

Crabby celebrates Black History Month



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Crabby Office Lady

February is Black History Month, and I've decided to mark it with an introduction to three of computer science's most illustrious pioneers.

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Whatever you may say about America (and during this campaign season, I have a feeling you have a lot to say about it) we are a whimsical nation. We throw parties for just about anything, and we also celebrate holidays to mark, well, just about anything:

- February is Senior Independence Month, and Spunky Old Broads Month. (Finally, something to love about February.)
- March is Chronic Fatigue Awareness Month, and Caffeine Awareness Month as well. (Tired or wired, this one's for you.)
- In November, people across this great nation of ours are marking Empty Nester Month and I Am So Thankful Month (obviously related).

Although I'm fairly certain I could wax poetical (even rapturous) about Caffeine Awareness, this week's column is devoted to something entirely more serious, Black History Month. And just as I highlighted women in the computer industry in [International Women's Day](#) (that's March), this column honors African Americans in the field of computer technology.

My research

In 1999 African Americans constituted just one quarter of one percent of computer scientists. (If you are a computer scientist, that's 0.25%.) Indeed, when I began researching African American pioneers in this field, I had a hard time finding a lot of people who'd been at the forefront. There are many contemporary experts in the field, yes; but this month is about history. And as I reached out to the community here at Microsoft, although I was inundated with dozens of names of illustrious African American inventors, mathematicians, aeronautical engineers, and professionals in other science-related industries, I wondered why there were so few in computer science.

But then I began to think about it, and I also began to read up on the people I'll be introducing to you today. And then it started to make more sense. Simply put, historically, the opportunities and education available to white Americans have not been so readily accessible to African Americans. However, exceptional talent wins through regardless, but that takes time, and computer science is still a young study.

But some people were too good to stop, too strong to become discouraged. Delving into the history of computer science and its pioneers, I continually ran across the same three names: fascinating and accomplished people, who've all made great strides in the field of computer science and its related technologies. By the advances they've achieved, they are African Americans ahead of their time.

Frankly, I think it's a crime that most of you will have never heard of these folks. This week, I make it my mission to change that.

Clarence A. (Skip) Ellis (1943-)

In 1969, Clarence Ellis was the first African American to receive a Ph.D. in Computer Science. Think about that: 1969. Microsoft wouldn't be founded for another six years and IBM wouldn't release its personal computer with Microsoft's 16-bit operating system, MS-DOS 1.0, for another six years after that. To say that Dr. Ellis was a pioneer in this field is an understatement.

I think it's germane that I tell you a bit about how Ellis came to computing. Apparently, it was somewhat by accident. (Right; are there really such things as accidents?) When Ellis was 15 years old, he had a part-time job at a Chicago insurance company as a security guard for the company's new and extremely large computer (in 1958 microcircuits had not yet been invented). Although he wasn't allowed to touch this computer, he had access to its operating manuals, and during his long hours guarding the computer, Ellis read all of them. So when crisis struck, when they ran out of punch cards to enter data into the computer (I told you this was history), only Ellis, because of his late-night reading, knew how to reuse the old cards. I'm guessing that a computer scientist was born right then and there, on the south side of Chicago.

After earning a Bachelor of Science degree in math and physics at Beloit College, Ellis pursued his interest in computer science in graduate school at the University of Illinois in Urbana-Champaign, where he earned his Ph.D.

And then he got really busy:

- He worked as a researcher and developer at AT&T Bell Telephone Laboratories. Here he helped create the idea of clicking on a graphic to launch a computer program or to issue a command, instead of typing line after line of computer code. (Sound familiar? Point and click?)
- He also worked at IBM, Xerox, Microelectronics and Computer Technology Corporation, Los Alamos Scientific Labs, and Argonne National Lab.
- He held academic positions at Stanford University, the University of Texas, Massachusetts Institute of Technology, and Stevens Institute of Technology.
- He has published several books and more than 100 technical papers and reports, lectured in more than a dozen countries, and been an invited speaker on object-oriented systems at the International Federation for Information Processing (IFIP) World Computer Conference.

Ellis was also very involved in the civil rights movement. In fact he was one of 250,000 people who, in 1963, heard Dr. Martin Luther King give his famous "I Have a Dream" speech in Washington, D.C. Of course I'm stunned by the array of Dr. Ellis's accomplishments — who wouldn't be? — but when I was researching him, what made the biggest impression on me was that he found a unique way to combine his love and understanding of computer science with his ardor for civil rights.

Remember when I mentioned how few African American have gone into the field of computer science? In addition to being a professor who is on the editorial boards of various journals and an advisor to numerous foundations, Ellis now also spends his time reaching out to minority students, encouraging them to explore a variety of career options. He teaches introductory classes and helped develop a summer program at the University of Colorado, called Summer Multicultural Access to Research Training (SMART), that provides internships in science and engineering.

So now there are more young people ready to grab that first chance. Their careers won't stretch from punch cards to graphical user interfaces, but they'll blaze trails of their own.

NOTE I have a soft spot for Professor Ellis in my heart because since 1992 he has taught at my Alma Mater, the University of Colorado at Boulder (go Buffs!). I hope to meet him one day (and pray he doesn't quiz me).

Mark Dean (1957-)

Another extraordinary African American working in the area of computer science is Mark Dean, a member of the Inventor Hall of Fame. In the early 1980s, Mark Dean and a colleague developed one of the pieces of internal architecture — called the ISA bus — that allows a computer to communicate with a printer and other devices. What's more, of the nine patents for IBM's revolutionary personal computer (PC) introduced in the 1980s, Dean is the holder of three. (This is no slouch ...)

Dr. Dean and a few of his accomplishments:

- In 1979 he got a job with IBM — a company he'd dreamed of working for.
- In 1982, he earned a master's degree in computer science from Florida Atlantic University.
- In 1992, after IBM sent Dean to Stanford University, he earned his Ph.D. there in electrical engineering.
- In 1995, Dr. Dean became an IBM fellow, one of only 50 in a company of more than 300,000 employees. He was also the first African American to be honored with this fellowship.
- In 1999, he became the director of IBM's Austin Research Lab. There he led his team in the development of the one-gigahertz (GHz) computer processor chip.

- In 2000 he was honored as one of the "50 Most Important African Americans in Technology" by the California African-American Museum. Other honors have included the Distinguished Engineer Award from the National Society of Black Engineers and the Black Engineer of the Year Award.

At IBM Dean is also involved in medical research, a project that attempts to mimic human biology with computer systems. The goal is to create "Blue Gene," which will be a descendant of "Deep Blue," the famous IBM computer that won a match against international chess champion Garry Kasparov. You know how that goes: one year your kid loves playing chess, a few years later, she's a doctor (yeah, my parents wished ...).

So, that modem or printer connected to your computer that you take for granted will just work? You can thank Dr. Dean. And that teeny tiny laptop that has a 3 GHz processor, the one that works faster than you can think? You can thank Mark Dean for that, too.

Philip Emeagwali (1954-)

Named as "a father of the Internet" by CNN, Nigerian-born Philip Emeagwali is a recipient of the esteemed Gordon Bell Prize for developing the fastest supercomputer software in the world. Setting out to compute the amount of oil in a simulated reservoir, he found a way to use more than 65,000 separate computer processors to perform 3.1 billion calculations per second (wrap your brain around that one). And the crux of this discovery was that Emeagwali had programmed each one of the 64,000 processors to talk to six others at the same time. It was computers communicating with computers (sound familiar?). And it was in 1987.

One of the most inspiring things about Emeagwali is how he got to where he is now: the roads he took, the struggles he dealt with.

- Born in 1954 to a large and very poor Nigerian family, by 1967 Emeagwali had to withdraw from school in his native Nigeria as his family hid in refugee camps during a civil war in which 50,000 of their people — the Igbo — were killed.
- At 14, he was drafted as a child soldier. The war ended six months later and he was reunited with his family. He took up his studies again but was forced to drop out because his family couldn't afford the school fees. However young Philip didn't give up; nor did his father, who spent hours each night quizzing his bright teenage son in math and other subjects. Emeagwali also spent much of his time at the library studying college-level math, physics, chemistry, and English.
- At 17, after that study earned him a diploma from the University of London, he received a scholarship from Oregon State University. Since then he has received a bachelor's degree in Mathematics, a master's in Environmental Engineering, and another master's in Ocean, Coastal, and Marine Engineering.
- Emeagwali has worked as a lecturer at both the Institute of Electrical and Electronics Engineers (the world's largest technical organization) and the Association for Computing Machinery (the world's oldest computer society); as a research fellow in the High Performance Computing program at the Army Research Laboratory; as a civil engineer at the United States Bureau of Reclamation; and as a distinguished lecturer at universities and institutes all over the world.

Philip Emeagwali said in a 2001 interview that his idea to use thousands of separate processors was born from a science fiction book he read. In this book, 64,000 mathematicians could forecast the weather for the entire earth. His peers initially rejected this vision of interconnected computers, saying it was impossible. Undiscouraged, Emeagwali forged ahead with his work and in 1987 had a breakthrough when an experimental computer at Los Alamos became available. Intended to simulate nuclear blasts, it contained 65,536 processors, but no one could program it. Emeagwali, fearful that the people at Los Alamos wouldn't accept his proposal to work with this machine if they knew of his African background, submitted his proposal from Michigan. He went on to remotely program the 65,536 processors in New Mexico while living in Michigan. After studying in Nigeria for a degree in London, it must have seemed almost next door.

As CNN said, "That feat led to computer scientists comprehending the capabilities of supercomputers and the practical applications of creating a system that allowed multiple computers to communicate." (I'm pretty certain that his "peers" who claimed it couldn't be done, ate a little crow that day, when Emeagwali gained the fame he had worked so hard to earn.)

Emeagwali's use of those thousands of processors to perform those 3.1 billions of calculations inspired:

- Apple Computer to use his multiprocessing technology to manufacture its dual-processor Power Mac G4.
- IBM to manufacture its \$134.4 million supercomputer, which had a peak speed of 3.1 *trillion* calculations per second.
- Every supercomputer manufacturer to incorporate thousands of processors in their machines.
- President Bill Clinton to call Philip Emeagwali "one of the great minds of the Information Age."

President Clinton also praised Emeagwali as a powerful role model for young people, using the phrase "another Emeagwali" to describe children with the potential to become computer geniuses. Fittingly, Emeagwali was named to the 2003 list of the 50 Most Important African Americans in Technology.

Now I want to do something

Maybe you do too, after reading the stories of these incredible computing pioneers. So what're you waiting for? Start thinking of ways to prevent global warming with a formula. Or maybe you'll make history by figuring out how to use brain waves to control your computer. If you get discouraged, go learn more about these three men ... and be inspired.

Read about how one former Microsoft employee and a partner are preparing underserved children of color for higher education and professional success: [Technology Access Foundation](#)

"A lot of kids growing up today aren't told that you can be whatever you want to be. There may be obstacles, but there are no limits." — Mark Dean

About the author

[Annik Stahl](#), the Crabby Office Lady columnist, takes all of your complaints, compliments, and knee-jerk reactions to heart. Therefore, she graciously asks that you let her know whether this column was useful to you — or not — by entering your feedback using the [Did this article help you?](#) feedback tool below. And remember: If you don't vote, you can't complain.

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