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CYBERBLITZ

RSET
RAJAGIRI SCHOOL OF
ENGINEERING & TECHNOLOGY

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

RAJAGIRI SCHOOL OF ENGINEERING & TECHNOLOGY

RAJAGIRI VALLEY, KAKKANAD, KOCHI 682039, KERALA, INDIA

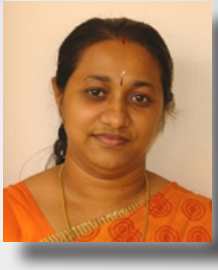
INDEX

DEPARTMENT VISION

To become a Centre of Excellence in Computer Science & Engineering, moulding professionals catering to the research and professional needs of national and international organizations.

DEPARTMENT MISSION

To inspire and nurture students, with up-to-date knowledge in Computer Science & Engineering, ethics, team spirits, leadership abilities, innovation and creativity to come out with solutions meeting the societal needs.



FROM HOD'S DESK

Computing and Computer technology are part of everything that touches our lives. From the household articles to the cars we drive, everything is driven by computer technology. Back in 1991, Kerala was declared as the first complete literate state in India. Later in 2015 Kerala was declared as India's first digital state with 100% mobile density and 75% E-literacy. Basic computer knowledge has now become a necessity. There are several global challenges and these require technology driven solutions. Expertize in computing will enable you to solve challenging problems.

The department gives students plenty of opportunities to showcase their creative works. Projects which is a part of the curriculum is a major platform where the students can take up challenging problems to find solutions. Each student gets the experience of designing, implementing, testing and documenting software systems. The micro project cell in the department also gives challenging problems to students. Big Data Analytics, Natural User Interface (NUI), Software Defined Networks (SDN), Cloud Computing, Internet of Things (IoT), Machine Learning and Intelligent Systems are the technologies that are to dominate the world ten years from now. Producing high quality computing solutions is a creative and challenging task. Choose your projects judiciously.

RSET now have collaborations with external research organizations and industries. KMRL, NeST, Aalen University, Germany and Rajagiri multispeciality tertiary care hospital are a few to mention. Students also get ample opportunities to do projects in association with these organizations. Professional societies like CSI conducts competitions annually to recognize and promote students who demonstrate exceptional talent in developing software applications. Competing in these will help you to enhance your visibility. Dream big, work hard and think positive. As computer engineers you definitely can make a positive difference in the world.

"The future belongs to those who believe in the beauty of their dreams"

- Eleanor Roosevelt

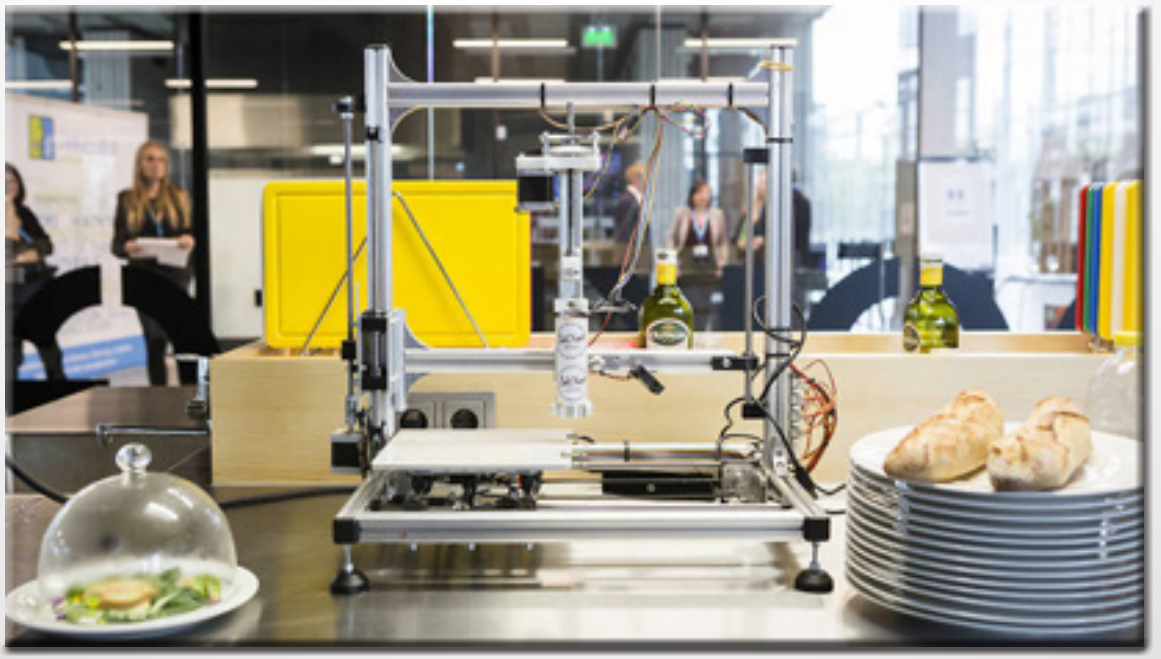
Ms. Shimmi Asokan
Head of the Department
Computer Science& Engineering.

FACULTY CORNER

Food Ink – The World's first 3D Printing Restaurant in London

We have seen 3D printers made by our students for printing/making toys, decorative items etc. But, can we imagine dinners "printed" onto the plates by 3D printers? Yes, it is made possible by Food Ink , the world's first 3D printing restaurant opened in London on 15th July 2016.

At this restaurant, the Chef is a 3D printer. The dishes at Food Ink's 'multi-sensory food experience' are created using a 3D-printer, and produced live in front of the diners' eyes. Joel Castanye and Mateu Blanch are the chefs behind the nine-course extravaganza, which will be eaten using 3D-printed utensils designed by artist Iwona Lisiecka on 3D-printed chairs designed by Arthur Mamou-Mani.
The dinner is only open to ten lucky guests per night and it'll set you back a hefty £250 to be on the guest list. If you're not willing to part with that much cash, Food Ink will also be hosting public open days where visitors can sample 3D-printed snacks and have a go on the printers and pens themselves.



Who knows at some time in future, you just need to stand in front of a 3D printer to get your twin brothers or sisters!!

Mr. K.S Mathew
Professor
Department of CSE

Invisible reCAPTCHA

reCAPTCHA is a free service that protects your website from spam and abuse. reCAPTCHA uses an advanced risk analysis engine and adaptive CAPTCHAs to keep automated software from engaging in abusive activities on your site. It does this while letting your valid users pass through with ease. reCAPTCHA offers more than just spam protection. Every time our CAPTCHAs are solved, that human effort helps digitize text, annotate images, and build machine learning datasets. This in turn helps preserve books, improve maps, and solve hard AI problems.

reCAPTCHA doesn't depend solely on text distortions to separate man from machines. Rather it uses advanced risk analysis techniques, considering the user's entire engagement with the CAPTCHA, and evaluates a broad range of cues that distinguish humans from bots. To prove we're not automated bots, it gave us a single, hopefully quivery "I'm not a robot" click to replace the previous deciphering of blobby melted characters and mathematical problems that made our brains hurt. reCAPTCHA is the most widely used CAPTCHA provider in the world. reCAPTCHA knows when to be tough to keep the bots at bay. We're all aware of the annoying little 'reCAPTCHA' text box which appears on certain web platforms and instructs us to input muddled text (or numbers) to prove that we are humans.

Google is the owner of the infamous CAPTCHA technology, an abbreviated name for the utterly long – Completely Automated Public Turing test to tell Computers and Humans Apart. The tech behemoth is now looking to further improve the user experience with the release of a new undetectable system called 'invisible reCAPTCHA.' As the name itself suggests, this system will integrate computer algorithms to distinguish whether the computer user is a human or not. You wouldn't even be required to interact with your system during the verification process.

Previously, you had to solve a simplistic math puzzle or input certain words to verify that you're a human. The system, which is currently in use, enables you to confirm your identity as a human of this world simply by ticking a checkbox next to the text reading 'I'm not a robot.' This enabled the tech behemoth to reduce the clutter of filling in text boxes while maintaining the same speed and accuracy of spam detection. But it is now ready to take the next leap.

The gist of the latest version of Google's robot checker (Invisible reCAPTCHA) is the machine will be able to detect you're actually a human without you needing to do anything. The electronic doorman will rely on algorithms in Google's Advanced Risk Analysis technology. The algorithms will assess the user 'before, during, and after' encountering a CAPTCHA screen. The new Invisible reCAPTCHA will mean that Google's submerging its bot/human detection technology completely.

Mr. Uday Babu
Assistant Professor
Department of CSE

Image Inpainting

Inpainting is the process of reconstructing lost or deteriorated parts of images and videos. Inpainting, the technique of modifying an image in an undetectable form, is as ancient as art itself. The goals and applications of inpainting are numerous, from the restoration of damaged paintings and photographs to the removal/replacement of selected objects.

The need to retouch the image in an unobtrusive way extended naturally from paintings to photography and film. The purposes remain the same: to revert deterioration (e.g., cracks in photographs or scratches and dust spots in film), or to add or remove elements (e.g., removal of stamped date and red-eye from photographs, the infamous "airbrushing" of political enemies). Digital techniques are starting to be a widespread way of performing inpainting, ranging from attempts to fully automatic detection and removal of scratches in film, all the way to software tools that allow a sophisticated but mostly manual process.

Given an image and a region Ω inside it, the inpainting problem consists in modifying the image values of the pixels in Ω so that this region does not stand out with respect to its surroundings. The purpose of inpainting might be to restore damaged portions of an image (e.g. an old photograph where folds and scratches have left image gaps) or to remove unwanted elements present in the image (e.g. a microphone appearing in a film frame). The region Ω is always given by the user, so the localization of Ω is not part of the inpainting problem. Almost all inpainting algorithms treat Ω as a hard constraint, whereas some methods allow some relaxing of the boundaries of Ω. This definition, given for a single-image problem, extends naturally to the multi-image case therefore this entry covers both image and video inpainting.

Original and restored image

Mainly three groups of works can be found in the literature related to digital inpainting. The first one deals with the restoration of films, the second one is related to texture synthesis, and the third one, a significantly less studied class is related to dis-occlusion.

Ms.Dincy Paul
Assistant Professor
Department of CSE

STUDENT CORNER

Digital Jewelry

May be not today, may be not tomorrow, but it will definitely come. The latest computer craze has been to be able to wear wireless computers. The Computer Fashion Wave, "Digital Jewelry" looks to be the next sizzling fashion trend of the technological wave.

In the next wave of mobile computing devices, our jewelry might double as our cell phones, personal digital assistants (PDAs) and GPS receivers.

Digital jewelry is the fashion jewelry with embedded intelligence. Digital jewelry, can help you solve problems like forgotten passwords and security badges. These devices have a tiny processor and unique identifiers that interact with local sensors. Digital jewelry, is a nascent catchphrase for wearable ID devices that contain personal information like passwords, identification, and account information. They have the potential to be all-in-one replacements for your driver's license, keychain, business cards, credit cards, health insurance card, corporate security badge, and loose cash. They can also solve a common dilemma of todays wired world the forgotten password.

HOW DIGITAL JEWELRY WORKS:-

IBM has developed a prototype of a cell phone that consists of several pieces of digital jewelry that will work together wirelessly, possibly with Bluetooth wireless technology, to perform the functions of the above components.

Here are the pieces of computerized- jewelry phone and their functions:

- Earrings – Speakers embedded into these earrings will be the phone's receiver.
- Necklace – Users will talk into the necklace's embedded microphone.
- Ring – Perhaps the most interesting piece of the phone, this "magic decoder ring, is equipped with light-emitting diodes (LEDs) that flash to indicate an incoming call. It can also be programmed to flash different colors to identify a particular caller or indicate the importance of a call.
- Bracelet – Equipped with a video graphics array (VGA) display, this wrist display

could also be used as a caller identifier that flashes the name and phone number of the caller.

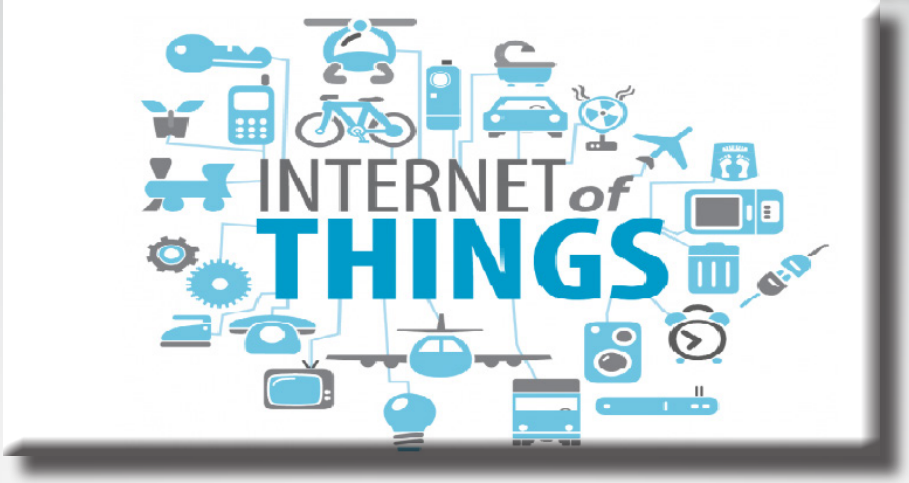
With a jewelry phone, the keypad and dialing function could be integrated into the bracelet, or else dumped altogether — it's likely that voice-recognition software will be used to make calls, a capability that is already commonplace in many of today's cell phones. Simply say the name of the person you want to call and the phone will dial that person. IBM is also working on a miniature rechargeable battery to power these components.

CONCLUSION:-

Digital jewelry can best be defined as wireless, wearable computers that allow you to communicate by Ways of email, voicemail and voice communication. The jewelry work as a set. For example, imagine that your set consists of earrings necklace and a watch. You can pick up your messages and display them on your watch. In order to hear the message if it's a voice message, you can listen it in your earrings. If you want to send out a message, you can talk to your necklace and it will allow you to send a voice message and so on. Features of this digital jewelry are countless.
The basic idea behind the digital jewelry concept is to have the convenience of wireless, wearable computers while remaining fashionably sound. It is hoped to be marketable soon, however, several bugs remain. Charging capabilities and cost are just a sample of the problems that lurk.

The Internet of Things(IoT)

The Internet of Things may be a hot topic in the industry but it's not a new concept. In the early 2000's, Kevin Ashton was laying the groundwork for what would become the Internet of Things (IoT) at MIT's AutoID lab. . Ashton was one of the pioneers who conceived this notion as he searched for ways that Proctor & Gamble could improve its business by linking RFID information to the Internet. The concept was simple but powerful. If all objects in daily life were equipped with identifiers and wireless connectivity, these objects could be communicate with each other and be managed by computers.



Today, the size and cost of wireless radios has dropped tremendously. IPv6 allows us to assign a communications address to billions of devices. Electronics companies are building Wi-Fi and cellular wireless connectivity into a wide range of devices. ABI Research estimates over five billion wireless chips will ship in 2013. Mobile data coverage has improved significantly with many networks offering broadband speeds. While not perfect, battery technology has improved and solar recharging has been built into numerous devices. There will be billions of objects connecting to the network with the next several years. For example, Cisco's Internet of Things Group(IOTG) predicts there will be over 50 billion connected devices by 2020.
The three C's of IoT are: Communication, Control and Automation and Cost Savings.

IoT IN BUSINESS:-

These are just a few examples of how IoT can help a business save money, automate processes and gain new insight into the business. To reap the benefits IoT can provide, a business should address at least the following four items:

1. Define what you'd like to learn from sensors. Over the next three years, a majority of the devices purchased will have sensors and many existing items can be retrofitted with sensors. This will produce a wide range of new data sources for people and systems to use to improve their lives and existing business processes. For example, sensor data that highlights anomalies in equipment vibration can be used to predict and avoid equipment failure.

2. Build an IoT network and security foundation. An IP-based network will help businesses deliver the performance, reliability and interoperability that are required to support global IoT networks and connections with partner ecosystems. As IT embraces IoT, it needs to ensure it has built safeguards into the solution including security procedures such as hardware encryption, physical building security and network security for data in transit. Identity and authentication structures will also need to be updated to support "things" as well as people

3. Collect as much data as possible. Each sensor may only produce a small amount of data, a company will be collecting data from thousands to millions of sensors. Big data technology, such as Hadoop and NoSQL, can give companies the ability to rapidly collect, store and analyze large volumes of disparate IoT data. A company should collect any data that is relevant to existing processes. If possible and cost-effective, a company should also collect additional data that will enable the business to answer new questions in the future.

4. Review the size and scale of IoT providers. IoT is a complicated landscape with numerous categories and many vendors within each category. The four main categories of an IoT solution are: a sensor(s) and radio(s) that often sits in the machine, a M2M device-management platform, a solution delivery platform and apps that enable IoT devices to report or act on data. While there are many vendors, no single vendor offers a complete solution without building partnerships. As a firm begins its IoT voyage, IT and line of business executives should build a cross-functional team to evaluate strategic partners. The team should evaluate the financial position of the vendors, industry knowledge, partnerships and breadth of offerings.

Jobin Varghese
S6 CS Alpha

EXYNOS

Shaheen Nazeer
S6 CS B

Online Trackers Gather Your Info and What They See

Targeted ads have become a way of life. When you search for an airline flight, online snippets keep track of what you looked for and use this information to serve you catered ads. The collected data can be used to determine your ticket prices, decide which ads to show you in the future, and even go as far as change how you feel about yourself.

There are many companies whose sole purpose is to gather and trade people's information. Your age, gender, income, diet, weight, browsing habits, allergies, and job title are all considered succulent snippets of data, and companies use this to help convince you to buy their merchandise…or worse.

It's called targeted advertising, and it's a side of the Internet so new there aren't any regulations to control it. Below we'll talk about the kind of information these companies can see, and how they can use it to both empty your wallet and further their own agenda.

It All Starts with a Cookie:-

Companies like Google and Facebook use cookies to track users across multiple websites over an undisclosed amount of time. When a person clicks on one site and then moves on to another, the cookie embedded in the first site keeps track of that user's searches, thereby building up a repository of information over time.

What's even more alarming is how advertisers have begun combining this data with your social media accounts to create an astoundingly accurate and incredibly scary portrait of who you are.

Over the last few years, advertisers have been hovering social media sites like Facebook, Twitter, LinkedIn, and Instagram to learn more about our interests, our likes/dislikes, and the types of activity we enjoy. They're even able to use social media profiles to access information on your friends and family. (More on this later.)

There was a story a few years ago about a man in Minnesota who got upset at Target because they were sending his teenage daughter coupons for baby clothes. Irate, the father called the company to complain. Little did he know his daughter actually was pregnant, and the customer tracking technology target employed was so precise that it was able to predict an early pregnancy simply based on the items his daughter was searching for online.

This kind of invasive technology goes beyond just ousting someone's deep, dark secrets; companies can harness this data to influence your purchasing habits alter your

opinions, and possibly even use you to further their careers.

Scary Ways Trackers Gather Your Private Info:-

While data mining companies don't keep track of names, they do assign people an individual ID number. The techniques and extent to which these companies are able to track are unclear, but there are a few known methods:

Seeding: This method usually involves a survey requesting access to a specific social media profile in order for a chance to win a prize. As soon as you grant the survey access, you immediately become a seeder. Embedded trackers in the survey will download every bit of data about your friends: their name, age, gender, likes, dislikes, etc., which they can then use to offer them the same survey.

Canvas fingerprinting: This method lets websites track users by drawing an invisible image on the sites you visit. How your computer responds to this image allows the profiler to ascertain your browser, OS, software, and a host of other data. This combination of information will create a unique profile of you, which can be used to track you around the Internet.

Ever heard the phrase "The web never forgets"? This is why. By analyzing your browser history, companies can predict schemes and target ads they believe you'll be interested in. The more you search, the more accurate their ads become.

Cookie syncing: When a user visits a site with an advertiser's cookie embedded, it makes a request to other sites to share information. Once two or more trackers sync cookies, they're able to exchange specific user data between their individual servers, enabling them to paint a much more accurate picture of who you are and what you may be interested in. Cookie syncing has become so accurate it's now able to link two separate ID numbers to the same user, meaning trackers can now link your mobile phone to your desktop computer, creating even more opportunities to exploit your info.

How You Can Protect Your Identity:-

Unfortunately, until sufficient legislation is passed there is very little you can do to change how trackers collect data. However, there are steps you can take to help prevent these companies from acquiring your information.

Changing your browser's individual cookie policy to block outside sources, disabling Flash on your computer, installing Chrome anti-tracking browser extensions like uBlock Origin, and using a VPN can all help keep your identity hidden while protecting your information.

Shenela jayawardena
S6 CS Alpha

The Secret Startup: Magic Leap

Look at the above photo, what do you see?

A man holding a lens, a seemingly ordinary lens. One that can be used on spectacles. But this isn't just any other lens. This lens could very well be the next big thing. "Don't call it a lens: Magic Leap founder" says Rony Abovitz Founder and CEO displaying his company's mysterious photonic light field chip.

Imagine seeing a life sized alien robot right by the side of your bed or your dining table, just standing there waiting to be examined. Or imagine eating breakfast and right up in front of you, a little above your plate, you can see the morning weather written and daily other news, all seemingly real as your breakfast beneath it. This "mysterious photonic light field chip" creates synthetic images that fit in with the space of the real world making it seemingly real.

In terms of design, the headset in the patent resembles skiing goggles, connected to a battery pack. The headset connects to a network, which then connects to a so-called 'passable world model'. This model is created using a database of objects and 'object recognizers. Sensors can also track the wearer's location and position, to make sure images are overlaid on the real world as accurately as possible, with the correct depth and proportions. Buttons on the visor could act like a 'home screen', to take wearers to menus whereas other sensors could recognize finger commands such as focus, copy, select, back or cancel, and right clicks. Magic Leap is expected to directly compete with the likes of Facebook's Oculus Rift headset and Microsoft's HoloLens.

This new version of reality is most often called "Mixed Reality". This technology by Magic Lens combines both augmented reality and virtual reality to form Mixed Reality. Mixed Reality is the merging of real and virtual worlds to produce new environments and visualizations where physical and digital objects co-exist and interact in real time. Mixed reality takes place not only in the physical world or the virtual world, but is a mix of reality and virtual reality, encompassing both augmented reality and augmented

virtuality. To truly understand what mixed reality is, we need understand differences between virtual reality, augmented reality and mixed reality.

Displaying graphical data using Magic Leap

Gmail using Magic leap

Virtual Reality places the user in another location entirely. Whether that location is ¬computer-generated or captured by video, it entirely occludes the user's natural surroundings. In Augmented Reality—like Google Glass or the Yelp app's Monocle feature on mobile devices—the visible natural world is overlaid with a layer of digital content, which means the digital content appears on the screen regardless of the surrounding real world environment. Mixed Reality virtual objects are integrated into, and responsive to, the natural world. A virtual ball under your desk, for example, would be blocked from view unless you bent down to look at it. In theory, MR could become VR in a dark room.

Imagine the possibilities of mixed reality. We could experience things like never before. We can see people who are continents away right in front of our eyes like as if they are standing right in front of us. We could go around exploring other parts of the world right in our living room. Travel experiences, terror as a volcano erupts and lava flows towards you, walking on mountains, flying high above the world, the thrill of free falling from your living room, all made quite easy now.

The potential of such a new technology is immense. Such technology has been shown in movies or TV, but they are going to be real now.

The world has truly gotten smaller!!!

Teni Jacob
S7 CS B

TYPE SCRIPT

A TypeScript is a free and open source language developed by Microsoft. It is a strict superset of JavaScript, and adds optional static typing and class-based object-oriented features to JavaScript language. JavaScript applications such as web e-mail, maps, document editing, and collaboration tools are becoming an increasingly important part of the everyday computing. TypeScript is designed to meet the needs of the JavaScript programming teams that build and maintain large JavaScript programs. TypeScript helps programming teams to define interfaces between software components and to gain insight into the behaviour of existing JavaScript libraries. TypeScript also enables teams to reduce naming conflicts by organizing their code into dynamically-loadable modules. TypeScript's optional type system enables JavaScript programmers to use highly-productive development tools and practices: static checking, symbol-based navigation, statement completion, and code re-factoring.

TypeScript is a syntactic sugar for JavaScript. TypeScript syntax is a superset of Ecmascript 5 (ES5) syntax. Every JavaScript program is also a TypeScript program. The TypeScript compiler performs only file-local transformations on TypeScript programs and does not re-order variables declared in TypeScript. This leads to JavaScript output that closely matches the TypeScript input. TypeScript does not transform variable names, making tractable the direct debugging of emitted JavaScript. TypeScript optionally provides source maps, enabling source-level debugging. TypeScript tools typically emit JavaScript upon file save, preserving the test, edit, refresh cycle commonly used in JavaScript development.

TypeScript syntax includes several proposed features of Ecmascript 6 (ES6), including classes and modules. Classes enable programmers to express common object-oriented patterns in a standard way, making features like inheritance more readable and interoperable. Modules enable programmers to organize their code into components while avoiding naming conflicts. The TypeScript compiler provides module code generation options that support either static or dynamic loading of module contents.

TypeScript also provides to JavaScript programmers a system of optional type annotations. These type annotations are like the JSDoc comments found in the Closure system, but in TypeScript they are integrated directly into the language syntax. This integration makes the code more readable and reduces the maintenance cost of synchronizing type annotations with their corresponding variables. The TypeScript type system enables programmers to express limits on the capabilities of JavaScript objects, and to use tools that enforce these limits. To minimize the number of annotations needed for tools to become

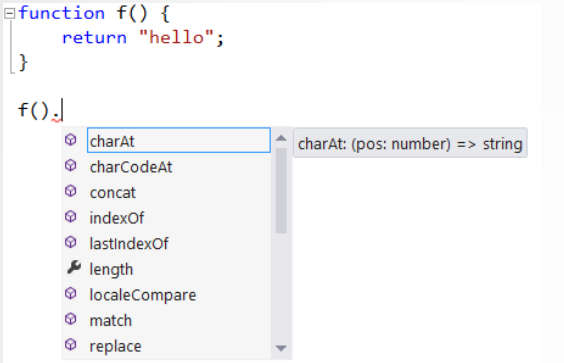
useful, the TypeScript type system makes extensive use of type inference. For example, from the following statement, TypeScript will infer that the variable 'i' has the type number.

```
var i = 0;
```

TypeScript will infer from the following function definition that the function f has return type string.

```
function f() {
 return "hello";
}
```

To benefit from this inference, a programmer can use the TypeScript language service. For example, a code editor can incorporate the TypeScript language service and use the service to find the members of a string object as in the following screen shot.



In this example, the programmer benefits from type inference without providing type annotations. Some beneficial tools, however, do require the programmer to provide type annotations. In TypeScript, we can express a parameter requirement as in the following code fragment.

```
function f(s: string) {
    return s;
    }
f({});      // Error
f("hello"); // Ok
```

This optional type annotation on the parameter 's' lets the TypeScript type checker know that the programmer expects parameter 's' to be of type 'string'. Within the body of function 'f', tools can assume 's' is of type 'string' and provide operator type checking and member completion consistent with this assumption. Tools can also signal an error on the first call to 'f', because 'f' expects a string, not an object, as its parameter. For the function 'f', the TypeScript compiler will emit the following JavaScript code:

```
function f(s) {
    return s;
    }
```

In the JavaScript output, all type annotations have been erased. In general, TypeScript erases all type information before emitting JavaScript. To conclude, TypeScript is 100% compatible with all existing JavaScript code, and optionally adds powerful features such

as static type annotations and language services that turn JavaScript into a highly scalable and powerful language which can be used to develop applications whose codebases span over hundreds of thousands of lines of code. Since the output is plain JavaScript, any JavaScript host (including all browsers) will be able to run it. There is nothing stopping anyone to start using TypeScript immediately.

Sachin Joseph
(Alumini-Software Engineer Microsoft)

MAJOR ACHIEVEMENTS

Congratulation Achievers!!!

Student Exchange Programmes

Johnny Jose
Student Exchange Programme
SOJO University Japan
14th Feb -26th Feb 2016

Icebin Issac
Internship Programme
HIDA Matsue project Japan
16th - 27th January 2017

Sports

Inter-Zone Women Volley ball team(APJ KTU)

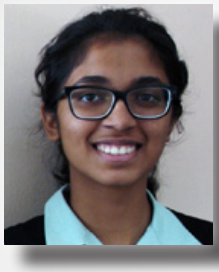
Maria Johnson

Reshma Roy

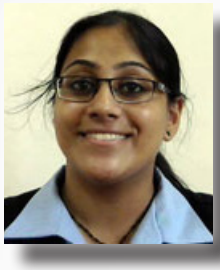
Nimmi Jose

Riya Francis

Inter-Zone Women Basket ball team(APJ KTU)



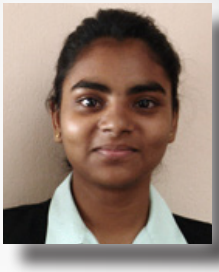
Divya K



Rinu Sibi

Sherin John

Nithi Thomas



Stephy Romichan

Keerthana S

Represented APJ KTU team for the south zone Inter University Table Tennis Championship

Represented MG University team for the south zone Inter University Chess Championship

Sohitha A

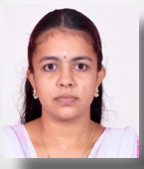
APJ KTU D Zone Football Team

Frederic Thomson

Arts

Participated In Dhwani (M G University) arts Fest in March 2015 and got First Position in Classical Dance.
Participated In Sapraya (M G University) arts Fest in March 2016 and got First Position in Classical Dance.

Kavya Rajagopal



On Desk : Diya Thomas, Jisha Mary Jose, Meera M Illustrations: Nithin P Vijayan