

The Birth, Spread, and Evolution of the Smiley Emoticon

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The :-) "smiley" and :-("frowny" emoticons are now very familiar to users of the Internet, Email, and social media. I first suggested that we use these character-based symbols for online communication in a message that I posted on a Carnegie Mellon University online "bboard" at 11:44am, September 19, 1982. At the time I was a young faculty member in CMU's School of Computer Science, doing research on AI.

The posting of this message is considered by many, including the [Guinness Book of World Records](#), to be the birth of "the digital emoticon", though the term "emoticon" was coined years later – I don't know by whom. This idea "went viral" long before "going viral" was a thing. This led to the development of many more text-based emoticons. And then in the 1990s (when the technology was ready to support it) the emoticon idea gave rise to the thousands of graphical emoji that are used today by people in every country of the world, as part of their daily lives. By most estimates, emoticons and emojis are now used several billion times every day.

I posted the [story of how the smiley was created](#) and its early history on my CMU home page in 2002, just in time for the 20th anniversary of the original smiley post. The 2002 post includes the [original discussion thread](#) of which my smiley post was a part. It also tells the story of how the original message was lost for many years, and then was retrieved by a sort of "archeological dig" through our ancient, barely readable backup tapes.

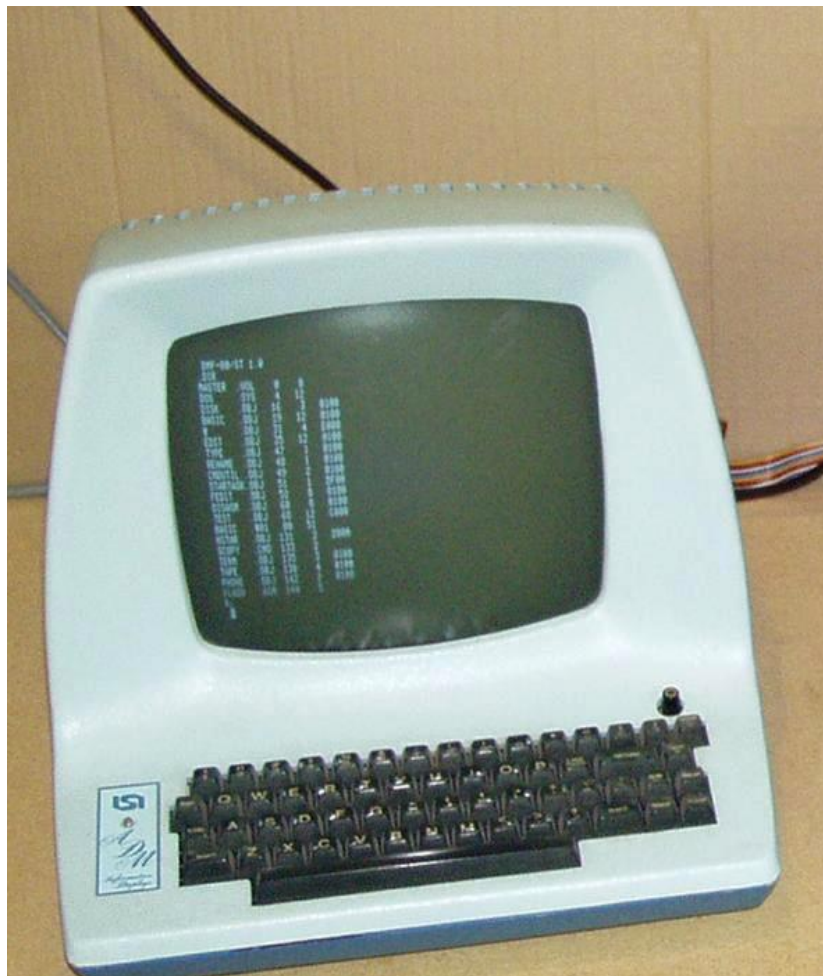
A lot has happened since 2002, and we perhaps have some new perspective on the meaning and importance of the emoticon/emoji phenomenon. So, with the 40th anniversary of the smiley post coming up next year, I thought it was time to update the smiley story – from my own point of view. Rather than alter my old 2002 account, which has become a sort of historical document in its own right, I thought it would be best to write this new, updated account.

Computing and Social Media, 1982

The world of computing and computer-based communications has changed almost beyond recognition since 1982. Younger readers may find it impossible to imagine how primitive our tools were in those days, so here is a quick sketch of our computing environments in 1982.

At that time, the Computer Science Department at Carnegie Mellon University was (and still is) one of the most advanced and best-equipped CS research labs in the world. While we were experimenting with personal computers, our day-to-day computing needs were met by two big time-shared computers – Decsystem 20s – each with 100 or more users, with maybe 20 people working (or playing) online at any given time. We also had a few smaller Vax machines and a collection of exotic experimental hardware. We used these machines for writing and running programs; writing proposals, reports, and the occasional book; and for communication among ourselves.

What we actually had in front of us were character-oriented display terminals, the most common being the ADM-3A pictured here:



These terminals could display alphanumeric characters, 24 rows by 80 columns. The selection of characters was limited to the 7-bit ASCII character set: upper and lower-case English characters (none of those funny foreign accent marks, let alone characters from foreign alphabets), digits 0-9, and a modest selection of punctuation characters. CS faculty members typically had one such terminal in our office and one at home. The home machines talked to the CMU time-sharing systems via a telephone line, using an acoustic modem (the ones that made whistling noises) that moved information at, typically, 1200 bits (about 150 characters) per second. If there was noise on the phone lines, transmission was slower, and the characters appeared on your screen as if there was a novice, one-finger typist on the other end. For comparison, my current home Internet connection is about a million times faster.

The grad students were generally not given home terminals or dedicated phone lines, so most of them worked on their projects in large "terminal rooms" with many of these character-based terminals. This was not ideal for getting work done, but, on the plus side, a lot of camaraderie developed among the students, and a lot of mutual tech support was available if needed.

All of the machines in our department were connected to one another by Ethernet, so it was easy to transfer files and send text messages from one machine on campus to another. Files were backed up to magnetic tape on a regular basis, and the older tapes were stored in an off-site warehouse.

By 1982, CMU was one of about twenty U.S. universities and corporate research labs connected to one another by the experimental, military-run ARPAnet, the precursor to today's Internet. So it had just recently become possible for us to send Email messages to friends at MIT, Stanford, Xerox PARC, and a few other places.

Of course, as soon as we could send text messages to one another, a primitive form of social networking appeared, in the form of online "bulletin boards" or "bboards". Basically, instead of sending an Email message to an individual recipient, you could send it to a bboard, and anyone in our community who chose to could see it there. There were bboards for different topics: talk announcements, lost and found, various clubs and interest groups, and one called "general" where the rule was that "anything goes". This was kind of like Facebook and Twitter today, except that it was only text – no photos or videos, no sound recordings, and no easily clicked links to other sites. (Also no spam and advertising, though these would appear soon enough).

And, as soon as we had social media, even in this primitive form, "flame wars" started to break out. Mostly these were caused by misunderstandings: In our community of science nerds, sarcastic humor was very common. So someone would post a humorous message, not intended to be taken seriously. Of the many people who saw that message, someone would not get the joke, and would take offense. That person would post an angry response. Others would jump on them. And the flaming messages would rage on long after the original topic had been forgotten.

(In fairness, we had faculty and students from many countries and many cultures, so such misunderstandings were more frequent in our community.)

The Birth of the Smiley

You can see one example of a (rather mild) flame war in the [original discussion thread](#) that led to the smiley message. We had been discussing what would happen if the cable on one of our elevators snapped, and the elevator went into free-fall. We had talked about whether a bird would become disoriented and would fly upside down, whether a candle would go out with no gravity to feed the convection currents, and what would happen to a puddle of mercury on the floor of the elevator.

Howard Gayle – I believe he was a CS grad student at the time – then posted a sarcastic safety warning: "Because of a recent physics experiment, the leftmost elevator has been contaminated with mercury. There is also some slight fire damage. Decontamination should be complete by 08:00 Friday."

One member of our technical staff scolded him for posting a fake warning that someone might believe was real, and the flaming took off from there. There followed a lengthy discussion about whether there might be a simple way to mark "joke" messages – ones that were not to be taken seriously. Perhaps we could put an asterisk in the subject line of the message. But that was unsatisfying: the meaning of this symbol wasn't at all obvious. An asterisk in that position could mean anything at all.

Several of us tried to come up with something better, but it had to use only the limited ASCII character set that was available on our keyboards and terminals, and it had to fit in the single-line subject field of the message – no complicated 2-D "typewriter art" using characters as pixels.

It occurred to me that the most intuitive way to signal "I'm just kidding" would be to create some sort of smiling face, like the ones we used to see on T-shirts and balloons back in the 1960s. But how could we possibly do that in a single line of characters?

I looked at every character on the keyboard, hoping for some inspiration. The most important element of a face is the eyes. In a German character set, we might have umlauts, such as **ü**, but there was nothing like that in ASCII. There was, of course, the colon character – too bad it was the wrong way round... But – Aha! – maybe we could make a sideways smiling face that people would recognize. We might have to tell people to turn their heads sideways to see it...

And so, I posted this message:

```
19-Sep-82 11:44    Scott E  Fahlman          :-)  
From: Scott E  Fahlman <Fahlman at Cmu-20c>  
  
I propose that the following character sequence for joke markers:  
  
:-)  
  
Read it sideways.  Actually, it is probably more economical to mark  
things that are NOT jokes, given current trends.  For this, use  
  
:-(  

```

It took me maybe ten minutes to come up with this idea and to post the message. At the time, I thought that this was a fairly clever solution to the problem we were discussing, but nothing really special. Perhaps it would amuse the dozen or so people participating in this discussion, and perhaps some of us would occasionally use these symbols. As you can see, I didn't carefully proof-read the post, and in composing it I had dropped a couple of words in the first sentence.

And, at the time, I didn't keep a copy of the message, online or in printed form. In those days we didn't have a lot of disk storage available, so bboard posts like this were kept around for a while, but were dropped when storage on our big machines got tight. Who would have dreamed that a silly message like this would be the start of something big and long-lasting, and that years later we would want to retrieve the original message. Fortunately, there were backup tapes.

And Then It Spread...

At this point, something strange and unexpected occurred: the idea of using these two symbols for "joking" and "serious" started to spread through all the machines on the CMU network. People who had not been part of that bboard discussion saw these symbols and started to use them in their own messages. The :-) symbol quickly took on the added meaning of "I'm happy about something" and the :-(symbol added the meaning of "I'm sad". Within a week, these symbols could be seen in a large fraction of the non-serious-business messages among the CS people at Carnegie Mellon.

Some CMU alumni, now at other labs and universities, would occasionally use the new-fangled ARPAnet to exchange mail with their friends still at CMU, and sometimes to browse our bboards. And we could look at theirs. Via this connection, we could see that, within a couple of months, the smiley and frowny symbols had made their way to most of the other universities and labs on the ARPAnet, and they were being commonly used in those communities as well.

In November we received the following message from Jim Morris, a CMU alum who was now a researcher at the famous Xerox PARC lab in Palo Alto. (Jim would later return to CMU where he became Dean of the School of Computer Science.)

Date: 10 November 1982 1126-EST (Wednesday)
From: James.Morris at CMU-10A
To: csl^ at PARC-MAXC, isl^ at PARC-MAXC, junk^ at PARC-MAXC
Subject: Communications Breakthrough

Because you can't see the person who is sending you electronic mail you are sometimes uncertain whether they are serious or joking. Recently, Scott Fahlman at CMU devised a scheme for annotating one's messages to overcome this problem. If you turn your head sideways to look at the three characters :-) they look sort of like a smiling face. Thus, if someone sends you a message that says "Have you stopped beating your wife?:-)" you know they are joking. If they say "I need to talk to you :-(", be prepared for trouble.

Since Scott's original proposal, many further symbols have been proposed here:

(:-) for messages dealing with bicycle helmets
@= for messages dealing with nuclear war
<:-) for dumb questions
oo for somebody's head-lights are on messages
o>-<|= for messages of interest to women
~= a candle, to annotate flaming messages

So you see, bit-map displays are really quite unnecessary :->

So not only had the smiley idea "gone viral" (as we would say today) and spread to many other machines, but it had also started to mutate into new forms – most of them still sideways. But once this idea had spread to all the universities and labs on the ARPAnet, it could go no further. Like Alexander the Great, Smiley had reached the end of the known world (or at least the *connected* world). There were no more worlds to conquer.

I was surprised and pleased by the speed at which this idea had spread, and the fun that people were having with it. But I still thought that, within a month or two, in this small, closed community, the novelty would wear off, and this would all be forgotten.

But I was wrong. As it happened, the timing of the smiley message was perfect: That same year the small, closed, military-run ARPAnet was turned over to civilian control (administered by the National Science Foundation in the U.S.) and could be joined by any university or company research lab that had installed the proper hardware and software. Over the next few years, the growth of connected sites on the Internet was explosive.

As each new organization joined the fast-growing Internet, they would start to receive Email messages from the existing sites. Some of those messages contained the smiley and frowny symbols, and an ever-growing number of other emoticons. It seemed that wherever these

messages arrived, the emoticons took root, and soon the locals were using them in messages among themselves.

Network connections soon were established to universities and research labs in the UK, continental Europe, and Japan. Within a decade, computer scientists in every developed country could send messages and exchange files with friends and colleagues in any other country. And, of course, the use of emoticons spread to all of these countries as well. It helped that the emoticons were universal – easily recognizable and not tied to any single national language – though at the start they were still tied to the ASCII (English language) character set.

From our vantage point at CMU, one of the oldest and largest sites on the Internet, we could watch how the smiley and idea of text-based emoticons spread out from my short, informal message on a local bboard to every part of the world. That was fun. But until the mid-1990s, all of this communication was confined to computer scientists, programmers, and people in other computer-using fields. There was really no reason for non-specialists to have computers in their homes.

This all changed in the early 1990's. The earlier networks supported text-only Email and some "newsgroups" for various topics, but finding and transferring other kinds of information was awkward, slow, and confusing. There were a number of competing file formats, transfer protocols, and software applications used by different communities.

Several people proposed solutions to this, but Tim Berners-Lee, then at CERN, proposed an integrated solution that won the day. He developed a set of formatting conventions for multi-media "web pages" with photos, sound, and videos. This evolved into what we now call "HTML". And along with that he built the first "web browser" that could display these web pages, allowing users to move from one page to another via "hyperlinks".

This collection of ideas formed the basis for the Worldwide Web, pretty much as we know it today. This became available to the general public in 1991. Within a few years there were millions of people on the web, and millions of web pages. At the same time, personal home computers with graphic displays were becoming affordable, as were "webcams", microphones, and headsets. Suddenly, people realized that there was some reason to have a computer in their home for non-business use: They could look up movie times, restaurant menus, and encyclopedia entries. They could send Email messages to distant friends and family members. They could take digital photos and save them for later viewing. And soon after that, new forms of social media were appearing, in place of the old bboards and newsgroups. This technology was reasonably affordable, and the price kept dropping.

And as soon as the Worldwide Web and Email burst into people's living rooms, the emoticons burst in as well. Most of the public had never seen these things, but they immediately understood what they meant. For those of us who had been using emoticons for two decades, it was amusing to see the excitement they caused when new users first discovered them. People

started using too many smileys and other emoticons as a signal to their friends that they now knew the secret language of the Internet – not realizing that putting six emoticons in the same sentence marked them clearly as "newbies". It was very similar to what happens when people first get access to multiple fonts and multiple colors for their text documents: they go nuts for a while, creating super-busy documents with way too many colors and fonts – usually hideous and distracting – and then most of them eventually settle down and use these tools to good effect.

So finally the smiley and other emoticons had conquered the "real world" as well as the "computer nerd world".

Mutations

As the emoticons spread, step by step, around the world, they began to mutate into new forms. We saw some of the first instances of that in Jim Morris's message quoted earlier. Once the idea was unleashed, people started having a lot of fun inventing new versions of increasing complexity. Some people published whole books of emoticons. I should make clear that my own contribution to all this was limited to the two emoticons in my original message, though I wish I had also invented the "winky" ;-) which I use pretty often.

Among the first emoticon variants to appear were the "noseless" smiley :) and frowny :(, which are now used more frequently than the originals. I don't really like these – to me they look like frog faces, not human faces. My students know that they might be scolded (in a good-natured way) if they send me Email with these things included. But I can see why people use them: if you are typing messages with your thumbs on a nasty little cell-phone keyboard, it's a lot easier to type two characters than three, especially if they are off on the punctuation page.

And after that people got really creative. Here is a sample:

: -P *<: -) # = | : - (# + < : -) : - O % - O > " ^ ^ ^ ^ ^ ^ -

These are, of course, "sticking out your tongue at someone or blowing raspberries", "Santa, with hat and beard", "Abraham Lincoln", "the Pope", "someone screaming, as in Edvard Munch's famous painting", "Picasso's version of the same", and "a crocodile coming to eat all the others".

Some of these are not very useful for everyday communication. For many of these complex emoticons you have to be told what they represent, and *then* you can see it (maybe). Also, I sometimes go for several days without needing to mention crocodiles in Email or online posts, so they are needed much less frequently than :-) or :- (or ; -) .

Another branch of the emoticon tree is the East Asian style (mostly Japan and Korea).

(^ _ ^) d (^ _ ^) b (T _ T)

They solved the problem I could not, in figuring out a way to make an upright face from ASCII characters. These are "happy or peaceful face", "person with headphones or earrings", and "person crying". Now that most of us have access to foreign character sets, thanks to the Unicode consortium, we can do some emoticons much better than when we were limited to ASCII. For example, the "shruggie" emoticon is now quite popular:

-_(\ツ)/-

But by the year 2000, the technology available to regular people was finally ready to support the next revolution: the arrival of the graphical emojis. These were inspired in part by the earlier text-based emoticons, but have now largely replaced them. Shigetaka Kurita, then working for the Japanese mobile phone company NTT DoCoMo, created a set of 176 emojis to be used on that company's products. Initially these were small 12x12 pixel images, with a single bright color on each. These cartoon-like pictograms quickly became popular, and inspired other companies to produce their own emoji sets.

Things were quite chaotic for a while: I would send you a phone message with a picture of a smiling face; you, on a different brand of phone, might see that as a pile of poop. Or a crocodile. Finally the companies turned the task of standardizing an official set of emojis over to the Unicode Consortium, whose charter up to that point had been to standardize the computer codes for all the alphabets and character sets used in the world. It's an awkward situation: this bureaucratic standards organization is now faced with politically charged tasks such as deciding how many different skin tones and genders must be available in pictures of Chefs or Fire Fighters. But it works. As I mentioned earlier, emojis are now used all over the world, in mostly-compatible ways, many billions of times per day.

During an interview about the smiley, I mentioned that I don't really like the graphical emoji, don't use them myself, and much prefer the character-based emoticons. I think that the yellow circle faces are mostly ugly, and lack both the creativity and the sense of whimsy of the emoticons. But perhaps I'm a bit biased, since I helped to create the character-based ones, and have been living with them for a very long time.

The press got hold of that comment and tried to portray it as a passionate hatred: "Smiley Emoticon Creator Hates Emoji! Wants To Get Rid Of Them!" Don't believe everything you read in the papers – or online. If other people enjoy emojis, I'm fine with that. But I do resent it when commercial software turns my nice :-) symbols into 😊 without my permission.

Why Did The :-) Go Viral And Last For Decades?

In 2014 I was invited to give a keynote talk at the World Communications Forum in Davos, Switzerland. This was an annual meeting of communications professionals: people in PR, advertising, spokespeople for government agencies, and so on. A lot of these people work on

creating and managing international "brands" for companies. They wanted me to explain my "secret": how I had (accidentally) created a "brand" (the smiley) that was used and often loved by people all over the world – a brand that at that time had survived for 30+ years and was still going strong? And all without any budget to promote the thing?

So I thought about this for a while, and there really was no secret. At this point, we are all familiar with silly photos, videos, songs, and memes that "go viral" on the Internet. But the smiley and the whole idea of emoticons was perhaps the first thing that ever went viral in this way -- the very year that the civilian Internet was created!

There are perhaps some lessons to be learned here, and these are what I shared in my talk:

- **The :-) and :-(emoticons filled a (small) need.** They provided a *very easy* way to say “I’m only joking”, “I’m happy”, “I’m serious”, or “I’m unhappy”. No special codes or pull-down menus – you just type them.
- **They are free to use.** If people had to pay to use these or get my permission or buy a subscription, nobody would ever have used them.
- **There's an "in group" effect:** Hey, look, I know the secret language of the Internet!
- **Smiles are universal.** A smile is immediately recognized by people in every human culture, across every language. So is a frown. We don't know of any human culture in which people turn their mouths down when they are happy and up when they are sad.
- **The :-) emoticon is the distilled, abstract essence of a smile.** It has no gender, no race, no age, no religion, no politics... It's just a smile. This is a big advantage over the emoji versions. With :-) we don't have to argue about how many different versions we have to create for different groups. It looks like all of us.
- **Smiles are positive, powerful, and contagious.** If you pass someone on the street and smile at them, you both feel a little bit happier, and maybe have a better day.

So perhaps it is not so mysterious that these particular emoticons traveled so far and lasted so long. In any case, the talk was a success, I was invited back to the conference several times, and I made a lot of friends there. (Some of my subsequent talks were about the future of AI and the interaction of technology and society – topics closer to what I actually work on.)

How Has The :-) Invention Changed My Life?

This invention has led to a number of adventures – things that I certainly wouldn't have experienced otherwise. Here are a few high points:

- Carnegie Mellon's PR people love this story, and so do the students. CMU has a reputation in some quarters as an excellent school, but one where people work too hard and never have

any fun. So this is a little bit of proof that we do occasionally have fun and do things that are both weird and silly.

Every year on "Smiley Day" (September 19) we have a big meet-and-greet celebration on campus, at which we pass out Smiley souvenirs, cookies, and T-shirts. I get to meet a lot of the undergrads, sign a lot of T-shirts, and pose for hundreds of selfies. Exhausting, but fun!

The new students are always amazed to learn that:

- Someone actually had to invent the :-) and :-(emoticons. They were not handed down from antiquity.
 - We know who that person is.
 - It happened on the CMU campus, done by a CMU professor of Computer Science.
 - He's still alive! Really!
 - He's standing here signing T-shirts and taking selfies with students.
- In December of 2010 I was contacted by the editors of L'Uomo Vogue, the Italian men's edition of Vogue magazine. They wanted to photograph me, as the inventor of the emoticon, for their January 2011 edition. To anyone who knows me, this is a hilarious concept – I am perhaps the least fashion-conscious person I know. I explained this to them, and they still wanted to do the photo session. So they arranged to have one of their photographers, Bjorn Iooss, fly to Pittsburgh to photograph me in my office and around the CMU campus.

They offered to send a stylist and, if I sent them my measurements, some nice Armani suits and things – I think just for the shoot, not to keep. Or I could just wear my own clothes if that would be more comfortable. I chose that option.

As it happened, this took place on one of the coldest winter days in Pittsburgh history. So I put on slightly-nicer-than-normal clothes, and also put on a leather bomber jacket that I had bought used, in an antique mall, for \$25. It was the warmest thing I owned.

Bjorn took a bunch of shots of me around the office and at the computer. At the end, he asked if I had any ideas. I suggested that I could put on the bomber jacket and go stand on the balcony of our CS building, with the frozen Pittsburgh sky in the background. He liked the idea, took a few shots there, and one of them was the picture they used – full page! I looked like an Antarctic explorer, just rescued from the ice floes.



Of course, once my colleagues heard about this, it was the occasion for much hilarity. They all started asking me for fashion advice, so I told them that leather bomber jackets are going to be very big this year. A few days later I talked to one of the editors at Vogue, and I happened to mention these conversations to her. She said, "That's very funny. We just had a meeting and decided that bomber jackets *are* going to be very big this year."

- In part because of the Davos talks, I've been invited to a number of other interesting places to talk about Smiley and sometimes also about AI. The most memorable one was an invitation in 2016 to speak at a tech-festival put on by the Italian edition of Wired Magazine. The talk was in the Palazzo Vecchio in Florence, and my wife got to come as well.

It was a truly surreal experience to be standing in the Salone dei Cinquecento, surrounded by masterpieces of Renaissance sculpture, painting, and fresco, and to be giving a talk to several hundred people about what is possibly the nerdiest thing ever invented. It felt like a strange dream, but it really happened. The video is [here](#).

It's strange that ten minutes spent writing a silly message, almost 40 years ago, has turned into the thing that I'm best known for. Given a choice, I would rather be famous for my accomplishments in AI research. But it's fun to be a little bit famous for *something*. And it certainly has been a fun ride.