## Practical Quantum Computers

One of the labs at QuTech, a Dutch research institute, is responsible for some of the world's most advanced work on quantum computing, but it looks like an HVAC testing facility. Tucked away in a quiet corner of the applied sciences building at Delft University of Technology, the space is devoid of people. Buzzing with resonant waves as if occupied by a swarm of electric katydids, it is cluttered by tangles of insulated tubes, wires, and control hardware erupting from big blue cylinders on three and four legs.
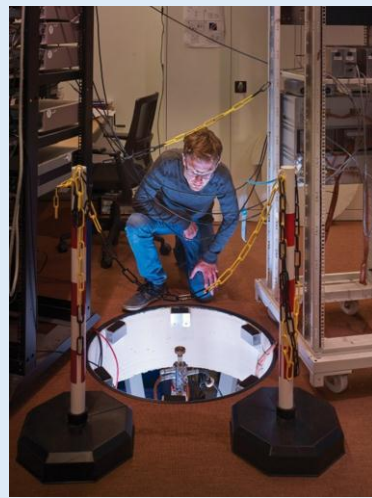
Inside the blue cylinders—essentially supercharged refrigerators—spooky quantum-mechanical things are happening where nanowires, semiconductors, and superconductors meet at just a hair above absolute zero.

It's here, down at the limits of physics, that solid materials give rise to so-called quasiparticles, whose unusual behavior gives them the potential to serve as the key components of quantum computers.

This robot can follow pedestrian traffic rules

Engineers at Massachusetts Institute of Technology (MIT) have designed an autonomous robot that can keep pace with foot traffic while observing the general social codes that pedestrians follow to avoid oncoming obstacles while keeping up a steady walking pace. In drive tests,

the robot, which resembles a knee-high kiosk on wheels, successfully avoided collisions while keeping up with the average flow of pedestrians, said the researchers who have detailed their robotic design in a paper scheduled to be presented at the IEEE Conference on Intelligent Robots and Systems to be held in Vancouver, Canada, in September.
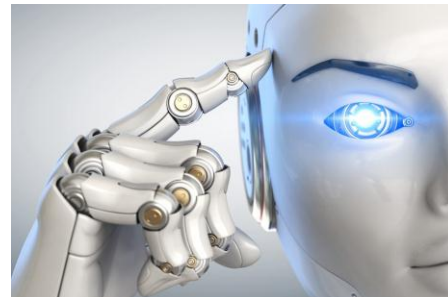
"Socially aware navigation is a central capability for mobile robots operating in environments that require frequent interactions with pedestrians," said lead author of the study Yu Fan (Steven) Chen.

Chen and his colleagues used standard approaches to solve the problems of localisation and perception.

IoT workshop

Students attended an informative and valuable workshop on Interntet of things (IOT) Organized by the department. Participation of the students was warm and they were filled with enthusiasm and energy throughout.

IT INNOVATORS

Wendell Lim: Programming Tiny "CellBots" to Fight Cancer

Immunotherapy—in which the body's immune system is stimulated to attack tumor cells—is already seen as one of the more promising new approaches to fighting cancer. But Wendell Lim is taking this innovative treatment to another level. In September, a team led by Lim, a researcher at the University of California, San Francisco and an investigator for the Howard Hughes Medical Institute, published a study revealing that they were able to synthetically program T cells to function in more sophisticated, targeted ways.

(Image courtesy of Wendell Lim)

Justin Kao: An Online Store for DNA Analysis

Now that it's possible to get your DNA analyzed, why not have the equivalent of an apps store where you're given a choice of what else you want to learn about your genes? That's the premise behind Helix, a personal genomics company looking to become the online marketplace for genetic self-analysis. Justin Kao, one of the San Francisco firm's co-founders and now its senior vice president of development and partnerships, sees a business with much potential. "There will come a time in our life when every single person is going to benefit from having his or her DNA sequence readily available," he says.

(Image courtesy of Justin Kao)

Kendra Kuhl, Nicholas Flanders, Etosha Cave: Turning Waste CO2 Into Useful Products

One of the bigger challenges of reducing greenhouse gas emissions has been making carbon capture feasible on a meaningful scale. That's the process where waste carbon dioxide from fossil fuel power plants is "captured" and stored underground, instead of being released into the atmosphere. However, it largely remains an expensive and difficult undertaking.

But what if all that waste carbon dioxide could be converted into products that could be used?

(Opus 12)

Open-Source Development Workshop

An informative worskhop on Open-Source Development was organized by the department.

BOTNET OF THINGS

I-TECH UPDATE

Botnets have existed for at least a decade. As early as 2000, hackers were breaking into computers over the Internet and controlling them en masse from centralized systems. Among other things, the hackers used the combined computing power of these botnets to launch distributed denial-of-service attacks, which flood websites with traffic to take them down.

But now the problem is getting worse, thanks to a flood of cheap webcams, digital video recorders, and other gadgets in the "Internet of things." Because these devices typically have little or no security, hackers can take them over with little effort. And that makes it easier than ever to build huge botnets that take down much more than one site at a time.

Similarly, botnets can be used to evade spam filters, which work partly by knowing which computers are sending millions of e-mails. They can speed up password guessing to break into online accounts, mine bitcoins, and do anything else that requires a large network of computers. Criminal organizations rent time on them. This is why botnets are big businesses.

But the botnet activities that most often make headlines are denial-of-service attacks. Dyn seems to have been the victim of some angry hackers, but more financially motivated groups use these attacks as a form of extortion. Political groups use them to silence websites they don't like. Such attacks will certainly be a tactic in any future cyberwar.

As they get more common, this piecemeal defense will become less so. You can also secure yourself against the effects of botnets. For example, several companies sell defenses against denial-of-service attacks.

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TECHNO

TECHNO-DRISHTEE
AN IT-CHRONICLE
Summer Edition May'17-Aug'17

DEPARTMENT OF INFORMATION TECHNOLOGY

IT focuses on information systems and information management. Information Technology is particularly important in the "service" industries such as banking, insurance, and communications. The majority of new jobs in recent years have been in these service industries. The purpose of this B.Tech is to provide the skills of applying advanced design, development, implementation and / or maintenance strategies and techniques in the development of Information Technology solutions; and to effectively manage and administer Information Technology. Presently this department is nurturing the talents of approx. 300 students of different semesters and is dedicated to impart quality education to the students in the field of Information Technology and transforming them from students to technocrats and entrepreneurs.

DEPARTMENT VISION AND MISSION

VISION
To develop competent IT professionals catering to the needs of Industry and society in a global perspective.

MISSION
To attain academic & professional excellence with collective efforts of all stake holders through:

M1: Dissemination of basic concepts and analytical skills.
M2: Exposure to new tools in the area of Information Technology.
M3: Effective interaction with industry for better employability.
M4: Inculcating values and professional ethics with social responsibility.

Hot Solar Cells

Solar panels cover a growing number of rooftops, but even decades after they were first developed, the slabs of silicon remain bulky, expensive, and inefficient. Fundamental limitations prevent these conventional photovoltaics from absorbing more than a fraction of the energy in sunlight. But a team of MIT scientists has built a different sort of solar energy device that uses inventive engineering and advances in materials science to capture far more of the sun's energy. The trick is to first turn sunlight into heat and then convert it back into light, but now focused within the spectrum that solar cells can use. While various researchers have been working for years on so-called solar thermophotovoltaics, the MIT device is the first one to absorb more energy than its photovoltaic cell alone.

IN THIS ISSUE

Department Workshops
An initiative to be up-to-date with the latest news and information related to Department workshops.More on Page 3.

I-TECH Update
A place to showcase the latest innovations in IT for the students' knowledge and information. This bulletin is updated and maintained by the students themselves. More on Page 3

IT Innovators
Featured column on IT innovators of the year and their feats . More on Page 2

LOGIX
Logic and reasoning based questions on page 4.

From the Editor's Pen

Welcoming the Summer 2017, I take my pen to jot down new words in this summer's edition with new enthusiasm.
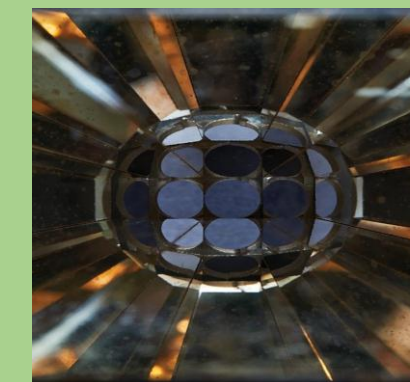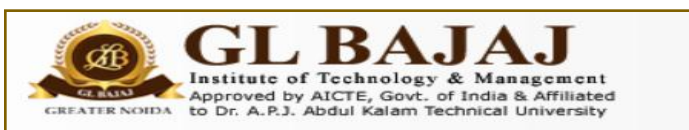
We, the ITians at GLBAJAJ, have dedicated this issue to IT innovators of the year and their feats.

Apart from this, Hot Solar cells, Botnet of things. have been included to give a wider perspective of where IT is leading the world in the Tech Corner.

We are thankful to the students and faculty members of Department of IT, GLBITM for their valuable inputs, and we welcome suggestions and feedback that will help us improve further. We can be reached at tdristee@glbitm.org.