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Future of Data Storage- DNA Data Storage

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Description

We as humans are producing a lot more data than we can store today. If we want to put a dent on a problem, we need a radical solution to it. Each miniature in 2018, Google conducted 3.88 million looks, and individuals observed 4.33 million recordings on YouTube, sent 159,362,760 e-mails, tweeted 473,000 times and posted 49,000 photographs on Instagram, agreeing to program company Domo. By 2020 an assessed 1.7 megabytes of information will be made per moment per individual all-inclusive, which deciphers to around 418 zettabytes in a single year (418 billion one-terabyte difficult drive's worth of data), expecting a world populace of 7.8 billion. The attractive or optical data-storage frameworks that right now hold this volume of zeros and ones ordinarily cannot last for more than a century. Additionally, running information centers need huge amount of energy. In brief, we are almost to have a genuine data-storage issue that will as it were ended up more serious over time Now imagine storing chunks of data in the size of jellybean weighing about three grams which means in three grams of DNA we can pack 600 million gigabytes of data.

We are the result of the three-dimensional computer program written in a tiny compound. It's set of instructions coded and saved that our bodies write and read to build proteins, construct cells and perform thousands of our tasks. Genetic engineering is fundamentally attempting to hack our own hard drives, and we are becoming familiar with the potential outcomes of achieving this consistently. Back in 1964, a Soviet physicist called Mikhail Neiman concocted the concept that we might use the lightweight, powerful DNA storage device to store not the code of nature but what we needed. So far, we have been capable to decipher parts of nature's programming gene here and a few lines of code there. We are extremely close to putting all our files and pictures we want into DNA storage. I know it sounds crazy, and it is. But it is possible.

In 2013, scientists proved they could write computer data into synthetic DNA with 0 errors! First: Teaching computer to speak DNA - machine language is binary zeros and ones, while DNA is A, T, G, and C. This conversion from binary to DNA code happened using algorithms DNA only pairs with A, T, G and C, and these letters can also be reversed like AT and TA are different which means data is denser; there's the algorithm provides all the translation for them. Then the piece of DNA is created reflecting computer data.

It's the same DNA that we find in your cells, but they made it in the lab. To obtain data back of the DNA scientist would sequence it just like they would with any other piece of DNA that showed up in a lab.

One of the reasons for using DNA storage is its density, order of magnitude higher than anything that exists today. Its reliability, resiliency and then it has relevancy. We think that as long as humans are alive, we will care about reading our own DNA and that means that we'll have a storage format that will be with us that will always be relevant. Two main reasons for using DNA data storage First, nucleic acids are very dense: the information contained in a million-terabyte-scale data center, encoded in DNA, could fit into a shoebox. Second, when stored in appropriate conditions, DNA is durable, cheap and can last thousands of years in a cold dry place without leveraging energy. Microsoft is already using DNA storage for several years now and been working to make it automatic to make it useable because so far it has been manual. And it is possible to make the entire process automated from bits to molecules and back to bits. Companies like Craver is also using DNA to store Bit coin passwords into a drop of liquid which will give access to a crypto currency wallet. Several companies providing DNA data storage services like Catalog, Evonetix, Molecular Assemblies and many more.

I do not think DNA data storage will replace disk drives or RAM anytime soon, because even with amazing writing and reading speeds, it will be impossible to compete with the speed of technologies currently in use. However, it could represent a great way to back up our data centers in a sustainable way and store the massive amounts of data that do not require immediate access. If DNA data storage becomes a reality, a whole lot, more exciting things should emerge as well. It is going to remain an exciting time for me to live in.