Claude Shannon Was A Genius On Par With Einstein And Turing. Why Isn't He As Famous?

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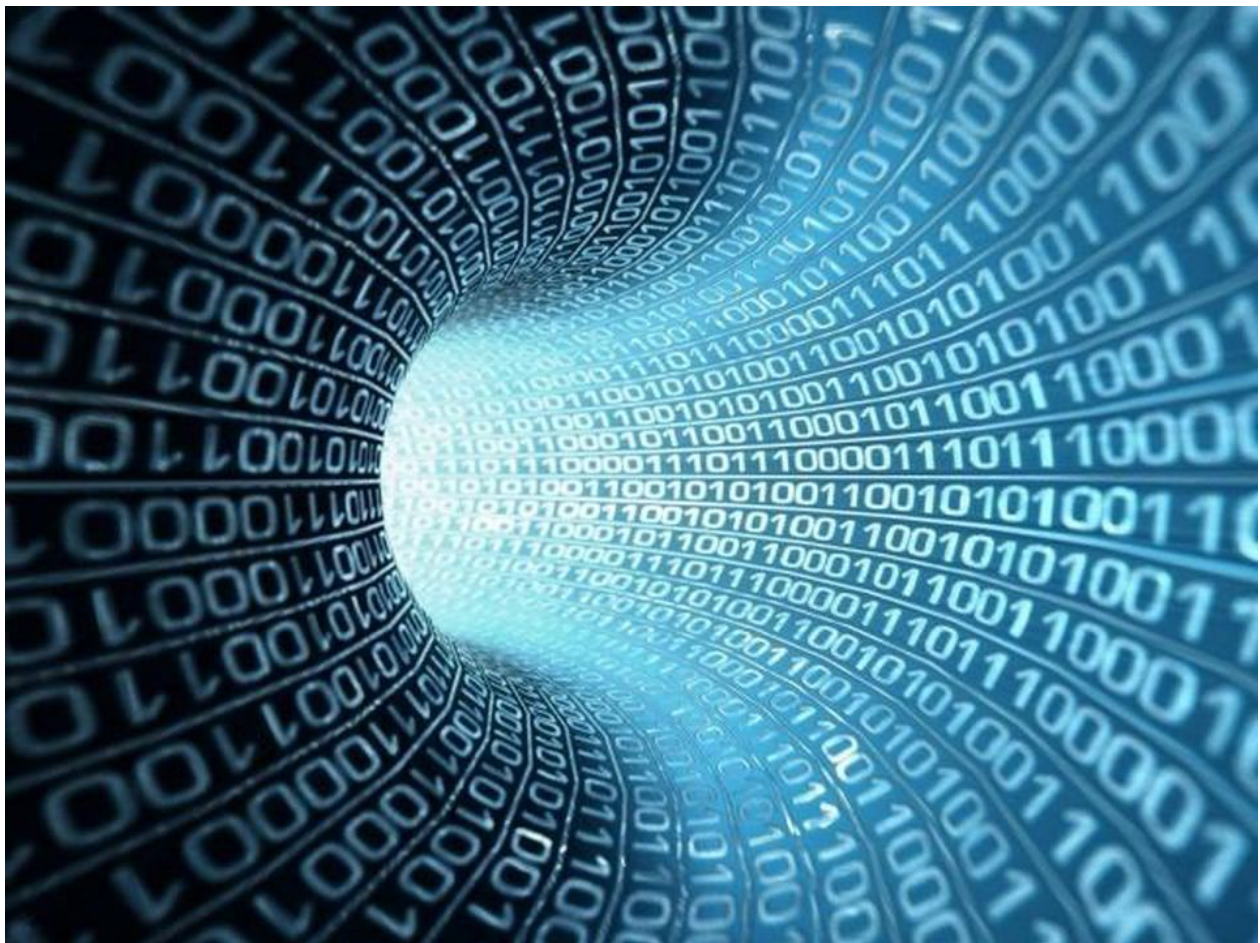
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Why is Claude Shannon so underappreciated compared to other great thinkers of his day like Turing and Einstein? originally appeared on *Quora:* the place to gain and share knowledge, empowering people to learn from others and better understand the world.

Answer by **Rob Goodman**, co-author of *A Mind at Play: How Claude Shannon Invented the Information Age*, on **Quora**:

Why is Claude Shannon so underappreciated compared to other great thinkers of his day like Turing and Einstein? Short answer: because that's how he wanted it.

Shannon certainly earned comparisons to the likes of Turing and Einstein during his lifetime. As the science writer William Poundstone put it, "There were many at Bell Labs and MIT who compared Shannon's insight to Einstein's. Others found that comparison unfair—unfair to Shannon." And when Shannon made a surprise appearance at an information theory conference in 1985, the conference chairman reflected, "It was as if Newton had showed up at a physics conference."

Those comparisons aren't terribly far fetched. Shannon laid the foundation of digital computing, invented the *bit*, and showed how digital codes could allow us to compress information and send it flawlessly. These contributions make up the intellectual architecture of the internet and the digital age. But there are a few reasons why they didn't make Shannon a household name.

1. He dropped the mic.

Probably the most important one is that Shannon consciously stepped away from fame. After the publication of his landmark information theory paper in 1948, he did experience a brief period of notoriety, with spreads in national publications, and a role in some Bell Labs promotional videos. Yet, at the height of that brief fame, when his information theory had become the buzz-phrase to explain everything from geology to politics to music, Shannon published a four-paragraph article kindly urging the rest of the world to vacate his "bandwagon".

As he put it, "[Information theory] has perhaps been ballooned to an importance beyond its actual accomplishments. Our fellow scientists in many different fields, attracted by the fanfare and by the new avenues opened to scientific analysis, are using these ideas in their own problems. In short, information theory is currently partaking of a somewhat heady drought of general popularity."

In place of that popularity, which he admitted could feel "pleasant and exciting," he advised his fellow engineers and mathematicians to focus on research. "The subject of information theory has certainly been sold, if not oversold. We should now turn our attention to the business of research and development at the highest scientific plane we can maintain," he said. It wasn't because he wanted the turf for himself. For Shannon, useful, informed applications of information theory were always welcome. But there was real danger that the ideas he had set in motion might become stretched beyond their meaning.

In other words, Shannon was, at heart, a working engineer, and he was uncomfortable making the leap to professional pontificator, public intellectual, or scientific oracle that might have secured him more lasting fame. Those options simply didn't interest him: he preferred to spend his time tinkering in his two-story workshop, inventing new gadgets (like a fleet of customized unicycles or a flame-throwing trumpet), and studying the mathematics of juggling.

2. You can't hold a bit.

If Shannon's allergy to publicity is one reason he's underappreciated today, another may be that his contributions to the history of computing and information are relatively intangible. Compare him to Turing: even though Turing's theoretical contributions are remarkable in their own right, he's also closely associated with big, photogenic hardware, like the codebreaking computer you can see in *The Imitation Game*. Shannon was a hands-on engineer, and he put together plenty of fascinating hardware in his own right—like the gadgets mentioned above, or Theseus, his "artificially intelligent" maze-solving robot mouse—but they were all a bit tangential to his most seminal intellectual contributions.

In other words, it's easy to picture a computer, but harder to picture the creative leap that proved switches or circuits could evaluate logical statements. It's easy to picture a smartphone, but harder to picture the insights into the nature of information and communication that made that smartphone possible. Shannon worked at that foundational, intangible level—which is why he's revered among experts, but somewhat invisible to the general public.

3. He wasn't tragic enough.

We expect our greatest minds to bear the deepest scars; we prefer our geniuses tortured. But with the exception of a few years in his twenties when Shannon passed through what seems like a moody, possibly even depressive, stage, his life and work seemed to be one continuous game. He was, at once, abnormally brilliant and normally human. Nor, like Turing, was he persecuted by his own government.

Perhaps the greatest tragic irony in Shannon's life is that Alzheimer's disease took away his mind just as the information age he made possible began coming into full flower in the 1990s. It was deeply painful, of course, for those who were close to him. But dying of Alzheimer's wasn't especially abnormal, either. For the most part, Shannon lived a happy, successful, and fortunate life.

The "trouble" with that, of course, is that it doesn't necessarily lend itself to a tidy narrative of 'genius overcoming the odds', especially given our culture's preconceptions about genius. What we take from Shannon's story is a reminder that creatively fruitful lives can also be joyful ones.

And there's no better memorial to Shannon than the one he planned himself: later in life, but still in a lucid moment, he sketched out a memorial parade for himself featuring a jazz combo, unicycling pallbearers, juggling machines, a "chess float" atop which a human grandmaster squared off against a computer in a live match, a phalanx of joggers, and a 417-instrument marching band.

The procession never took place, of course. But it tells us a great deal about the person who planned it.

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