, which aims to let a normal human experience the thrill of virtual reality. These different advancements tie in a lot to how you will be able to interact with the technology around you.

Recently, large leaps have been made in the field of AI, allowing computers to slowly bridge the gap between humans and machine. As one might have heard, Google's appropriately dubbed Deep Dream software is a machine that is able to, in the most simple terms, dream. To a ordinary person, that might not mean much but a machine being able to do something that is normally associated as a unique characteristic of the human brain, is quite marvelous. Similarly, researchers from the Queen Mary University of London, have created a program which is able to recognize things which are drawn by humans better than the average person can. Meaning that this program is better than humans at recognizing things made by us, another feature which the human brain is known for that's being done by a machine.

Computer Science has always been a field which is accompanied by constant innovation. As a result, most of the advancements covered in this article were developed within the past month. In fact, the improvements discussed will most likely be replaced by more beneficial ones within a month's time. Simply put, this article is analogous to a drop of water in an ocean, and I encourage you to seek out more information on this topic.

## Teaching Tech With Mr. T

*Vignesh Sivakumar*

Computer Science: The programming essence of the present day and future; the vital source of software design; the brains behind the entire digital world. You get it, right? The rising demand for Computer Science personnel and engineers is boundless. Yet, unfortunately, studies show that students attending school nowadays aren't receiving enough of it. Let's have an insight from a familiar technologist we all know well enough. Who's the man who fixes all of the tech problems of Basis? Who's the man whose office is in a printer room? I'll give you a hint. He teaches morning AP Computer Science. You guessed right: it's Mr. David!



First off let's get a background of Mr. David and what he perceives in Computer Science. Being his first year teaching, Mr. David teaches an AP Computer Science class. In response to my questions, here were his responses:

"Approximately how many students seem to show interest or passion in the subject?"      *Mr. David chilling in his office*

Mr. David replied, "I would have to guess around all the students are interested in Computer Science, since it is a tool that all of us use."

As any Computer Science teacher would agree, Mr. David is familiar with the importance of the subject as it is crucial for the growing demand of programming and software design.

Mr. David's quote and opinion on why Computer Science is important for students to learn is, "It is important to learn Computer Science, because it is important to learn how a tool's basic function works, before using the tool. In the future, a student may create the next tool to that will help society."

Now onto the actual growing situation that on the fact that Computer Science is uncommonly found in national curriculum:

Having provided information in studies to Mr. David that Computer Science isn't being taught in many schools, his view on the matter is, "I would have to agree with the studies. There is a lot to learn about Computer Science. Each day, someone has written a program or an app to help everyone somehow. It is good to know how the process works and how much time it may take to write a program."

Basis Scottsdale, as it does include Computer Science in its curriculum, are one of the limited schools that provide students a course into programming and software design. As most of the other schools nationally don't implement Computer Science, I asked Mr. David what he thinks it takes for other schools to implement it in their learning agenda.

"It takes a lot of hard work and time to implement Computer Science. Computer Science is like combining a Logic class and an English class into one class. Everyone has his or her own writing style, but the concepts must be correct," was Mr. David's response.

The outlook for Computer Science is expanding further and further:

When asked to explain his opinion on the outlook of Computer Science versus the lack of it in school learning agendas, his reply was, "I would not say that there is a loss of Computer Science in school's teaching, but more of a large growth in interest Computer Science. We use computers every day and it would be beneficial for everyone to learn the basic concept of how the computers think and operate. If you are interested in Computer Science, then you should pursue it. It may be challenging at first, but with time and practice, it can be mastered, just like any other studies." You just heard Mr. David's insight to this situation. What do **you** think about it?

## **It's a Bird! It's a Plane! No, it's a Virtual Reality Simulator!**

*Jerry Miao*

Timmy Sullivan, a ninth grader, is currently working on a virtual reality project for the Intel Science and Engineering Fair at BASIS Scottsdale. I personally got a chance to interview him and ask a few questions about his fascinating project.

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**What is your overall goal for your project?**

In this project the goal was to be able to make a fully functional 3d virtual world. I was supplied the software and I bought the headset online from google. I used the unity engine to start with my world. I am given a baseline flat world and I am tasked with making both a detailed world with different AI with beautiful scenery. This is achieved by basically “building your world” with texture blocks that you can set on this flat plane. One of the major annoyances with using the unity engine is that there is no live fps monitor based on the specifications of the phone that you are using so every time I add some texture to your world or add an A.I. or NPC you have to check to see if that is ruining the smoothness of the world ( aka lagging). Once I create the world you must apply a “filter” layer to it. Its sort of like photoshop layers if you know how that works. This VR layer is supplied directly from google’s VR website. Once I apply this layer, I plug in my phone and the unity software and VR codec will sense it and automatically install a beta of the app I just made onto it. I then test it out to see if the world is glitching or if everything goes right. If there is a glitch in the system I just go back to the texture/ A.I. that is glitching and I try to troubleshoot the process. If all goes well then I am done and I have officially made an app!

**Could you provide some background information on what virtual reality is?**

Virtual reality is when you make a graphics engine run a stereoscopic and 3d simulation. Sensors in the headset itself sense and track your head movements to produce a realtime and interactive simulation by moving both the image and the sound. The virtual world you are experiencing in the headset adapts to what you do in the real world. If you tilt your head left, the virtual world you are in tilts left. If you hear a sound in your right ear and you turn 90 degrees to the right, you will hear the sound in front of you instead of on your right. It’s a more immersive experience when compared to standard forms of digital entertainment.

**What inspired you to conduct research on virtual reality?**

I have always been interested in virtual reality. Ever since I was a young kid, I had always imagined what virtual reality was like from all the sci-fi shows and futuristic movies, I just never had the resources to produce what I wanted to or do anything really because its such a new technology. Now in the present day, Google thinks that virtual reality is the future. They are now making simple cheap virtual reality headsets called “Google Cardboard” and giving out free guides and instructional videos on how to code for the headsets. Once I saw what google was doing, I immediately saved up to buy a copy of the Unity Engine and received a free Virtual reality headset with it, and that's how it all began.

**What would be your intended audience for the results of your project?**

Anyone really. When you mention virtual reality to anyone, they always have some sort of interest in it. I think by having this skill set that sometime in the future, I will either be able to present it to some

kind of corporation or just to have fun with it producing free little games for the public to use and have fun with.

**How long have you been working on this project?**

Its been my summer project, so since around the beginning of June. I have definitely learned a lot during this process, and am planning to learn even more.

**How have you been collecting your data?**

There isn't really data to collect. It's just learning how to use the unity engine with the virtual reality layer on top of it. It is like taking a class at school.

**How will your project benefit the future of virtual reality?**

Right now there are not a huge amount of developers jumping on the thought of virtual reality. I would help make the industry larger by giving the knowledge I learned to more and more people. We can then begin to code things that could save lives like surgery simulators, better flight simulators, and war simulators. I just want to make the world a better and safer place, and it seems like a stretch using virtual reality as a means of this, but I think it can happen.

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