It is my privilege to present to you the 2018 edition of the Cyber Cowboys Newsletter. The newsletter highlights the activities of the Department of Computer Science. The faculty has decided to change the name of the Department from "Computer Science Department" to "Department of Computer Science". This is consistent with how all the other departments in the College of Arts and Sciences are named.

The department had a good year in terms of enrollment and external funding. The following are the highlights:

1. Students and curriculum: The Department had 244 undergraduate majors, 47 masters students and 15 PhD students enrolled during Fall 2018. The Department was able to award merit based scholarships to several students. The Department has initiated the process to apply for the ABET accreditation. Request has been submitted for approval to offer an online BS degree program in Computer Science. The ACM student chapter continues to be very active. The undergraduate advisor MS. Cara Brun and our new faculty member Dr. Esra Akbas are leading the effort to establish an ACM-W group.

2. Faculty activities: During FY 2018, the Computer Science faculty collectively submitted more than 20 proposals for approximately $9M. Several projects received funding from NSF and private industries. The faculty published several peer reviewed papers and made presentations at numerous conferences. Dr. J. Cecil is leading the cyber manufacturing research activities while Dr.Chris Crick is leading the robotics and machine learning research thrusts. During the summer 2018, we conducted two NSF supported REU sites.

3. Faculty changes: Drs. Eric Chan-Tin and David Cline left the Department. Dr. M. H. Samadzadeh retired. Two new faculty members, Drs. Esra Akbas and Wei Zhang joined the Department.

I am happy to report that our Department is growing and we look forward to connecting with you in the coming year.

Best Regards,

K. M. George
Professor & Head
Computer Science Department
Avinash Gupta is pursuing a PhD degree in Computer Science in our department. He completed his Bachelors in Industrial Engineering from Tribhuvan University, Nepal and Masters in Product Design and Manufacturing from Visvesvaraya Technological University, India. He research interests include Virtual Reality, Information Modeling and Internet of Things. He is currently working as a Graduate Research Assistant for Dr. Cecil on a project which focuses on creation of Network based Collaborative Simulation Environments for Orthopedic Surgical Training. This project involves the use of emerging VR technologies such as Vive, HoloLens, Leapmotion among others which he enjoys working with. The cutting edge research being conducted in the Computer Science department inspires him to strive for bigger and more challenging goals. He also feels that the best thing about the department is the helpful and caring nature of the people here.

COMMENCEMENT CHEER

Congrats, Graduates!
Our Department’s Distinguished Alumni Award Winner for this year is Joe Carroll.

Carroll is the Manager of Technology Services at CITGO Petroleum. Joe has over 32 years of IT experience supporting the Oil and Gas Industry. Joe has worked in various IT roles which include Applications Development, Technical Infrastructure, Hydrocarbon Supply Chain Applications and IT Management. Joe has managed application teams that support the Finance, HR, Hydrocarbon Supply Chain, Mid-Office, Marketing and various other business units. Joe is on the Sr. IT Leadership team and participates in the PMO, Strategic Planning, IT Budget Planning and Preparation, Vendor Management and Compliance with IT General Controls.

Joe is a Member of the Computer Science Academic Advisory Board for Oklahoma State University, a Board Member of the Gutierrez Energy Management Institute (GEMI) at the University of Houston's C.T. Bauer College of Business. Joe serves as the ASUG Community Chair for the Oil & Gas Special Interest Group and is a member of The Houston Chapter for the Society of Information Management. Joe holds a Bachelor of Science in Computer Science from Oklahoma State University and a MBA from the C.T. Bauer College of Business at the University of Houston.

Welcome Dr. Akbas!

This fall, Dr. Esra Akbas joined the Oklahoma State University Department of Computer Science. She completed her masters degree at Bilkent University in Turkey, and her doctoral degree at Florida State University, Tallahassee. Her areas of research are data mining and machine learning using large-scale datasets, specifically within graph mining and social network analysis and applied machine learning. We welcome her to our department, and look forward to working with her.
Developing and Mining Attributed Multi-Level Sentient Document Graphs for Factual Data

In this project, Dr. Akbas is collaborating with a researcher from the University of Alabama in Huntsville to develop an attributed hierarchical sentient document graph for factual data. Using graph queries, behavior to sentient documents can be added to refute or affirm the truth of statements for factual data.

Fingerprint Identification with Graph Matching

In this research, Dr. Akbas is working with colleagues from University of Central Oklahoma and Purdue University to develop a new method of identification using graph representation of fingerprints, which includes considering patterns, pores and other other unlabeled, uncategorized topological features.

CLOUDMAP: Collaboration Leading Operational UAS Development for Meteorology and Atmospheric Physics

Dr. Crick’s students spent a week in Colorado this summer as part of a multi-university flight campaign that collected hundreds of hours of meteorological data to study thunderstorm formation and other severe weather phenomena. His lab develops artificially intelligent coordination and planning techniques so that many autonomous robots can work together to search and survey a large volume of airspace. They decide where to go and where they are likely to find interesting data based on real-time sensor readings, both their own and those that other robots have told them about.

Additionally, Andrew Bevelhymer, one of the undergraduates who worked in the CS department over the summer as part of Dr Crick's NSF-funded Research Experiences for Undergraduates (REU) program, was invited to present his work at the annual conference of the Council on Undergraduate Research in Washington, DC.
Interactions with NASA as part of innovative learning activities

Students in a new course taught by Dr. Cecil entitled ‘Modeling of Cyber-Physical Systems’ interacted with NASA Johnson Space Center engineers as part of class project activities. Working in teams, the interdisciplinary students (including both undergraduate and graduate students from electrical, computer engineering and computer science programs) designed 3D virtual reality mock-ups to support the study of transportation and habitat designs for astronauts to live on the moon. The activities culminated in students visiting Johnson Space Center, Houston to present their 3D designs to NASA engineers. Asher Lieberman (Deputy Branch Chief, Dynamic Systems Test Branch) coordinated the interactions for NASA. JSC (Houston). Undergraduate students played a key role in developing initial simulation environments studying assembly of habitats using robots on the moon surface. Some of the students were co-authors in a resulting paper which was presented at the 2018 IEEE Systems Man Cybernetics Conference held in Miyazaki, Japan in October 2018.

Hacklahoma 2018

This group of Computer Science Students attended the inaugural Hacklahoma hackathon in February 2018. It is hosted at the University of Oklahoma, Norman. The 24-hour event allows participants to collaborate, build, and share projects with other university students from across the nation. It provides a comfortable learning environment for all hackers to use their creativity and innovation at its full potential.

OUR DEPARTMENT’S INDUSTRIAL ADVISORY BOARD MEMBERS

We thank our Industrial Advisory Board (IAB) members for supporting our department in its planning activities.

Jacob Boyer, The Boeing Company
Joe Carroll, CITGO Petroleum Corporation
Michael Hanska, Cerner
Todd Pugh, SST Software

Kurt R. Schmeckpeper, Motorola Solutions
Geoffrey Simpson, SpikedMace.com
Daniel Summers, EXXONMobil
Dan Yost, Tri-8 Inc.
Thank you for your generosity

We are thankful for our alumni and sponsors for donating to our department. Their donations help the Department of Computer Science programs that are critical to the success of graduate as well as undergraduate education, which (among other things) improve the quality of departmental research, some of which is presented in this very newsletter. Their generosity increases the chances of our students in fully realizing their potential. Consider supporting the Department of Computer Science through OSUGiving, or learn more on our website: cs.okstate.edu/giving.html.

Creative Components

Our graduate students participated in an inaugural poster presentation activity held in December 2018 based on their creative component work as part of their graduation requirements.

US IGNITE: A gigabit network and Cyber-Physical framework for Advanced Manufacturing

In this NSF Cyber Manufacturing project, Dr. Cecil and his students are Building one of the first comprehensive Internet-of-Things (IoT) based cyber physical test bed based on Industry 4.0 principles. The manufacturing domain involves assembly of micron sized devices using distributed cyber and physical resources linked through next generation networking approaches based on Software Defined Networking (SDN) and cloud technologies. Several key milestones have been achieved by this project including demonstrating the feasibility of such emerging SDN principles to support 3D Virtual Reality based simulation interactions among distributed engineers.
Creation of Simulation based Training Environments for Orthopedic Surgery

Dr. Cecil and his research team are continuing to work with orthopedic surgeons to build Virtual Reality based simulators for training medical residents. The training simulators have been built using haptic, VR and mixed reality platforms. Recently, the team visited surgeons and residents at Mountain View Regional Medical Center, Las Cruces (New Mexico) where they interacted with residents who used these simulators and provided feedback on the content and user interface of the simulators.

Creation of a Shape Modification App to support cyber manufacturing approaches involving 3D printing

The emergence of 3D Printing as well as IoT and Cloud technologies are transforming the manufacturing practices worldwide. As part of an NSF project in cyber manufacturing, Dr. Cecil is exploring the design of a cloud-based IoT framework to support 3D Printing activities. At the center of this approach is the design of a 3D Shape Modification App (for Android platforms) which can run on smart phones; the general idea is based on the recognition of the fact that most designs today are variations of existing designs. The overall process being explored is that once a part design has been modified to the satisfaction of a user (who can be anyone, not necessarily an engineer), the next step would involve retrieving a similar design on the web or other cloud based data bases. This can be achieved using existing shape retrieval tools; subsequently, additional modifications to the design can be completed if necessary. The final step would be to manufacture the modified design using cloud based interfaces supporting 3D printers located at distributed sites.

See the rest of our faculty’s research projects and teaching interests:

cs.okstate.edu/faculty.html
Congratulations to Jenna Coons (left) for winning the Sharon L. Daniel Scholarship for Computer Science for the 2018-2019 academic year.

Congratulations to Samuel Wood (right) for winning the Computer Science Endowed Scholarship for the 2018-2019 academic year.

Congratulations to Brayden Dyke (pictured), Seongsoo Kim, Rachel Higgins, and Pil Park for securing a scholarship from Devon Energy in the area of Computer Science for the 2017-2018 academic year.

Congratulations also to Jenna Coons, Samuel Wood, Alexander McCoy, and Brandon Wong for securing a scholarship from Devon Energy in the area of Computer Science for the Spring 2018 semester.

Congratulations to Holly Long for securing a scholarship from ConocoPhillips in the area of Computer Science.
Recently Published Papers

*Refereed Journal Papers*


*Refereed Conference Papers*


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