Association for Computer Educators in Texas

Computer Education during the pandemic
Lessons learned
and designing ways to create a new normal

Promoting Computer Education and Research in Texas

56th Annual Conference

ACET 2021 Conference Schedule

Topic: ACET - 2021 Conference
Time: Oct 28, 2021 09:30 AM Central Time (US and Canada)

Join Zoom Meeting - https://zoom.us/j/96971636281

Time	Function	Presenter	Topic
09:30-10:30	Keynoter	MS. Melinda Doty	Top Tips for Motivating Students
10:30-10:50		Dr. Peter M. Maurer	Teaching Computer Science in a Locked-Down World
10:50-11:00	Short Break		
11:00-11:20		Drs. Daxton Givan, Noah Hanshaw, & Heejun Choi	Building a Self-Driving Car with Object Detection using Raspberry PI
11:20-11:30	Short Break		
11:30-11:50		Dr. William Booth	Testing During the Pandemic – Mastery Test Framework
12:00-01:00	Virtual Lunch		
01:00-01:20		Drs. Devon Boyda, Surya Karki and Heejun Choi	Building Big data cluster for doing class hands-on practice and research project
01:20-01:30	Short Break		
01:30-01:50		Dr. Stefan Andrei	Considerations about a new Task Model with Two Deadlines for Scheduling Real-Time Systems on a Multiprocessor Platform
01:50-02:00	Short Break		
02:00-02:20		Prof. Shohreh Hashemi	MIS 1305 – A Field of Study Course for the First Year Business Computer Application.
02:20-02:30	Short Break		
02:30-02:50		Samar Ashour & Dr. Sam Hijazi	Distance Learning: Response to the New Corona Virus
02:50-03:00	Short Break		
03:00-03:20			Upcoming Presentation
03:20-03:30	Short break		
03:30-03:50	Students	John Person, Ty Edwards, Ridwan Noel	Investigation of different forecasting techniques in predicting stock market behavior

Presentations

Keynote Address

"Top Tips for Motivating Students"

MS. Melinda Doty

Teaching Computer Science in a Locked-Down World

Peter M. Maurer Ph.D. - Baylor University

Over the last year and a half, we have had online instruction dropped in our laps with hardly a clue how to proceed. Most of us have found solutions to the problem, although our solutions differ, sometimes widely, from one another. I am sharing my experiences to give at least one approach to the problem. By combining our experiences, we can find reasonable solutions to online instruction for the future.

Building a Self-Driving Car with Object Detection using Raspberry PI

Daxton Givan - University of Mary Hardin-Baylor
Noah Hanshaw - University of Mary Hardin-Baylor
Dr. Heejun Choi - University of Mary Hardin-Baylor

Using a Raspberry Pi board, our research was focused on the deep learning aspect of a self-driving car. The board was mounted to a plastic frame and connected to an RC drivetrain. We referred to open-source code specifically designed for our drivetrain. After setup, we collected data of the car being manually driven in a lane and created a deep-learning model using this data. This process was repeated several times in order to train a more accurate car. Once we had a finalized model, object detection was implemented in order for the car to recognize various objects in and around

the lane, such as stop signs and pedestrians. Finally, we discuss additional peripherals that will be researched and implemented in the future.

Testing During the Pandemic – Mastery Test Framework

William A. Booth, Ph.D. - Baylor University

One of the challenges of teaching during the pandemic was administering exam in a secure environment. The technology used by the University was easily defeated. So an alternative was needed. The Mastery-Test Framework provides yet another tool for conducting assessment that is more resilient to student cheating.

Building Big data cluster for doing class hands-on practice and research project

Devon Boyda - University of Mary Hardin-Baylor
Surya Karki- University of Mary Hardin-Baylor
Dr. Heejun Choi - University of Mary Hardin-Baylor

Big data is becoming more popular as time goes on and various fields have discovered how to use this information to their benefit. Through this project, students have created a Cloud Computing cluster that is used for class hands-on practice and research. The project has been conducted with 5 old servers by 3 students during the summer period and has integrated various networking and big data technologies into a big data infrastructure, called CruCloud. The Big data cluster will be accessed remotely through VPN server from students' home computers. It is expected that the Big data

cluster would be a valuable computing resource for students to learn Big data software (Hadoop, Hive, Spark, etc.) and complete research regarding Big data analytics.

Considerations about a new Task Model with Two Deadlines for Scheduling Real-Time Systems on a Multiprocessor Platform

Dr. Stefan Andrei - Lamar University
Dr. Albert M.K. Cheng - University of Houston
Dr. Vlad Radulescu - A. I. Cuza University of Iasi

There have been many task designs for modelling real-time embedded systems in order to capture real-world problems. The traditional approach is when each task has a hard deadline, so all tasks are equally treated when considering the scheduling problem. A recent design is for a task set to have (m, k)-firm deadlines, namely at least m out of any k consecutive tasks must meet their deadlines. Another related model may be defined when a task is allowed to execute in multiple feasible intervals. Other existing models are represented by soft real-time (SRT) systems, but do not require any deadline to be met. Instead SRT systems require bounded tardiness, where jobs are allowed to miss deadlines if the miss's extent is bounded.

This paper describes a new task model, similar yet different from all previous existing models, for scheduling single-instance non-preemptive tasks on a multiprocessor platform by considering both a soft and a hard deadline for each task in a given task set. Our motivation is that tasks that finish before their soft deadlines achieve their best performance. Finishing before the hard deadline implies an acceptable and a safe performance, while missing a hard deadline leads to harmful situations. In addition, our paper defines a measure for the feasibility of a task set, where meeting a soft deadline counts twice as much as meeting just a hard deadline of that task. This paper also describes a scheduling algorithm for

soft-hard single-instance non-preemptive tasks together with some examples reaching a feasible schedule.

MIS 1305 – A Field of Study Course for the First Year Business Computer Application.

Prof. Shohreh Hashemi - University of Houston Downtown

For years and in many instances, students transferring from one institution of higher education to another were not given credit towards their degree program for courses they had completed and were compelled to retake those courses even if the courses were similar or identical. To ensure transferability of courses and streamlining degree programs across public institutions of higher education in the State of Texas, the Texas Higher Education Coordinating Board (THECB) with the help of an advisory committee mainly composed of faculty representatives from across disciplines at various institutions of higher education established the Field of Study (FOS) curricula for lower-division courses and mandated that effective September 2020, all Texas public institutions of higher education include FOS courses in their degree programs (Education Code Chapter 61, Section 823). The THECB mandate FOS curriculum for Business Administration and Management degree programs identified 24 SCH of FOS including a 3 SCH Business Computer Applications course. The business FOS course description includes familiarizing first-year business students with computer concepts and business productivity tools and Internet. and the nine Learning Outcomes (LOs) of the course focus on students' ability to describe computer hardware, software, security, and privacy; understand file management techniques, skillfully use productivity tools including word processing, spreadsheets, multimedia presentation, and databases; use Internet; and conduct research.

This presentation reviews MIS 1305, a freshman business FOS

course that meets THECB business computer application course description and learning objectives. Furthermore, it will review and discuss the course syllabus and assignments utilized for learning outcome assessment.

Distance Learning: Response to the New Corona Virus

Samar Ashour &
Dr. Sam Hijazi - Texas Lutherane University

It has been over ten years of unsettled war in Syria. Hope diminished in my ways, but it also emerged in many other helpful ways. During this challenging time, a need has arisen to cope with learning and teaching over distance. What added more difficulties to the situation was the arrival of COVID-19 to a country that has had beyond its share of problems. A local presenter, who lives in Syria, has worked closely with a United States professor who has his roots in Syria. Both applied the available technologies, mostly free, to communicate with various students in Syria. Also, both presenters have maintained productive communication through varieties of communication tools. This presentation should bring the hope that regardless of the challenges we face, even in the magnitude of war, we, as educators and irrespective of the place and time, can still produce a positive outcome for learning and teaching.

Incorporating Critical Thinking, Communication, and Teamwork in Introductory Computer Courses

Prof. Shohreh Hashemi - University of Houston Downtown

Today's students will join an everchanging work environment that needs employees who are effective communicators working in teams to solve problems. For more than a decade, studies have shown that critical thinking, problem solving, teamwork, and communication skills are the most sought-after skills for employment .

To further prepare students for careers and for life, the Texas Higher Education Coordinating Board (THECB) developed six core curriculum objectives for the core curriculum foundation courses focusing on lifelong skills . The six core curriculum objectives are identified as 1) Critical Thinking (CT) skills, 2) Communication (COM) skills, 3) Teamwork (TW), 4) Empirical and Quantitative skills (EQS), 5) Personal Responsibility (PR), and 6) Social Responsibility (SR) . Furthermore, THECB mandated that core curriculum foundation courses must include three or four, out of six, core curriculum objectives .

Considering the abovementioned, a sophomore course in the communication thread of a foundation course in the core curriculum was revised to include course topics and assignments that focus on three of the six core objectives -- critical thinking, communication, and teamwork. In addition to other course contents such as principles of communication, computer technology and Internet, cyberspace, cybersecurity, and alike; critical thinking theories and problem-solving processes; ethical research methodologies; written, oral and visual communication techniques and technologies; and team dynamics elements and practices were included in the course. To further expand students' understanding of these core objectives, two major assignments were added to the course.

This article describes a sophomore Communication in Cyberspace course, its purpose, objectives and learning outcomes, course contents and assignments including two assignments that focus on three of the six core curriculum objectives – Critical Thinking (CT) and problem-solving skills; oral, visual, and written Communication (COM) skills; and Teamwork (TW).

The first assignment is designed to provide individual students an opportunity to conduct brief research on an IT-related controversial topic, gather and analyze information about the subject matter, and report their research findings in the form of a written report. The second assignment is designed as a teamwork effort with teams of three students who are required to study each other's research reports, discuss commonalities and differences between their research findings, choose and expand on the top three issues, propose ways to address these issues, develop a visual group presentation, and orally present the result of their teamwork.

1. https://peer.asee.org/critical-thinking-communications-and-teamwork
2. http://www.thecb.state.tx.us/DocID/pdf/2836.pdf
3. http://leaptx.org/coreobjectives/
4. https://reportcenter.highered.texas.gov/agency-publication/miscellaneous/elements-of-the-texas-core-curriculum/

Lessons from Three Years of Summer International Research Experience Internships

Dr. Tomas Cerny - Baylor University
Dr. William A. Booth - Baylor University

Teaching students to perform research is a challenging task, especially when expecting individual outcomes. However, it would be a flaw to think teamwork is of the context. Team collaboration brings motivation to individuals to overcome challenges that individuals may face. In our case, it significantly helped to design teams combining more and less research-skilled members such as graduate students leading a team of undergraduates serving as

role models. However, where to start to teach students to become researchers? Our main ingrediency for such an aim is to assess the state of art and study related literature through systematic literature reviews and research mapping studies. This has a multifold benefit. Students learn to work with scientific literature, use indexing sites to identify related work, and observe outstanding papers from others. Reading through articles helps them to understand expectations from successful research. However, when the team is well managed, study outcomes can result in first-team publication and help narrow consequent research focus on what are solved problems, the tools, and which directions are not worth going. With such research background assessed, students are ready to start their individual research experiments and write their results and observations in a form easy to transform into a research publication. While our practice, activities, and what can be called case studies are in computer science, we believe that the observed outcome and best practice are generally applicable across disciplines. Besides, our observation stems from internships' online format, which might have been overlooked otherwise in face-to-face practice.

List of Presenters

Dr. Stefan Andrei

Dr. Stefan Andrei graduated PhD from Hamburg University, Germany, in 2000 as a World Bank Scholarship Japan Graduate student. He was a recipient of a postdoctoral fellowship from Singapore-MIT Alliance between 2002 and 2005. He is currently a Professor and the Chair of Department of Computer Science with Lamar University.

His research interests include real-time embedded systems and software engineering. He has more than 23 years teaching courses such as, real-time embedded systems, software engineering, foundations of computer science, computer law and ethics, and programming languages. Stefan has been on the Program Committee for more than 50 prestigious conferences. He was invited as a Speaker at several universities and private organizations. He has already been a co-author of more than 100 peer reviewed papers at international reputable journals and conferences. Among his main contributions, he proved the problem of incremental counting satisfiability and invented the LRTL (Linear Real-Time Logic) useful for verification of real-time embedded systems specifications.

His research got more than 3600 non-self scientific citations. He was and is involved as a PI, co-PI, or Senior Personnel in more than 14 funded research projects. He is a Senior Member of the ACM and an IEEE Member. More details about Stefan may be found at the address: cs.lamar.edu

William (Bill) A. Booth, Ph.D.

Dr. William (Bill) A. Booth is a Senior Lecturer in the Department of Computer Science at Baylor University. He earned a BS in secondary education from Texas A&M university in 1986. After teaching in the Texas public school system for six years he returned to school in 1992. In 1994 Dr. Booth earned a MS in

Computer Science from Baylor University. He worked for six years as a programmer analysis at Baylor before becoming a full time member of the faculty in 2000. In 2013 Dr. Booth earned a Ph.D. in Educational Psychology from Baylor. His current area of research includes the pedagogy of computer science and computational thinking.

Devon Boyda

Devon Boyda is an undergraduate student in Computer Science, Engineering and Physics department at the University of Mary Hardin-Baylor.

Dr. Tomas Cerny

Tomas Cerny is a Professor of Computer Science at Baylor University. His area of research is software engineering, code analysis, security, and enterprise application design. He received his Master's, and Ph.D. degrees from the Faculty of Electrical Engineering at the Czech Technical University in Prague, and an M.S. degree from Baylor University. From 2009 to 2017, he was an Assistant Professor of Computer Science at the Czech Technical University, FEE, Prague, Czech Republic. In 2017, he was a PostDoc at Baylor University, Texas, USA, and from the same year, he continues as Assistant Professor with a concentration on Software Engineering. Dr. Cerny served 10+ years as the lead developer of the International Collegiate Programming Contest Management System. He authored over 100 publications mostly related to code analysis and aspect-oriented programming. Among his awards is the Outstanding Service Award ACM SIGAPP 2018 and 2015 or the 2011 ICPC Joseph S. DeBlasi Outstanding Contribution Award. In the past few years, he chaired multiple conferences including ACM SAC, ACM RACS, or ICITCS. Furthermore, he led special issues and track at these conferences and selected journals.

Dr. Heejun Choi

Heejun Choi is an Associate Professor of Computer Science, Engineering and Physics department at the University of Mary Hardin-Baylor. He holds a Ph.D. in Computer Science and Engineering from the University of Louisville. He also holds an MS in Information Technology from Pohang University of Science and Technology, in Pohang, Korea and a BS in Computer Science from Air Force Academy in Cheongwon, South Korea. His research interests are in Big data, Machine learning and Cybersecurity.

Daxton Givan

Daxton Givan is an undergraduate student in Computer Science, Engineering and Physics department at the University of Mary Hardin-Baylor.

Noah Hanshaw

Noah Hanshaw is an undergraduate student in Computer Science, Engineering and Physics department at the University of Mary Hardin-Baylor.

Shohreh Hashemi

Shohreh Hashemi is an Associate Professor and Martel Professor of Management Information Systems at the University of Houston Downtown (UHD), Houston, Texas, where she teaches both upper- and lower-level MIS courses in face-to-face, hybrid, and online modes. Her research interest is now focused on student retention and success. She is the A+CE faculty champion for the Davies College of Business (DCOB). Professor Hashemi is the recipient of the UHD Excellence in Teaching Award, and twice recipient of the UHD Excellence in Service Award.

Dr. Sam Hijazi

Dr. Sam Hijazi has been a member of ACET since the year 2009. He has taught in FL Keys for 15 years before moving to Texas Lutheran University in 2008.

Surya Karki

Surya Karki is an undergraduate student in Computer Science, Engineering and Physics department at the University of Mary Hardin-Baylor.

Dr. Peter M. Maurer

Peter M. Maurer is a professor of computer science at Baylor University in Waco, Texas. He obtained his M.S. and Ph.D. at Iowa State University in 1979 and 1982. He obtained his BA at St. Benedict's College in 1969. He has taught at Baylor for nearly 20 years. Before joining Baylor in 2002, he taught at the University of South Florida for 15 years. Before joining the University of South Florida he was a member of technical staff at Bell Laboratories. Prof. Maurer is a Vietnam era veteran.

Program Committee

Program Chair

Dr. Sam Hijazi, Texas Lutheran University

Program Committee Members

Dr. William A. Booth, Baylor University
Dr. Stefan Andrei, Lamar University
Dr. Rajiv R Malkan, Lonestar College
Dr. Shohreh Hashemi, University of Houston Downtown