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## UH to Lead Borders, Trade, and Immigration Institute, a DHS Center of Excellence



The Department of Homeland Security (DHS) named the University of Houston (UH) to lead a Center of Excellence focused on borders, trade and immigration research and education. The Borders, Trade, and Immigration (BTI) Institute, established

through a 5-year, \$18 million cooperative agreement with the DHS Science and Technology (S&T) Directorate, is a collaboration with partners from other universities and the private sector.

“Modern borders comprise flows: transnational movements of people, goods, data, and capital. Our vision is to be at the nexus of the nation’s efforts in this area, through transformational technology-driven solutions, data-informed policies, workforce development opportunities for today’s Homeland Security Enterprise, and trans-disciplinary education for the next generation of homeland security experts,” said Ioannis A. Kakadiaris, director of the institute and Hugh Roy and Lillie Cranz Cullen University Professor of computer science at UH. “This institute will give us the opportunity to mobilize the nation’s intellectual capital to solve real-world problems.”

UH President Renu Khator said the new institute is an important addition to the University’s work.

“The University of Houston is committed to providing leadership on issues of critical importance to our region and nation,” she said. “We appreciate the opportunity to lead the Borders, Trade, and Immigration Institute and to add our expertise in these vital areas.”

The Homeland Security Act of 2002 created a framework for DHS to establish university-based Centers of Excellence (COEs) throughout the U.S. to enhance the nation’s homeland security. The BTI Institute is one of 11 currently funded COEs and the only one focused on transnational flows.

It aims to conduct research and provide education materials that enhance the nation’s ability to secure our borders, facilitate legitimate trade and travel, and ensure the integrity of our immigration policies. The BTI Institute’s portfolio

of research and educational projects was selected by the DHS S&T Directorate through open calls for proposals and a competitive process.

In September, the Institute hosted visits by Representatives Michael McCaul (TX-10, R), Chairman of the U.S. House Committee on Homeland Security, and Sheila Jackson Lee (TX-18, D), ranking member of the U.S. House Subcommittee on Crime, Terrorism, Homeland Security, and Investigations. In addition, the Honorable Alan Bersin, Assistant Secretary for International Affairs and Chief Diplomatic Officer, DHS Office of Policy, visited BTI to be briefed on its activities. Bersin oversees DHS’s international engagement, serves as the principal advisor to the Secretary in all matters pertaining to international affairs, and is responsible for leading the Department’s strategic planning and policy formulation functions.

Kakadiaris, an expert in facial recognition technology and principal investigator of the award, has assembled a management team that will work with project teams from participating universities.

Participating universities include Middlebury Institute of International Studies, Rutgers University, Texas A&M International University, Texas A&M Transportation Institute, University of Arizona, University of Minnesota, University of North Carolina-Charlotte, University of Texas-El Paso and West Virginia University. Voir Dire International, LLC, a San Antonio-based company whose services include intelligence and security assessments, is also participating in the institute.

UH-based projects that are funded through the BTI Institute include research on image and video person identification, the effectiveness of cargo security technologies, a workshop on immigration, and an education project to create a capstone experience in security technologies.

Other funded projects deal with face recognition research, human trafficking, queuing control at points of entry, export control reforms, standards development for container security, and training and education for both students and working professionals.

“Additional projects will be identified and funded through an RFP process as the institute continues its work,” Kakadiaris said.

## Message from the Chair



Thank you for your interest in Computer Science at the University of Houston. Let me put in context some of the successes stories of 2016 that are covered in this issue of CS Now! The UH Borders Trade and Immigration Institute, the subject of the cover story, is the largest externally sponsored endeavor led by a computer science faculty member. NATO has selected a team led by Professor Larry Shi to lead a key data security project. Professor Guoning Chen won the National Science Foundation's CAREER Award for his innovative research in visualization of scientific data. Dr. Chang Yun is the winner of a University of Houston Teaching Excellence Award. A student team is placed in the top tier of a Hackathon for developing a body controlled motorbike. Many other highlights could not be covered due to limited space, many of which can be seen at [www.cs.uh.edu](http://www.cs.uh.edu). And this was just another semester at UH Computer Science!

When I joined the UH Computer Science department back in 1999, a single such success would have been a remarkable achievement signifying a banner year for the department. My point is to reflect on our extraordinary achievement of becoming an elite highest quality computer science department as a result of slow but steady enhancements in the quality of coursework, student achievements, size of the student body, cutting edge research, and recruitment of outstanding faculty.

Yet much work remains to be done. The number of Computer Science majors surpassed 1000 for the first time with no end in sight to the growth of interest and opportunities in computing; an excellent problem to have. We are actively recruiting 4 faculty members to strengthen our presence in software engineering, security, high performance computing, and big data analytics. We are in the midst of rolling out a new curriculum to better prepare our students. We are also in the process of identifying additional space and funds for expansion.

- Jaspal Subhlok

## NATO Taps CS Professor to Keep Big Data Secure on the Cloud

In today's hyper-connected world, cybersecurity is always top of mind for UH computer scientist Larry Shi. He says when it comes to data breaches, it's not a question of if, but when.

Shi is the recipient of a \$369,803 NATO award through its Science for Peace and Security (SPS) Programme to keep big data secure on the cloud. He will be designing a new framework to protect big data processing and solve some related problems, such as efficiency, untrusted system administrators and side-channel threats. He and his team have observed that certain computing devices have special features that may help address these cloud-based security concerns.

According to the Identity Theft Resource Center, 169 million personal records were compromised in 2015 through security breaches among business, medical, financial, government and education entities. From enterprise resource planning that helps organizations manage business to customer relationship management to applications monitored via the Web, data is exponentially increasing all over the globe.

Consisting of billions to trillions of records of millions of entities from consumers to retailers to government agencies, big data is the process of collecting, organizing and analyzing massive amounts of facts and statistics to discover patterns and other useful information. Normal data progresses to big data when it becomes too large and complex for processing by traditional database management tools.

From consumer data tracked by companies to individuals posting content on social media to governmental and military agencies storing highly sensitive information and even the metadata sent from sensors embedded in cars, energy meters and smartphones, big data has become part and parcel of daily living. As a result, the need for cloud computing has become ubiquitous.

"Since big data usually requires huge amounts of computation

and storage resources, the cloud becomes the natural choice for those tasks," said Shi, who is an assistant professor of computer science. "However, cloud infrastructure is usually managed by a third party, which makes security and privacy of the big data processing a big concern, presenting new security challenges."

Without solving this challenge, Shi said, it's hard for some industries to adopt big data technology. While big data has the potential to help companies improve operations and make faster, more intelligent decisions, such as increasing profits or improving operations, the inherent vulnerabilities are a concern and security is the main obstacle to deploying the technology.

Looking at the big picture, Shi says all areas employing big data technology will benefit from their research results. Although the technology his team is developing aims at protecting defense sector big data applications, it also will be applicable to other service providers, such as Google and Amazon. Ultimately, they will be developing a new kind of computing technology that minimizes risks of data breaches by securing the computation itself.

SPS provides funding, expert advice and support to security-relevant research, innovation and knowledge-exchange activities jointly developed by a NATO member and partner country. Shi's project is a joint effort with Korea University. Working with Shi at UH are Lei Xu, a research associate in computer science, and Ph.D. student Kelvin Gao. They will be collaborating with Taeweon Suh, an associate professor in the Department of Computer Science and Engineering at Korea University. Suh is an expert on hardware design and will focus with his team on the engineering part of the project.

- Lisa Merkl

## Guoning Chen: NSF CAREER Award Recipient

“Living in the Age of Information, we are deluged by data,” said Guoning Chen, assistant professor of computer science at UH. “The useful information is typically sparse and hidden in the data. To reveal this information, we need to devise efficient methods to process and interpret this excessive amount of data.”

Chen, whose research focuses on creating techniques to visualize large-scale scientific data, is devising such methods.

Chen was awarded a prestigious National Science Foundation CAREER Award. This five-year award, for \$499,053, covers his research, a portion of which will be integrated into his teaching.

NSF CAREER grants are awarded to promising junior faculty who exemplify the role of teacher-scholars through “outstanding research, excellent education and the integration of education and research.”

Collecting large amounts of data is a common practice these days for researchers working on various scientific and engineering problems. The major hurdle is making sense of these data. One problem is speed: can large amount of data be processed quickly? A second problem is fidelity: can this data be represented in a way that is both accurate and informative?

“The visual channel is the most effective way for a human being to receive information,” Chen said. “People can easily perceive patterns and trends from the visual representation of the data. This is why the field of visualization is so important.”

The visualization methods Chen is creating can be applied to a diverse array of fields as a way of understanding and interpreting large-scale vector-valued data. Areas that can benefit from these

methods include climate study, physics, chemistry, mechanical and civil engineering, oceanography, earthquake engineering, and cardiovascular disease diagnosis.

Chen’s research focuses on developing methods to create visual representations of vector fields so that experts can understand their experimental results and validate their simulation models. In this project, he will be working with data provided by collaborators from mechanical engineering and oceanography.

“One of the reasons this big data problem is so overwhelming is because of the inherent complex behaviors of vector fields that are further complicated with the increase of the dimension,” Chen said. “I am proposing a more effective and practical solution via a hybrid link-graph representation to represent these data.”

Chen will also be devising methods to assess the fidelity and accuracy of the visual representations of vector fields.

“Currently, we have no way to measure the physical authenticity and fidelity of the visualization techniques that are on the market,” Chen said. “Without knowing this, experts will not use these techniques. Part of my research will be developing the metrics to quantify this.”

“Many of the students in my introductory programming course don’t understand the real-world applications of these programming skills,” Chen said. “I plan to integrate a component from my research as a project for this undergraduate course.”

- Rachel Fairbank

## Yun Receives UH Teaching Excellence Award for Instructional Faculty

Chang Yun received the 2015-2016 UH Teaching Excellence Award for Instructional Faculty, one of the highest distinctions bestowed by the University. Yun earned this distinction through his extraordinary level of subject mastery and scholarship, teaching effectiveness, and creativity and personal values that benefit students.

“Dr. Yun developed curriculum for multiple courses, including Interactive Game Development and Game Art and Animation. All of his classes are project-based, which move away from the boundaries of traditional classroom setting. A unique feature of Dr. Yun’s approach is that he emphasizes the overall game development process including programming, art, music, writing and business/entrepreneurship,” stated Dan E. Wells, dean of the College of Natural Sciences and Mathematics, in a letter of support for Yun.

Yun’s unique teaching pedagogy inspires and significantly improves his students’ learning. Students in his classes spend extra hours on their assignments. Through Yun, students experience a motivating and inspiring environment where they can unleash their creative abilities and enthusiasm for learning.

“Throughout the past several years, Chang has demonstrated his endless dedication to helping his students succeed in every way possible,” said Sabah Akbani, UH alumnus, in a letter of support for Yun.

Since 2009, Yun established a sustainable gaming program. The UH gaming program is now considered as the best program in the

Greater Houston area and one of top five programs in Texas.

Yun has successfully mentored over 20 teams into the Microsoft Imagine Cup finals. The Imagine Cup is a technology competition hosted by Microsoft which draws tens of thousands of submissions from around the world in an effort to create software. While no university other than UH succeeded in advancing to the U.S. final for two consecutive years, UH has produced U.S. finalists for six consecutive years without fail. In the 2013 U.S. competition alone, two UH gaming teams advanced as national finalists, while seven UH gaming teams advanced as national semifinalists. Further, UH is the only school that produced a first place winner twice in both 2011 and 2014.

“Dr. Chang Yun is one of the most unique instructors that I have had the pleasure of working with due to his selflessness; he is always thinking and working on what is beneficial for his students and everyone around him,” said Mohammed Alshair, a Ph.D. student in Computer Science.

Yun also provides guidance as a Faculty Advisor to CougarCS, the department’s largest and most active student organization. CougarCS focuses on building a professional and academic network among members based on an interest in Computer Science. CougarCS hosts one of the largest Hackathons in Texas, as well as offering workshops and networking events.

## Distributed Algorithms Meet Big Graph Data



Gopal Pandurangan, associate professor of computer science, and his Distributed Computing and Network Algorithms Research Group are working on advancing the distributed algorithmic foundations of Big Data Computing.

Distributed (network) algorithms have been studied over the last three decades mainly in the context of distributed communication networks (e.g., the Internet, peer-to-peer networks, and ad hoc wireless networks), where they crucially enable fundamental network operations such as broadcast, multicast, routing, search, etc.

At its core, distributed network algorithms are graph algorithms, but there is a big difference in the way these algorithms are modeled, designed and analyzed compared to the centralized setting. Here, each node (which represents a processor in a communication network) computes in a decentralized and localized manner; nodes can also *communicate* with their neighbors by exchanging messages.

Distributed algorithms have been designed for important graph problems such as spanning tree, shortest paths, etc., which are widely used in modern communication networks. In distributed computation, communication is at least as important as computation within a node. In particular, communication between nodes is typically the costly operation and dominates the overall cost of the algorithm.

On the other hand, the emergence of “Big Data” over the last decade has led to many new computing platforms for *distributed* processing of large-scale data, exemplified by MapReduce and Hadoop, and more recently systems such as Pregel, Giraph, GPS, GraphLab, Spark, etc. In these platforms, the data – which is typically too large to fit into a single machine – is distributed across a group of machines that are connected via a communication network, and the machines jointly process the data in a distributed fashion.

One of the main focus areas of Pandurangan’s research group is distributed processing of large-scale *graphs*, which is becoming increasingly important with the rise of massive graphs, such as the Web graph, social networks, biological networks and other graph-structured data, and the consequent need for fast graph algorithms on such large-scale graph data.

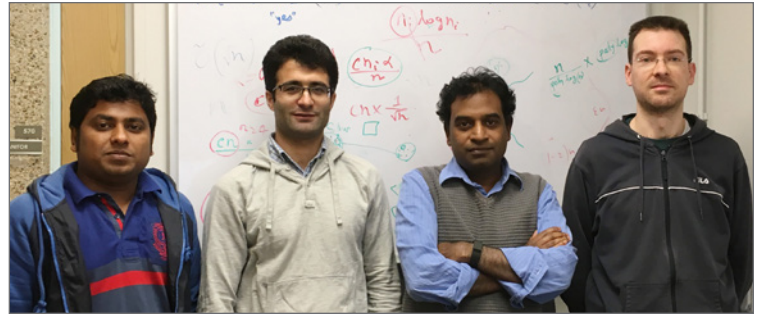
Graphs are useful for modeling relationships in various application domains. The Web graph is an example of a very large-scale graph. It is estimated that the total number of web pages is one trillion; experimental graphs of the World Wide Web have more than 20 billion nodes (indexed pages) and 160 billion edges (hyperlinks). Social network graphs, such as Facebook, now consist of more than a billion users (nodes) and more than 140 billion friendship relationships (edges).

What do distributed algorithms (that have been traditionally used in the context of communication networks) have in common with Big Graph Data? A lot!

A main motivation for Pandurangan’s research is that many recent systems designed for large-scale graph processing, such as Pregel and Giraph, are based on the *message passing* distributed

computation model, much in the same way as traditional distributed algorithms are. In fact, this basic observation was the starting point of Pandurangan’s research that led to the paper titled “Distributed Computation of Large-Scale Graph Problems” which was published in the SODA 2015 conference, the premier conference on algorithms. This paper develops a rigorous theoretical framework for distributed computation of large-scale graph problems. It puts forth the “Big Data” model, which can be used for the design and analysis of distributed algorithms for Big Data problems.

The SODA paper introduces techniques to obtain *communication-efficient* distributed graph algorithms in the Big Data model. It showed how fast algorithms for this model can be designed by leveraging traditional distributed network algorithms. This paper brings the vast research in distributed graph algorithms immediately applicable to the Big Data setting.



A key goal of this paper is quantifying *distributed complexity* of solving graph problems as a function of the *size of the graph* ( $n$ ) and the *number of machines* ( $k$ ) used for the computation. In particular, one would like to understand whether the run time scales linearly (i.e.,  $\sim n/k$ ) or even super-linearly in  $k$ . The SODA paper shows that many problems admit a *linear* scaling.

In a subsequent work with his postdoctoral fellow Michele Squizzato and former postdoctoral fellow Peter Robinson (now faculty at Royal Holloway, U. London), Pandurangan presented even improved algorithms that show that *super-linear scaling is possible* for fundamental graph problems such as connectivity, minimum spanning tree, PageRank, and triangle enumeration.

The Big Data model has been subsequently adopted by other researchers as well. It is now discussed and compared alongside other established models of distributed/parallel computing such as MapReduce, Bulk-Synchronous Parallel model, and the Congested Clique.

Pandurangan expects his group’s research will result in provably good algorithms for various fundamental graph problems; this can have an immediate impact as it can lead to faster algorithms for processing large-scale graph data. The lower bounds will provide insight into the theoretical optimum that can be attained and can serve as benchmarks for algorithm designers.

Besides theory, the focus is also on efficiently implementing the algorithms in a large-scale distributed message-passing system. The efficient implementations of algorithms for various fundamental problems will result in an algorithmic toolkit that can be used as primitives in Big Graph Data applications.

## Pariveda Solutions: Be Part of Our Story



In 2003, we asked one simple question. Can a technology consulting firm be successful by focusing first on growing the individual to their fullest potential? At our very core, we desire to help the individual grow through learning, coaching and giving to others to achieve their fullest potential. The individual is defined as our people, our clients, recruits, alumni and our

communities. We do this in many different ways.

For our clients, Pariveda solves the complex problems of companies ranging from Fortune 100 to Global 2000 to startup companies and spanning multiple industries. We provide strategic consulting services and custom application development solutions for mobility, cloud computing, data, portals and collaboration, CRM, custom software, enterprise integration and user experience needs of our clients. Our people develop trusted relationships with clients based on the value we provide them. Clients partner with us for our high-caliber combination of technology and business problem-solving experts, our high-quality delivery consistency and our focus on building lifetime relationships. That is why we have high percentage of repeat business at 85 percent.

We pride ourselves on our ability to collaborate alongside our clients to achieve successful outcomes. We remain focused on producing solutions which are sustainable whether you choose to enhance internally or ask Pariveda to do so.

One way we help our recruits grow is through our internship program. Every year, we take the best and brightest college students and partner with a local non-profit for 11 weeks in the summer. This gives the students the opportunity to learn new exciting technologies that ultimately make an impact in the local community. It gives us the opportunity to introduce them to the world of consulting and to demonstrate how community service is built into the core of this company.

While the technologies will flux and change over time, our product is our people and that stays consistent. We leverage a proprietary Expectations Framework (EF) to guide the career development of our employees. The EF maps our expectations across five core dimensions (Effectiveness, Business of IT, Relationships, Leadership and Others First). This creates a clear framework for coaching our employees to achieve their maximum potential through rigorous development.

We believe in the efficiency of small teams working together to solve complex problems leveraging strategy and technology. We believe in growing deep relationships with our people, our clients and others in our networks. Our people develop trusted relationships

with clients because of the value we provide them. Value realized is evidenced through a client repeat/referral rate of 85 percent. We are unwavering in our commitment to excellence and growing individuals to their fullest potential.

We develop our people who are high-potential consultants into solution architects to solve global business problems. Our solution architects, because of their growth experiences using a variety of frameworks and technologies, create highly effective solutions to our clients' most difficult problems. Pariveda embraces a broad range of technologies, offering both the chance to excel in many areas and the challenges of ramping up quickly when thrust into a situation with an unfamiliar stack. The diversity of the technologies we work with at Pariveda drives many aspects of the business from sales to recruiting. We take pride in knowing that, regardless of which technology stack our clients employ, our Fins will be prepared for the task.

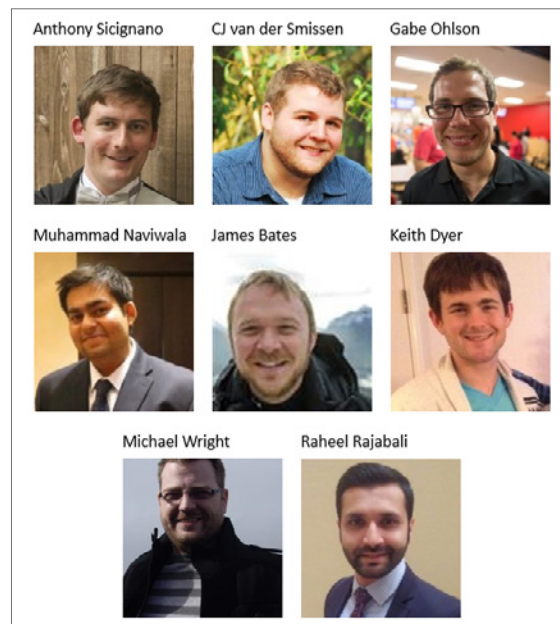
For illustration purposes, here are a few technologies we've used in the last year at our client sites: C#/.Net, Java, Python, C++, Bash, Oracle, Sybase, Microsoft Business Intelligence, Hadoop, Microsoft Azure HDInsight, Sitecore CMS, WordPress, Scala, Akka, JavaScript (including jQuery, Backbone, and Angular), Ionic, Titanium, and Xamarin, along with all of the supporting players that enable things like dependency injection, continuous integration, dependency management, source control and unit testing.

Exposure to such an extensive cross-section of technologies enables our Fins to stay on the learning edge during their career advancement and provides them with the vocabulary and concepts to communicate ideas effectively in a variety of scenarios. This is an excellent example of one of the strengths of the Pariveda internal network. When something new is

encountered, there is usually someone who has used the technology before and is able to provide a vast knowledge base, thereby reducing the ramp-up cost. To us, this is growing the Fin to their fullest potential by introducing them to the technology and growing leaders who then can teach it back within with the company.

It is through this belief in helping the individual, counter to industry norms, we have grown revenue each year since 2003. We believe in providing for the security and well-being of our people and their families through an ESOP where stock is earned from the first day of work, 401k match, paid sabbaticals and 100% paid medical. We employ a cohort model for compensation in order to foster collaboration across our employees. All employees at a certain level are paid the same so that no individual focuses on their own credit but rather the success of the collective firm.

Please reach out to us if this sounds like something you want to be a part of and are curious how to jumpstart your career. Look for us at your next career fair.



## HackDFW 2016 – CS Team Develops Sensitive Motorbike

HackDFW is the design-thinking hackathon of Dallas. It is a place where you can be part of the nebulous, wondrous, awe-inspiring, frustrating-yet-glorious process of creating. It is also a place where ideas aren't limited by fear or doubt, just 24 hours.

A team of five Ph.D. students from the UH computer sciences department participated in HackDFW and ranked in top 14, out of 117 submitted ideas. All the UH team members won internship positions at Touch Titans, the event sponsor.

The UH team focused on enhancing the virtual reality experience especially in game environments. Although still perhaps not the ultimate solution, gamepads are the most popular traditional controller at this time for virtual reality environments. The user can grip the gamepad with both hands and isn't bound to ergonomic factors of using a more complicated control device on a desktop.

Though the team believes gamepads are preferable over keyboard and mouse input, they emphasize that neither input method is

ideal for VR. Research is under way at Oculus to find innovative and intuitive ways of interacting with a wide breadth of VR content.

The UH students used Flex and Pressure sensors to build new controllers for their VR application. They developed a motorbike which can be controlled by the user's body. The ultimate goal is to capture body and environment information through sensors and reflect that interpretation into the virtual reality environment.

### Team Members

Milad Heydariaan (Prof. Omprakash Gnawali)  
Hessam Mohammadmoradi ( Prof. Omprakash Gnawali)  
Yaser Karbaschi (Prof. Shishir Shah)  
Millad Ghane (Prof. Barbara Chapman)  
Reza Fathi (Prof. Gopal Pandurangan)

## Spotlight on Student Research: 2016 Ph.D. Showcase

In April, students, faculty and guests gathered at the M.D. Anderson Library's Rockwell Pavilion to hear about the current research of Computer Science Ph.D. students. The event began with welcoming remarks from Shishir Shah, associate chair of the Department of Computer Science.

Throughout the afternoon, 31 computer science Ph.D. students shared highlights of their posters. Through one-on-one discussions, the students guided judges, faculty and guests through an in-depth explanation of their poster and research.

"It was fun to interact with other CS Ph.D. students and faculty. It is a constructive way to get feedback and learn more about the department," said Dinesh Majeti, a Ph.D. student.

The Ph.D. Showcase is an annual departmental event to showcase the research of our Ph.D. students, giving them the opportunity to demonstrate their research, receive feedback and exchange information. This academic exchange supports research in the computer science community.

### Poster Presentation Awards

#### First Place

Xifeng Gao – Parameterization-based Structure Simplification for Hex Re-meshing

#### Second Place

Pengfei Dou – Pose-Robust Face Signature for Multi-View Face Recognition

#### Third Place

Ashik Khatri – Effects of Simple Personalized Goals on the Usage of a Physical Activity App

## Celebrating Student Success: Spring 2016 Graduation Luncheon

The Department of Computer Science celebrated the accomplishments of over 139 Bachelor's, 48 master's, and 14 Ph.D. students graduating in summer 2015, fall 2015 and spring 2016 semesters.

"The Department of Computer Science Graduation Luncheon provided an opportunity for us to meet and mingle with CS graduates, alumni, faculty and staff," said Alicia Gantt, a graduating computer science student.

Highlighting student success, Dan Wells, Dean of the College of Natural Sciences and Mathematics, congratulated the students. Jaspal Subhlok, chair of the Department of Computer Science also commended the hard work and accomplishments of the graduating

students. Citing higher salaries for graduating students, Shishir Shah, associate chair of the Department of Computer Science, congratulated students on choosing the right major. Computer Science alumni Michael Slater and Michael Wright invited recent graduates to join the CS alumni network. Nouhad Rizk, Director of Undergraduate Studies, congratulated all graduating students and acknowledged all graduates participating in the luncheon.

"This academic achievement has opened many doors of challenges; I will always appreciate it and take it as a precious background for my further career," said Jay Shah, a graduating computer science student.

# AWARDS

## Student and Faculty Awards – Spring/Summer 2016

### UH Computer Science Ph.D. Showcase – Poster Presentation

#### Winners

- **First Place** Xifeng Gao
- **Second Place** Fengfei Dou
- **Third Place** Ashik Khatri

### International Conference on Intelligent Text Processing and Computational Linguistics – Best Paper Awards

- Arjun Mukherjee, Rakesh Verma, Vasanthi Vuppuluri, An Nguyen, Arjun Mukherjee, Ghita Mammari, Reed Armstrong and Shahryar Baki

### National Science Foundation CAREER Award

- Guoning Chen

### UH Teaching Excellence Awards

- Chang Yun

### UH College of Natural Sciences and Mathematics Junior Faculty Research Award

- Guoning Chen

## Spring/Summer 2015 Graduates

### B.S.

Matthew Allen  
Adrian Arevalo  
Erik Avellaneda  
Steven Avila  
Marden Benoit  
Aartiben Bhasker  
Thien Dinh Ngo  
Lance Gaeth  
Chirag Ghanshani  
Daniel Gonzalez  
Nestor Gonzalez  
Jiean He  
Ana Hernandez  
William Hornback  
Johnathan Hornik  
Dawn Hughes  
Dang Huynh  
Rahim Jiwani  
Jared Jones  
Nicholas Kaminski  
Mario Laiseca-Ruiz  
Truc Le  
Jason Li  
Christopher Ly  
Tahmid Mahmud  
Larry Martinez  
Miguel Medina

Duc Nguyen  
Luan Ba Nguyen  
Tri Nguyen  
Trung Nguyen  
William Nguyen  
Dhaval Patel  
Viraj Patel  
Menglong Piao  
Christopher Robinson  
Jarrod Rodgeron  
Ryan Rodriguez  
Carlos Salazar Fuentes  
Jay Shah  
Hector Silva  
Alicia Smith-Gantt  
Marvin Thai  
Linh Tong  
Aileen Tran  
Linh Ty  
Obinna Ugwuzor  
Chad Van Roekel  
Morgan Vegsund  
Ryan Wedge  
Huanglin Wu  
David Ysmael  
Shah Zaib  
Amulya Dadi

### M.S.

Amulya Dadi  
Shiyao Ge (w/thesis)  
Zhiguan Hu  
Kunal Jagdishbhai Parmar (w/thesis)  
Rohith Jidagam (w/thesis)  
Pegah Khosravi  
Abhishek Koluguri  
Nikitha Kotha  
Krishna Kumar Kristamshetty  
Renuka Pampana (w/thesis)  
Aishwarya Panchanatheeswaran  
Pramey Prakash Patil  
Anjani Swetha Settipalli  
Madhur Thangadurai Rajendran (w/thesis)  
Mayur Thangadurai Rajendran (w/thesis)  
Xi Wang (w/thesis)  
Yiqun Zhang (w/thesis)

### Ph.D.

Junmo An  
Youcef Barigou  
Xifeng Gao  
Ming Chih Shih  
Cheng Wang  
Rengan Xu

# CONTACT

## Sponsors



## Submit News

Please submit Alumni News to [csnow@cs.uh.edu](mailto:csnow@cs.uh.edu).

For information on upcoming alumni events, join the **Computer Science at University of Houston** group on LinkedIn.

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