

## NANOBOTS - Small Solution to Big Problems

Imagine a swarm of microscopic robots, so tiny, that a teaspoon can hold billions of them. We're at a stage in medical advancement where robots are tiny enough to enter the human body and deliver care.

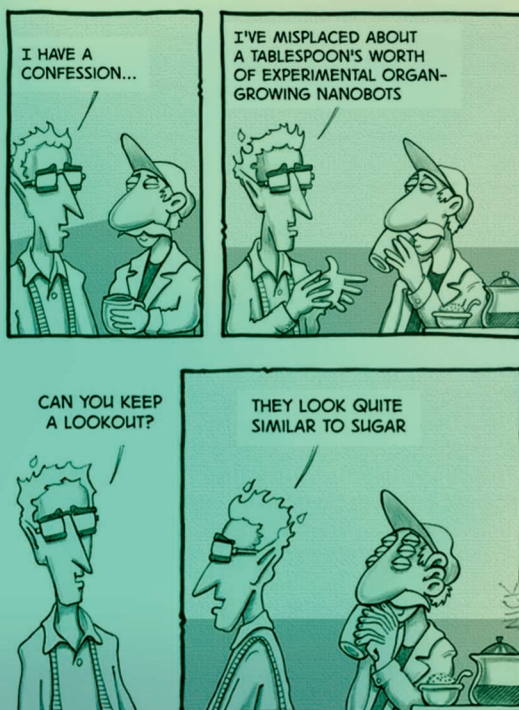
These microscopic robots are ready to be injected into the most delicate areas of a human body - the heart and the brain - to deliver drugs with extreme precision or work like an army of nano surgeons, operating from within.

At ETH Zurich, mechanical engineers have worked on nanobots for a decade, and are ready to make microscopic robots guided by externally generated magnetic fields for use in the human body.

The nanobots have been tested in the eye, where it was made to deliver drugs in the retinal area to treat muscular degeneration, which can cause blindness.

In the future we may be able to make nanobots that will swim up to our brain from within our bloodstream and send us information and knowledge.

Also more recently, people in the field have been looking at other applications like water treatment, in which millions of these devices can swim through polluted water.



Another field where nanobots can be used are, the industries. Factories could employ nanotechnology to build complete products. Since they can use raw molecules, industrial nanobots would only need the most basic of raw materials to construct nearly anything.

Nanotechnology is a fairly new science and can hold solutions to many of the pressing problems that we face in today's world. Its endless potential can revolutionize the fields of medicine, environmental science, industry, warfare, etc.

## did you know?

### Fast Charging Batteries-not a myth

Scientists at Nanyang Technology University Singapore (NTU) have developed ultra-fast charging batteries that can be recharged up to 70 per cent in only two minutes. The new generation batteries also have a long lifespan of over 20 years, more than 10 times compared to existing lithium-ion batteries.

The implications are mind blowing. This breakthrough has a wide-ranging impact on all industries, especially for electric vehicles; we can save tens of thousands of rupees on battery replacement costs and recharging can be done in just a matter of minutes.

Commonly used in mobile phones, tablets, and in electric vehicles, rechargeable lithium-ion batteries usually last about 500 recharge cycles. In the new NTU-developed battery, the traditional graphite used for the anode (negative pole) in lithium-ion batteries is replaced with a new gel material made from titanium dioxide, which is an abundant, cheap and safe material found in soil. The NTU team has found a way to transform the titanium dioxide into tiny nanotubes, which is a thousand times thinner than the diameter of a human hair. This speeds up the chemical reactions taking place in the new battery, allowing for superfast charging.

### Power Line Communication(PLC)

It's common knowledge that power cables hanging from huge steel towers are used to transfer electricity to all load centers from the generators end. But could these be used for communication purposes too??

Power line communication(PLC) also known as power line networking(PLN) and Power line digital subscriber line(PDSL) is an approach to use existing power lines as communication links. It is analogous to how telephone lines are used to provide broadband services. The major advantage of using PLC is its well established interconnection and zero cost of setting up a channel for information transfer.

PLC is complex for it lies at the intersection of various engineering disciplines like line theory, electromagnetic theory, signal processing etc. It operates by addition of modulated carrier to the power line.

Different types of PLC use different frequency bands. Power lines have limited ability to carry higher frequencies for they are designed to predominantly carry signals of power frequency.

PLC is used to provide high speed access points, but higher data rates imply shorter distances. To put that in perspective a link operating at a million bits per second may only be able to cover one floor of an office. It also finds application in home automation (home lighting), in automobiles, and is employed in the smart-grid for metering, monitoring and distribution automation.

### Project ARA

Google's modular phone concept, Project ARA is making the modular phone concept a reality. Based on the phonebloks concept by Dave Hakkens, Project ARA is a development effort with the aim to empower users with a phone that is tailor-made to meet their requirements and can be modified as per the situation. It all starts with an endoskeleton, the structural frame which the user can populate with "modules", building blocks that make up a vast majority of the phone's functionality and features. In simple words, it's like putting Lego bricks together on a base we can remove the bricks which we don't like and insert new ones. You want to change your camera, you remove your existing camera module and replace it with a superior one. Same goes for the speaker, screen and the BATTERY.

The Spiral 2, a working prototype of the Project ARA modular phone was released in January and, unfortunately, has specifications much lower than that of standard flagship phones.

Even though Project ARA has a long way to go before its devices can become everyday usable, Google is surely working on something that can revolutionize the smartphone industry and the way we use it...

### Check it out!!

Here's a surprise for all geeks, who code away in MATLAB; Hidden inside this MATrix LABoratory, are several EASTER EGGS!!

Type in the following commands and watch closely: **why, spy, shower**

The list is long, but full of surprises and fun! Happy Coding and Happy Easter to you all!



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