



CANARA ENGINEERING COLLEGE

Department of CSE

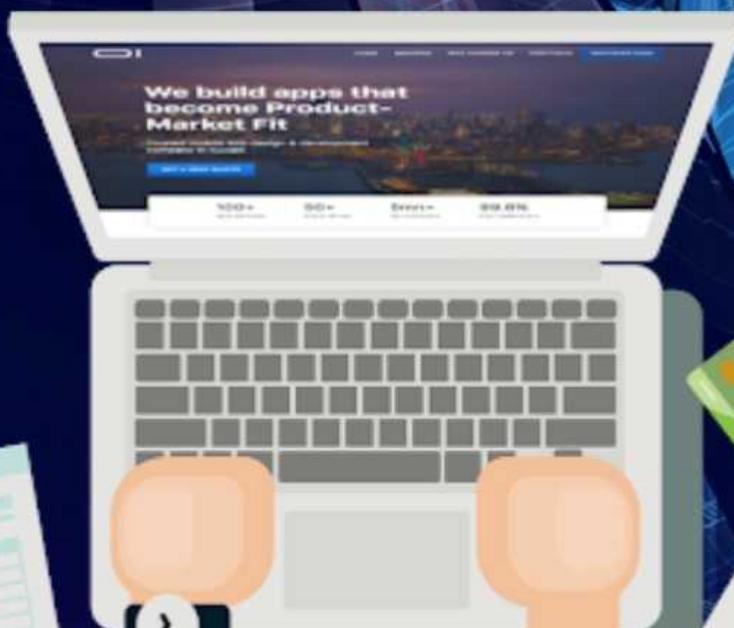


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DEPARTMENT VISION

To be recognized as a center of knowledge dissemination in Computer Science and Engineering by imparting value-added education to transform budding minds into competent computer professionals.

DEPARTMENT MISSION

- Provide a learning environment enriched with ethics that helps in enhancing problem solving skills of students and, cater to the needs of the society and industry.
- Expose the students to cutting-edge technologies and state-of-the-art tools in the many areas of Computer Science & Engineering.
- Create opportunities for all round development of students through co-curricular and extra-curricular activities.
- Promote research, innovation and development activities among staff and students.

PROGRAM EDUCATIONAL OBJECTIVES

- Graduates will work productively as computer science engineers exhibiting ethical qualities and leadership roles in multi-disciplinary teams.
- Graduates will adapt to the changing technologies, tools and societal requirements.
- Graduates will design and deploy software that meets the needs of individuals and the industries.
- Graduates will take up higher education and/or be associated with the field so that they can keep themselves abreast of Research & Development.

PROGRAM OUTCOMES

- 1. Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.
- 2. Problem analysis:** Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.
- 3. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal and environmental considerations.
- 4. Conduct investigations of complex problems:** Use research-based knowledge and research methods, including design of experiments, analysis and interpretation of data and synthesis of the information to provide valid conclusions.

5. **Modern tool usage:** Select/Create and apply appropriate techniques, resources and modern engineering and IT tools, including prediction and modelling to complex engineering activities, taking comprehensive cognizance of their limitations.
6. **The Engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and Sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts and demonstrate the knowledge of and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the relevant scientific and/or engineering practices.
9. **Individual and team work:** Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with the society-at-large, such as being able to comprehend and write effective reports and design documentation, make effective presentations and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work as a member and leader in a team to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for and above have the preparation and ability to engage in independent and life-long learning in the broadcast context of technological changes.

PROGRAM SPECIFIC OUTCOMES

- a. **Computer System Design:** Ability to apply the knowledge of computer system design principles in building system software and hardware components.
- b. **Computer Communication and Internet Applications:** Ability to apply knowledge of layered network Models, their protocols and technologies in building network and Internet based applications.
- c. **Solve Computational Problems:** Apply the theoretical foundations of computer science in modeling and developing solutions to the real world problems.
- d. **Software System Design and Development:** Design and develop the application software systems that meet the automation needs of society and industry.

Innovations that made the Engineer's proud

1. New tool helps users decide which countries their Internet traffic transits

Date: August 2, 2018

Source: Princeton University, Engineering School

Summary: The Internet gives people worldwide access to applications and services, but in many cases, Internet traffic passes through a few dominant countries, according to new research.

Following the 2013 revelations of U.S. government surveillance, officials from several countries expressed a desire to reduce their dependence on U.S. communications infrastructure. Brazil has taken notable steps toward this goal; including beginning construction of an underwater cable to Portugal and developing a large ecosystem of internet exchange points to help in-country networks better connect. By examining traffic to the 100 most popular websites in several countries, the researchers revealed that a large fraction of internet routing paths from Brazil, India and Kenya passed through the United States or Europe. They also piloted a tool called RAN (Region-Aware Networking) that allows users to reroute traffic to avoid going through a particular country by diverting traffic through intermediate points. In most cases, the tool significantly increased the percentage of routes to the top 100 websites that avoided a given country. For instance, without the tool's relays only 50 percent of paths from Kenya could avoid transiting Britain; Region-Aware Networking allowed 97 percent of paths to avoid Britain. The tool also led to modest decreases in tromboning paths.

"The internet grew up without borders, but now people who care about privacy and freedom of expression are starting to be concerned about where their internet traffic goes," said Jedidiah Crandall, a computer scientist at the University of New Mexico who was not involved in the research. "At the same time, nation-states are developing their own ideas about borders on the internet. Where the borders actually are today is an important scientific question that this paper makes impressive progress towards answering."

Edmundson's co-authors include computer science professors Nick Feamster, deputy director of Princeton's Center for Information Technology Policy; Jennifer Rexford, the Gordon Y.S. Wu Professor in Engineering and chair of the Department of Computer Science; and Roya Ensafi, a former postdoctoral researcher in Feamster's group who is now a research assistant professor at the University of Michigan. Support for this research was provided by the Department of Defense and the National Science Foundation.

Amazing facts:

1. The first electronic computer ENIAC weighed more than 27 tons and took up 1800 square feet.
2. Only about 10% of the world's currency is physical money, the rest only exists on computers.

2. Computer simulations predict the spread of HIV

Date: August 1, 2018

Source: DOE/Los Alamos National Laboratory

Summary: In a new study, researchers show that computer simulations can accurately predict the transmission of HIV across populations, which could aid in preventing the disease.

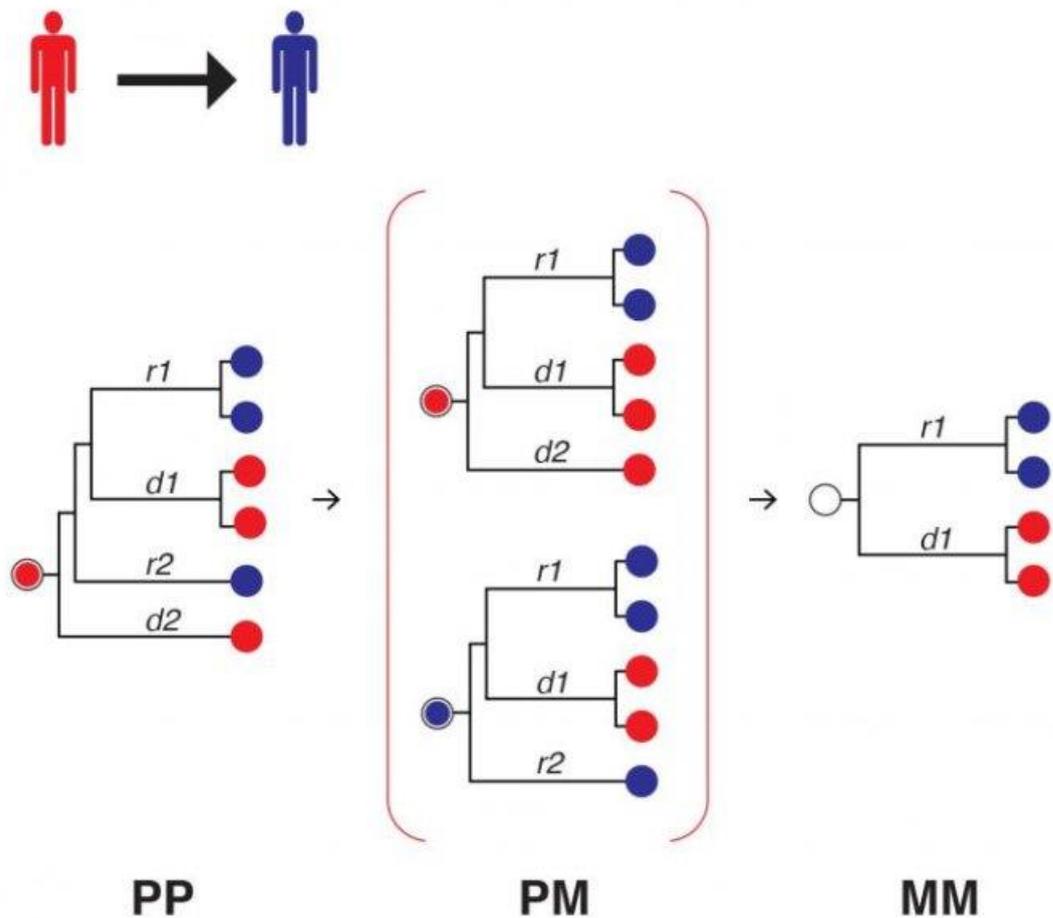
"Genetic signatures trace origin of infection and its potential path through populations, allowing state health departments to track the disease"

The simulations were consistent with actual DNA data obtained from a global public HIV database, developed and maintained by Los Alamos. The archive has more than 840,000 published HIV sequences for scientific research.

HIV is particularly interesting to study in this manner, Leitner noted, as the virus mutates rapidly and constantly within each infected individual. The changing "genetic signatures" of its code provide a path

that researchers can follow in determining the origin and time frame of an infection, and the computer simulations are now proven to be successful in tracking and predicting the virus's movements through populations.

The rapid mutational capability of the virus is useful for the epidemiological sleuthing, but also is one of the features that makes it so difficult to tackle with a vaccine.



This is the principal decay of paraphyletic signal.

Credit: Los Alamos National Laboratory.

Leitner and Ethan Romero-Severson, the study's co-author and a Los Alamos theoretical biologist, used phylogenetic methods, examining evolutionary relationships in the virus's genetic code to evaluate how HIV is transmitted. They found that certain phylogenetic "family tree" patterns correlated to the DNA data from 955 pairs of people, in which the transmitter and recipient of the virus were known. "These HIV transmissions had known linkage based on epidemiological information such as partner studies, mother-to-child transmission, pairs identified by contact tracing, and criminal cases," the authors write. Leitner said the cutting-edge modelling tools can also be used to predict the patterns of other rapidly evolving infectious diseases.

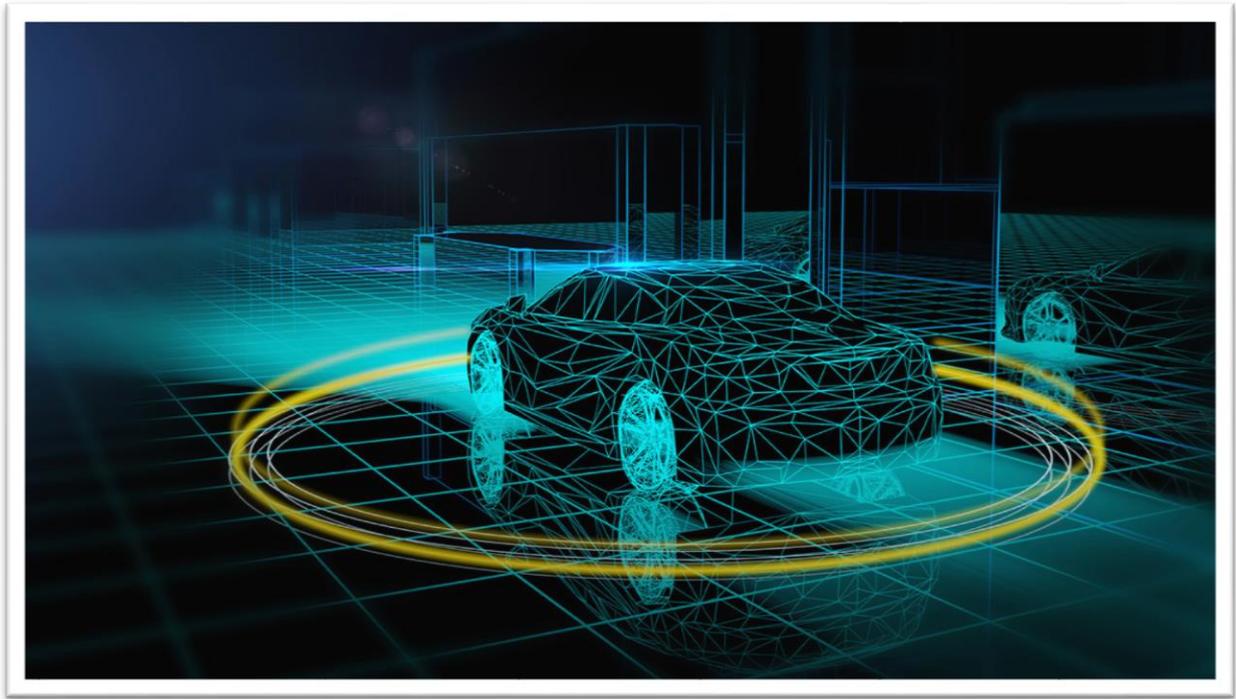
Los Alamos has a strong history in genetic data analysis, having been the site of the original GenBank project in 1979, known at the time as the Los Alamos Sequence Database and established by Walter Goad of the Theoretical Biology and Biophysics Group.

Amazing facts:

TYPEWRITER is the longest word that you can write using the letters only on one row of the keyboard of your computer.

Trending technologies

Edge Computing Enables Intelligent Networks

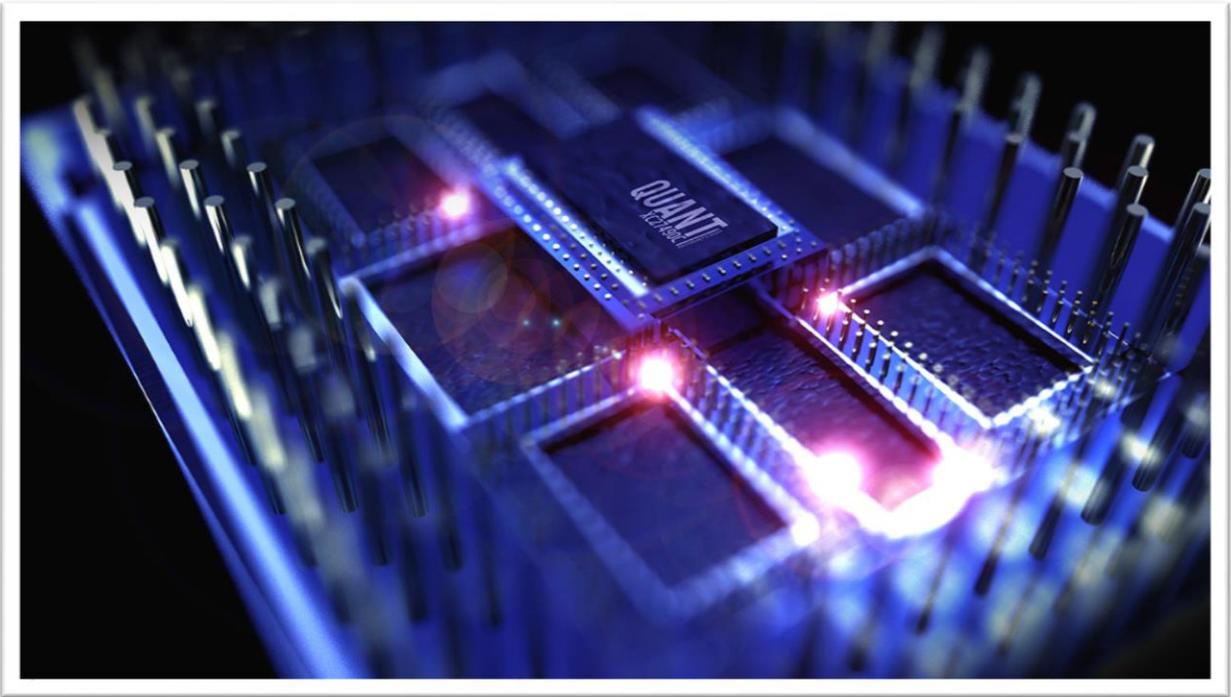


Edge computing is the key factor to make the Internet of Things work since connected devices will generate so much data that transmitting, storing and analysing all that data at a central location is no longer viable. Not only that, connected devices such as drones, self-driving cars or robots will, most likely, require extreme rapid processing. Creating the data, sending it to the cloud for analysis and returning the results to the device will simply take up too much time.

The predictions are that in the coming decade, we will add approximately 100 trillion sensors to our global economy, generating an unfathomable amount of data. The solution for all this data that requires rapid processing is doing edge computing; computations on the sensor itself, albeit at first this will be done on the device instead of on the sensor. Peter Levine, a general partner at venture capital firm Andreessen Horowitz, even believes that edge computing will slowly take over cloud computing. Although that might sound pretty crazy, it also seems very logical. Today, an average self-driving car produces approximately 1 Gigabyte of data per second, which will likely increase in the years to come. Having to send that data to the cloud analyse it and return the results would simply not work.

Therefore, in 2018, we will see increased attention to edge computing to enable intelligent networks, where connected devices will perform the required analytics at location and use the results to perform a certain action. It will happen in a few milliseconds, instead of the few hundred milliseconds it takes today when using cloud computing. With self-driving cars that difference can be the difference between a crash and a safe ride home. The world's cloud computing giants are not ignorant about the opportunities of edge computing. Microsoft has developed Azure IoT Edge and Amazon recently developed AWS Green grass. In addition, start-ups such as Packet and Vapor IO are also bringing cloud computing to the edges. In 2018, edge computing will find its way to connected devices, before truly taking off in 2019

A Quantum Computing Arms Race Will Lead to First Results



In this year's hype cycle for emerging technologies, Gartner estimated that quantum computing is still more than ten years away. However, the developments in quantum computing are going a lot faster than expected. The race for the holy grail of computing is on and companies such as Google, D-Wave or IBM, universities such as Yale or UNSW or start-ups such as Rigetti Computing are all working on developing quantum computers. Each of these organisations has reported breakthroughs in 2017, with the latest being IBM who announced the first 50-qubit quantum processor in November 2017.

A 50-qubit quantum processor is getting closer to quantum supremacy, which IBM now estimates to be at around 57-qubits. Quantum supremacy is defined as the ability of quantum computing to solve problems which can no longer be solved with the world's fastest supercomputer. Not only organisations are working on achieving this quantum supremacy, but also countries are investing billions in it. China is building the world's biggest quantum research facility. Their objective is to have a quantum computer by 2020 that has the computational power of a million times all computers in the world combined.

With several organisations aiming to reach quantum supremacy before the end of this year, there is a real arms race going on. According to Vijay Pande, a partner at venture capital firm Andreessen Horowitz, quantum computing is moving out of the science domain and into the engineering phase. Therefore, 2018 will likely see several organisations reach quantum supremacy and focus on scaling up the technology to start working on some of the world's biggest problems.

Amazing facts:

- 1. Douglas Engelbart invented the first computer mouse in around 1964 which was made of wood.**
- 2. More than 5000 new computer viruses are released every month.**

Renowned personality



G . Samuel . Hurst - Inventor of touchscreen

Born in 1927, Researcher. Professor, Inventor. University of Kentucky, M.S. 1948.

He is a retired corporate research Fellow from Oak Ridge National Laboratory where his 33-year career involved research on instrumentation, atomic physics, gaseous electronics and laser physics, including original work on Resonance Ionization Spectroscopy (RIS). He has over 30 patents in the fields of radiation, detectors, touch screens and RIS. In 1947 he earned a degree in physics from Berea College. He received a doctoral degree from the University of Tennessee in 1959.

High school - Bell County High School , Kentucky.

B.A. degree (physics and a minor in mathematics)- Berea College.

M.S. degree (physics)-University of Kentucky [1948].

Ph.D.(physics)- University of Tennessee[1959]

Hurst taught physics at UK from 1966-70. While at UK, he invented the widely-used computer touch screen. G. Samuel Hurst was inducted into the Hall of Distinguished Alumni on May 13, 2005. Sam worked as a researcher in the Health Physics Division, where he made many major contributions, especially in neutron dosimetry and spectroscopy, plus numerous significant contributions in instrumentation and field analysis.

Hurst's career took an exciting new direction into ultra-sensitive laser-based spectroscopy. He held over 30 patents and authored numerous technical papers. He invented the original computer touch screen.

The father of one-atom physics and the inventor of today's omnipresent touch screen technology, G. Samuel Hurst, let curiosity lead him. In the process, he created a technological revolution that has changed the way we interact with our world.

In 1971, Dr. Samuel C. Hurst - the founder of Elo TouchSystems - invented the world's first electronic touch screen interface. Today, over 30 years later, Elo is still leading the way: not only are we considered the standard for touch technology, we are also renowned for our wide range of integrated touch screen systems as well as our dedicated customer service.

American inventor Dr. G. Samuel Hurst developed resistive touchscreens almost accidentally.

To study atomic physics the research team used an overworked Van de Graff accelerator that was only available at night. Tedious analyses slowed their research. Sam thought of a way to solve that problem. He, Parks, and Thurman Stewart, another doctoral student, used electrically conductive paper to read a pair of x- and y- coordinates. That idea led to the first touch screen for a computer. With this prototype, his students could compute in a few hours what otherwise had taken days to accomplish.

Hurst, however, had other ideas. In 1970, after he returned to work at the Oak Ridge National Laboratory (ORNL), Hurst began an after-hours experiment. In his basement, Hurst and nine friends from various other areas of expertise set out to refine what had been accidentally invented. The group

called its fledgling venture "Elographics," and the team discovered that a touch screen on a computer monitor made for an excellent method of interaction. All the screen needed was a conductive cover sheet to make contact with the sheet that contained the X- and Y-axis. Pressure on the cover sheet allowed voltage to flow between the X wires and the Y wires, which could be measured to indicate coordinates. This discovery helped found what we today refer to as resistive touch technology (because it responds purely to pressure rather than electrical conductivity, working with both a stylus and a finger).

By 1971, a number of different touch-capable machines had been introduced, though none were pressure sensitive. One of the most widely used touch-capable devices at the time was the University of Illinois's PLATO IV terminal—one of the first generalized computer assisted instruction systems. The PLATO IV eschewed capacitive or resistive touch in favor of an infrared system . PLATO IV was the first touch screen computer to be used in a classroom that allowed students to touch the screen to answer questions.

Tech Predictions

NANOBOT's

Definition - What does Nanobot means

Nanobots are robots that are microscopic in nature, measured largely on the scale of nanometers. They are currently in the research and development phase, but on realization they are expected to do specific tasks at the atomic, molecular and cellular level and help in bringing about many breakthroughs, especially in medical science.



Nanobots are also known as nanomachines, nanorobots, nanomites, nanites or nanoids. Nanobots can be considered to be machine version of a bacteria or virus. They can be biological or synthetic, but are adapted to perform preprogrammed tasks at the atomic level. They are expected to be autonomous in nature and powered by a small cell or battery, or even solar cells. The whole idea behind nanobots is in having a device which can interact at the nano scale and help in understanding or manipulating structures at the nanoscale level. In the development of nanobots, nanoassembly and nanomanipulation have important roles.

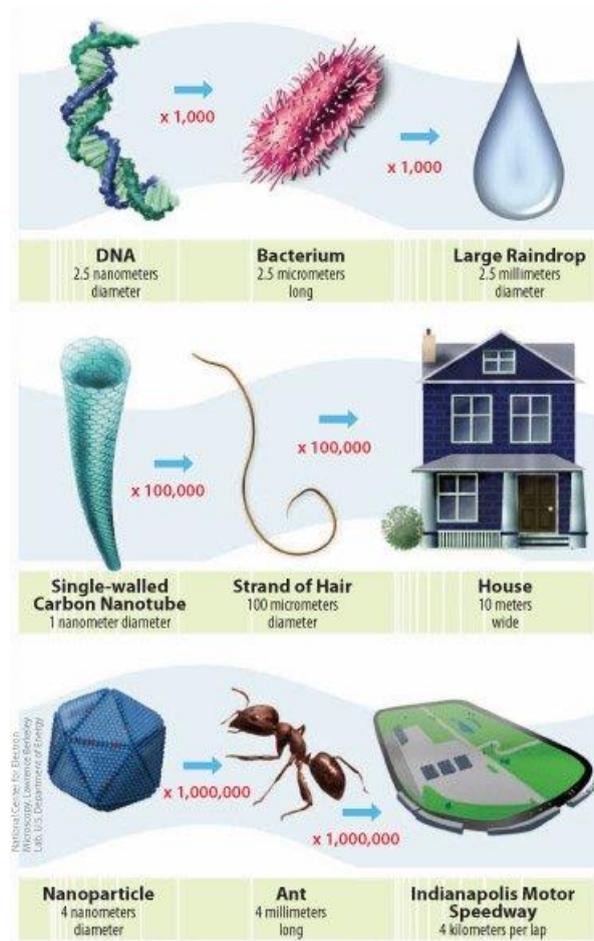
Considering their potential, nanobots find their first and most prominent applications in medical science. Applications such as closing open wounds, rebuilding ruptured arteries and veins and traversing through the body for diagnoses are some important realizations. They are expected to aid in research related to cancer, AIDS and other major diseases as well as in helping brain, heart and diabetes research. Other applications where nanobots can potentially be of use are in aerospace, security, defense, electronics and environmental protection.

Nanorobotics is the technology of creating machines or robots at or close to the microscopic scale of a nanometer (10⁻⁹ meters). More specifically, nanorobotics refers to the still largely hypothetical

nanotechnology engineering discipline of designing and building nanorobots, devices ranging in size from 0.1-10 micrometers and constructed of nanoscale or molecular components.

Grey Goo

Grey goo (alternatively spelled gray goo) is a hypothetical end-of-the-world scenario involving molecular nanotechnology in which out-of-control self-replicating robots consume all matter on Earth while building more of themselves, a scenario known as ecophagy ("eating the environment").



A nanometer is one-billionth of a meter. In comparison, a human hair is about 100,000 nanometers in diameter. All dimensions are approximate. Nanoparticle is courtesy of the National Center for Electron Microscopy, Lawrence Berkeley Lab, US Department of Energy.

Amazing facts:

1. Around 50% of all Wikipedia vandalism is caught by a single computer program with more than 90% accuracy.
2. If there was a computer as powerful as the human brain, it would be able to do 38 thousand trillion operations per second and hold more than 3580 terabytes of memory.
3. The password for the computer controls of nuclear tipped missiles of the U.S was 00000000 for eight years.
4. Approximately 70% of virus writers are said to work under contract for organized crime syndicates.
5. HP, Microsoft and Apple have one very interesting thing in common – they were all started in a garage

Technological advancements and their effects on humanity

Our personal life is highly dependent on the technology that people have developed. Technology has advanced with years and it has changed the way we purchase products, the way we live, the way we communicate, the way we travel, the way we learn and so many changes have been brought about by these continuous technological advancements. As people's demands and life style change, the demand for advancing the type of technology we use is high. Almost everything we use has been innovated to better standards, a good example is the "Mobile Phone", the type of mobile phones we had in 1995 are no longer on demand in this century, the demands of mobile phone users have changed greatly, and this has resulted in the advancement of mobile phone technologies.

Technological Advancements in Agriculture: Agricultural technological advancement has played a big role in changing the face of agriculture. This has resulted into increased production and abundant food supply. technological advances in agriculture include ; Agricultural Machinery , Agriculture Biotechnology , GM Food , Cloned Sheep , Organic fruits , Artificial Fruits , Livestock farming , Cattle Breeding , Cattle Slaughter.

Technological Advancements in Education: Technology advancement has greatly changed the education sector. We now days learn through mobile gadgets and tablets. Technology has simplified the way teachers reach their students and it has also helped students learn from anywhere as well as enable them access academic information at anytime from anywhere. Information is power, so both students and teachers can use advanced technologies for education to make research on subjects of interest. Some of the most popular technology advances which have changed the face of education include: Use of smart phones in classroom, use of tablets and mobile computers in education and classroom , use of smart whiteboards for visual illustration in the classroom, use of internet for long distance learning , Use of social ,media to connect students with teachers.

Future of Technology Startups: India in 2050

It is predicted that before 2050 we will see a computer pass the Turing test, where a machine will be able to exhibit intelligent behavior equivalent to, or indistinguishable from, that of a human.

Over 60 years ago, a group of engineers and researchers choose "silicon" as the most appropriate semiconductor material and started a company in California and with the help of an investment banker, raised over a million dollars. The startup, later named Fairchild Semiconductors; the founders referred to as the "traitorous eight"; Arthur Rock, the investment banker who started one of the earliest successful venture firms and the nearby Stanford University, became the bedrock upon which the present day Silicon Valley is built.

Inspired by Silicon Valley, many countries attempted to create their entrepreneurial eco-system. India, post liberalization in the early 90s, saw her share of this startup wave playing out. Massive opportunities in software development services created large companies with Indian engineers building world-class software for several companies worldwide. However, India's role in the startup world was largely limited to her very talented engineers and businessmen and women working for startups worldwide. A cost advantage and an absence of risk capital encouraged many to start software services companies in India increasing the pool of skilled workforce.

The first wave of Indian startups of the early millennium was primarily focused on bringing services already available in the offline world online, like ticket bookings, employment discovery and matrimonial services. Some of these startups were massive successes as well. The last ten years saw many venture capital organisations being set up in India. Armed with money mostly from the west and run by Indian fund managers, these funds looked for bright entrepreneurs addressing the growing local market.

Will things change over the next 25 years? History teaches us that breakthrough technologies rarely happen in isolation and the most influential technologies are humble and low cost. Some factors are coming together to propel India's startup eco-system in a way that we may not be able to comprehend today completely.

- We now have Aadhar, the largest identity database in the world built ground up and entirely in India that could form the bedrock on which all digital services are built, producing an enormous amount of data.
- The democratisation of Computing, Commoditization of Infrastructure and Newer models of Software Distribution has created a level playing field between the incumbents and the challengers.
- There are early indicators of deep technology startups in the areas of AI, Robotics, IOT, Nanotech and even space tech startups attracting Venture Capital.
- The number of IITs, the prestigious institute of higher education in India has tripled in the last ten years.

It is predicted that before 2050 we will see a computer pass the Turing test, where a machine will be able to exhibit intelligent behaviour equivalent to, or indistinguishable from, that of a human. Any form of AI needs data and India will probably be the richest country in terms of data. Indian startups have a massive opportunity to build deep technology organisations efficiently.

Predicting the future is an entertaining exercise, but we now have a real opportunity at creating it ourselves. Eric Schmidt, the former CEO of Google, said a few years ago "Just think what will happen when India's entrepreneurial innovators can create great global companies without leaving their country. They will change the world. Hundreds of large firms focused on the Internet will be founded and will succeed by focusing purely on Indian consumers, Indian taste, and Indian style, and one of them can ultimately become the next Google".

Successful START-UPS



Zomato – An Aggregation Of Restaurant & Other Food-Related Destinations

"Zomato" is a one-stop-solution to all your cravings, be it for food, beverages, and alcohol. It's an online restaurant discovery guide providing information on home delivery service, cafes, and nightlife!

Mr. Deepinder Goyal and Mr. Pankaj Chaddah are the co-founders of "Zomato" and today, this brand gets an international recognition. When they started their startup Zomato, they did not even have

enough funds and as they say, hard work pays quite evident it is. Today, Zomato we all know is a supreme success with its popularity around the world.

On February 2, 2015 Zomato was on a roll. It had just acquired Urbanspoon, a big-time player in Canada and Australia, and was going places (it was expanding across geographies). There was an unmistakable air of pride in Mr. Deepinder Goyal gait as he walked up to me and shook hands.

“Wow, what confidence,” I had thought to myself as Deepinder approached me. The CEO and Co-founder of Zomato was dressed casually in a t-shirt and jeans looking debonair and unaffected by the winter chill (in more ways than one) that still hung over Delhi.

He took each of my questions and hit it for a six. When asked about his “rumored” strategy to hire people, he laughed at my question and said, “What’s wrong with poaching people? I am very shameless about it. If someone wants to leave his/her company, why should it be my problem? If you want to call people at Zomato, please go ahead and call.

Zomato has taken significant steps towards growing revenue and reducing costs. As per numbers reported by Info Edge (Naukri.com) which holds a significant minority in Zomato, Zomato's revenues shot up by 80 percent to Rs 333 crores for the financial year March 2017. The loss number for the year is Rs 389 crores - and the company is inching towards profitability. Dig a little deeper and you will realise that profitability is a reasonable target for Zomato. The operating burn in FY 2017 was around Rs 77 crores, the balance Rs 312 crores being one off items, non-cash items, and non-operating expenses. They hit a three million mark" for orders in a month.

