

ACM Southeast 2020

Conference Program¹

April 2 – 4, 2020

A Fully Synchronous Online Conference

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Association for
Computing Machinery

Advancing Computing as a Science & Profession

¹ The conference program is open to the public. Skype links are removed. Ver. 3.2

A Note from the Committee:

Welcome to the 2020 ACM Southeast Conference! Originally scheduled at University of South Florida, Tampa, Florida, due to the COVID-19 pandemic, the ACMSE 2020 has been turned to a fully synchronous online conference. We are excited the weekend has finally arrived! Thank you for your submissions and all of the work you invested in perfecting your work. We appreciate your patience throughout the submission, review, and planning process. Many of you provided assistance in the planning process, and for that, we are eternally grateful! All of the papers, posters, tutorials, and workshops being presented are excellent works, and we hope you enjoy the conference!

This year, we have received 135 high quality paper submissions over 9 countries and 105 institutions/departments in 12 technical tracks. Each paper receives a minimum of 3 doubly blind reviews from over 102 volunteers. However, due to space limit, we have to miss lots of high quality papers and only a few can be accepted and presented in the conference. There are 32 accepted as regular papers, 18 accepted as short papers, 8 papers accepted as fast abstracts, and 5 accepted as posters. The acceptance rate is 23.70% for regular papers, 37.04% for the short papers, 42.96% for fast abstracts, and 46.67% for posters. The conference offers 2 keynote speeches, and 2 free workshops/tutorials, and one graduate research symposium.

We are constantly looking for future ACMSE hosting sites. If you wish to host one at your institution, please consider assisting in the planning of next year's conference. Please join us on Thursday at 4:00 PM in room 3708. There is a discussion about next year's conference. Whether you wish to be a reviewer or planner, your participation is welcome and appreciated!

The conference will use Skype for all sessions and all sessions will be recorded available during the conference. If you do not have a Skype account, please create one and download it to your computer before the conference. You may also need a webcam and a microphone. All posted dates and times are based on the Eastern Standard Time (EST). For those who are in a different time zone, please make sure you adjust your schedule accordingly. The Skype links will be available only for registered participants due to bandwidth limit and security.

Thank you again for your involvement in ACMSE 2020! We especially want to thank those of you who reviewed papers. Without your help, the conference would not be possible.

2020 Conference Organization Committee

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Graduate Research Symposium: Dr. Ying Li, Colby College

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Cybersecurity and Privacy: Track Chair: Dr. Svetlana Peltsverger, Kennesaw State University

Mobile Computing and Communication Track Chair: Dr. David Kim, Kennesaw State University

Software Engineering: Track Chair: Dr. Witty Srisa-an, University of Nebraska – Lincoln

Information Technology, Databases, Information Systems Track Chair: Dr. Mingyuan Yan, University of North Georgia

STEM Education Track Chair: Dr. Edward Gehringer, North Carolina State University

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Fintech, Blockchain and Smart Contracts Engineering: Track Chair: Dr. Reza M. Parizi, Kennesaw State University

Data Fusion and Autonomous Vehicles: Track Chairs: Dr. Ravi Sankar, University of South Florida, Dr. Tamer Omar, California State Polytechnic University, Pomona, and co-Chair Alireza Khoshnevis, University of South Florida

2020 Conference Program Committee

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Schedule At---A---Glance (Note: all dates and times are in EST.)

Thursday 4/2

Time	Activity	Skype Link
10:30---11:45	Opening Keynote: Online Materials and Teaching for CS/CE: Research, Experiences, and Recommendations for Going Online due to COVID-19 by Dr. Roman Lysecky	Skype Link
12:00---13:15	Session I: STEM Education	Skype Link
	Session II: Software Engineering	Skype Link
14:00---15:15	Session III: STEM Education and Web Technology	Skype Link
	Session IV: Big Data, Data Mining, HPC, and Machine Learning	Skype Link
15:30---18:15	Workshop/Tutorial (#1): Xuguang Chen, An Introduction to Parallel Programming with MPI and OpenMP	Skype Link
	Workshop/Tutorial (#2): Mario Guimaraes, Machine Learning with MS-SQL Server	Skype Link
18:30---19:30	ACMSE Steering Committee Meeting	Skype Link

Friday 4/3

Time	Activity	Skype Link
10:30---11:45	Keynote: Towards Open World Video Event Understanding and Convolutional Neural Networks Implicitly Learn Object Size by Dr. Larry Hall and Dr. Sudeep Sarkar	Skype Link
11:45 ---11:55	Eric Gamess, ACMSE 2021	Skype Link
12:00---13:15	Session V: Algorithms, Programming Languages, and GUI Attacks	Skype Link
	Session VI: Big Data Analytics and Machine Learning	Skype Link
	Session VII: HCI, Smart City, and Healthcare Informatics	Skype Link
13:30---14:45	Session VIII: Sensor Networks and Financial Technology	Skype Link
	Session IX: Game Design, Development and Innovative Computing	Skype Link
	Session X: Big Data and Machine Learning	Skype Link
15:00---16:15	Session XI: Machine Learning	Skype Link
	Session XII: Machine Learning, Privacy, and High Performance Computing	Skype Link
	Session XIII: Information Technology and System	Skype Link
16:30---17:45	Graduate Research Symposium	Skype Link
	Posters	Skype Link

Saturday 4/4

Time	Activity	Skype Link
10:30---11:45	Session XIV: Data Engineering, Cybersecurity, and Mobile Computing	Skype Link
	Session XV: HCI, Identify Recognition, Malware Analysis, Instruction Technology, and Machine Learning	Skype Link
12:00---13:15	Session XVI: Evolutionary Computing, AI, Robotics, Software Engineering	Skype Link
	Session XVII: Mobile Computing, Text Mining, and Instruction Technology	Skype Link

Thursday Sessions, April 2nd

10:30 – 11:45

Keynote I: Skype Link	
Chair: Morris Chang, University of South Florida	Opening Keynote: Online Materials and Teaching for CS/CE: Research, Experiences, and Recommendations for Going Online due to COVID-19 Roman Lysecky, Professor, Electrical and Computer Engineering, University of Arizona Head of Content, zyBooks - A Wiley Brand

Session I: STEM Education Skype Link		
Chair: Hadi Zanddizari, University of South Florida	12:00	Grayson Fenwick and Cindy Norris, GPGPU Programming for CS Undergraduates: Which one is Superman?
	12:25	Kara Beason, James Fenwick and Cindy Norris, Introducing middle school students to Computational Thinking with the CS First curriculum
	12:50	Sahar Voghoei, Navid Hashemi Tonekaboni, Delaram Yazdaneh, Saber Soleymani, Abolfazl Farahani and Hamid R. Arabnia, Personalized Feedback Emails: A Case Study on Online Introductory Computer Science Courses
Session II: Software Engineering Skype Link		
Chair: Morris Chang, University of South Florida	12:00	João Paulo Oliveira Marum, H. Conrad Cunningham and J. Adam Jones, Unified Library for Dependency Graph Reactivity on Web and Desktop User Interfaces
	12:25	Hassan Pournaghshband and Mfon Okpok, Software Development Success Criteria for Projects

14:00 – 15:15

Session III: STEM Education and Web Technology Skype Link		
Chair: Corey Mize, US Army Engineer Research Laboratory	14:00	Daniel Jeffries, Raghuvier Mohan and Cindy Norris, dsDraw: Programmable Animations and Animated Programs
	14:25	David Cherry, Robert Cummings, Dekita Moon and Kinnis Gosha, Exploring Computing Career Recruitment Strategies and Preferences for Black Computing Undergraduates
	14:50	Corey Mize and Hannah Theisen, Analysis of Public-Facing Government Websites using an Interface Concept Metric and Participant Feedback
Session IV: Big Data, Data Mining, HPC, and Machine Learning Skype Link		
Chair: Robert "Harrison" Hunter, Information Technology Laboratory	14:00	Hazim Shatnawi and H. Conrad Cunningham, Automated Analysis and Construction of Feature Models in Relation Databases Using Web Forms
	14:15	Chaity Banerjee, Tathagata Mukherjee and Eduardo Pasilliao, The Multi-phase ReLU Activation Function
	14:30	Eric Gamess and Brody Smith, Evaluation of TCP over IPv4 and IPv6 for the ESP8266 in Normal Operation and Under a DoS Attack
	14:45	Steven Benzel and Ana Stanescu, Histogram Methods for

		Unsupervised Clustering
	15:00	

15:30 – 18:15

Tutorial 1 Skype Link		
		Xuguang Chen, An Introduction to Parallel Programming with MPI and OpenMP
Tutorial 2 Skype Link		
		Mario Guimaraes, Machine Learning with MS-SQL Server

18:30 – 19:30

ACMSE Steering Committee Meeting Skype Link		
		All committee members and track chairs are invited.

Friday Sessions, April 3rd

10:30 – 11:45

Keynote: Skype Link		
Chair: Dr. Chris Ferekides, Department chair of Electrical Engineering, USF		Towards Open World Video Event Understanding and Convolutional Neural Networks Implicitly Learn Object Size Dr. Sudeep Sarkar (Professor and Chair of Computer Science and Engineering and the Associate Vice President) and Dr. Lawrence O. Hall (Co-Director Institute for Artificial Intelligence + X and Distinguished University Professor Department of Computer Science and Engineering) University of South Florida

11:45 – 11:55

Eric Gamess, ACMSE 2021 Skype Link		
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12:00 – 13:15

Session V: Algorithms, Programming Languages, and GUI Attacks Skype Link		
Chair: Mario Guimaraes, Saint Martin's University	12:00	Jeremy Dohmann and Kyle Deeds, A fast filtering algorithm for massive context free grammars
	12:25	Nadeem Hamid, Lightweight Automated Structure Inference and Binding of Data Sources to Predefined Data Types
	12:50	Ning Yu, Zackary Tuttle, Jake Thurnau and Emmanuel Mireku, AI-Powered GUI Attack and Its Defensive Methods
Session VI: Big Data Analytics and Machine Learning Skype Link		

maChair: Yu-Wen Chen, New York City College of Technology	12:00	Nolan Coble and Ning Yu, A Reservoir Computing Scheme for Multi-Class Classification
	12:25	Morris Wan, Meng Han, Lin Li, Zhigang Li and Selena He, Effects of and Defenses Against Adversarial Attacks on a Traffic Light classification CNN
	12:50	Thejas G.S., Daniel I. Jimenez, S.S. Iyengar, Jerry Miller, N.R. Sunitha and Prajwal Badrinath, COMB: A Hybrid Method For Cross-validated
Session VII: HCI, Smart City, and Healthcare Informatics Skype Link		
Chair: Tamer Omar, Cal Poly Pomona	12:00	Daniel Davis and Feng Zhu, Understanding and Improving Secure Coding Behavior with Eye Tracking Methodologies
	12:25	Tamer Omar, Daniel Bovard and Huy Tran, Smart Cities Traffic Congestion Monitoring & Control System
	12:50	Bertony Bornelus and Hongmei Chi, Integrating Blockchain Technology in Healthcare via Active Learning

13:30 – 14:45

Session VIII: Sensor Networks and Financial Technology Skype Link		
Chair: Jigang Liu, Metropolitan State University	13:30	Tasnia Tabassum, Andrew Allen and Pradipta De, Non-Intrusive Identification of Student Attentiveness and Finding their Correlation with Detectable Facial Emotions
	13:55	Zayed Uddin Chowdhury, Pradipta De and Andrew Allen, Profiling Instructor Activities Using Smartwatch Sensors in a Classroom
	14:20	Yan Wang and Xuelei Ni, Improving Investment Suggestions for Peer-to-Peer (P2P) Lending via Integrating Credit Scoring into Profit Scoring
Session IX: Game Design, Development and Innovative Computing Skype Link		
Chair: Yong Shi, Kennesaw State University	13:30	David Thornton and Falynn Turley, Analysis of Player Behavior and EEG Readings in a Cybersecurity Game
	13:55	Dylan Wang, Melody Moh and Teng-Sheng Moh, Using Deep Learning and Steam User Data for Better Video Game Recommendations
	14:20	Motassem Al-Tarazi and Morris Chang, Prediction-based Joint Energy Optimization for Virtualized Data Centers
Session X: Big Data and Machine Learning Skype Link		
Chair: Yang Song, University of North Carolina Wilmington	13:30	Liyuan Liu, Sanjoosh Akkineni, Paul Story and Clay Davis, Using HR Analytics to Support Managerial Decisions: A Case Study
	13:55	Zhuolin Li, Hao Zhang, Hossain Shahriar and Hisham Haddad, Cyber Fraud Prediction with Supervised Machine Learning Techniques
	14:20	Jhanvi Vyas, Meng Han, Lin Li, Seyedamin Pouriyeh and Selena He, Integrating Blockchain Technology into Healthcare

15:00– 16:15

Session XI: Machine Learning Skype Link		
Chair: Dan Lo, Kennesaw State University	15:00	Yan Wang and Xuelei Ni, Risk Prediction of Peer-to-Peer Lending Market by a LSTM Model with Macroeconomic Factor
	15:25	Brandon Phillips, Eric Gamess and Sri Krishnaprasad, An Evaluation of Machine Learning-based Anomaly Detection in a SCADA System Using the Modbus Protocol
Session XII: Machine Learning and Image Processing Skype Link		
Chair: Zakhia Abichar, University of Central Florida	15:00	Selena He, Meng Han, Jack Zheng and Herman Ray, Implementing Capsule Neural Networks in Traffic Light Image Recognition
	15:25	Patrick O'Boyle, Jeffrey Galloway and Austin White, Parking Solution for WKU: Car Counting with OpenCV
Session XIII: Information Technology and Systems Skype Link		
Chair: Witawas Srisa-An, University of Nebraska, Lincoln	15:00	Cary Xiao, MADSA: Music Accuracy Development through Spectral Analysis
	15:25	Wei Jin, Cynthia Johnson and Sonal Dekhane, A Guided Inquiry Approach for Detecting & Developing Problem-Solving Strategies for Novice Programming Students
	15:50	Lucas Layman, Yang Song and Curry Guinn, Toward Predicting Success and Failure in CS2: A Mixed-Method Analysis

16:30– 17:45

Graduate Research Symposium Skype Link		
Chair: Ying Li, Colby College	16:30	Songqiao Yu, Disinformation Detection using Passive Aggressive algorithms
Posters Skype Link		
Chair: Eric Gamess, Jasonville State University	16:30	Jonathan Jenkins, An Access Abstraction Model for Mitigating the Insider Threat
	16:45	Ava Podrazhansky, Rebekah Roepke, Jennifer Nguyen, and Dan Lo, Utilizing Computer Vision, Clustering and Neural Networks for Melanoma Categorization
	17:00	Karl Kevin Tiba Fossoh, Graphical Representation of Text Semantics
	17:15	Lori Kim, Meng Han and Rongkai Guo, Machine Learning in the Analysis of Mental Disease

Saturday Sessions, April 4th

10:30 – 11:45

Session XIV: Data Engineering, Cybersecurity, and Mobile Computing		
Skype Link		
Chair: Jay Ligatti, University of South Florida	10:30	Deepak Bhaskar Acharya and Huaming Zhang, Feature Selection and Extraction for Graph Neural Networks
	10:45	Robert Hunter, Barry White, Reena Patel and Jerrell Ballard, Partitioning Terabyte-scale Faceted Geometry Models for Efficient Parallel Ray Tracing Using Out-of-core Memory
	11:00	Nisheeth Agrawal, Frank Zhu and Sandra Carpenter, Do You See the Subliminal Warning?
	11:15	William Roden and Lucas Layman, Cry Wolf: Toward an Experimentation Platform and Dataset for Human Factors in Cyber Security Analysis
	11:30	Brandon Corn, Ashley Ruiz, Alfredo Perez, Cagri Cetin and Jay Ligatti, An Evaluation of the Power Consumption of Coauthentication as a Continuous User Authentication Method in Mobile Systems
Session XV: HCI, Identify Recognition, Malware Analysis, Instruction Technology, and Machine Learning		
Skype Link		
Chair: Hyesung Park, Georgia Gwinnett College	10:30	Daniel Leblanc, Jay Patel, Aditya Suri, Felix Hamza-Lup and Ionut Iacob, Attention Patterns Detection using Brain Computer Interfaces
	10:45	Sahil Arora, Mingyuan Yan and Selena He, Long Range Iris Recognition a reality or a Myth?
	11:00	Nusrat Asrafi, Dan Lo, Reza Meimandi Parizi, Yong Shi, and Yu-Wen Chen, Comparing Performance of Malware Classification on Automated Stacking
	11:15	Hyesung Park, Wei Jin, Richard Price, Tacksoo Im, Sonal Dekhane, Robert Lutz and Na'El Abu-Halaweh, The Impact of Affordable Learning Open Textbook on Computing Education
	11:30	Hao Zhang, Zhuolin Li, Hossain Shahriar, Xiaohua Xu and Dan Lo, Learning Environment Containerization of Machine Learning for Cybersecurity

12:00 – 13:15

Session XVI: Evolutionary Computing, AI, Robotics, Software Engineering		
Skype Link		
Chair: Hadi Zanddizari, University of South Florida	12:00	Jamil Saquer, An Evolutionary Computing Solution to the Jump It Problem
	12:15	Margie Ruffin, Jaye Nias, Kayla Taylor, Gabrielle Singleton and Amber Sylvain, Character Development to Facilitate Retention in a Storytelling Robot
	12:30	Jaye Nias and Margie Ruffin, CultureBot: A Culturally Relevant Humanoid Robotic Dialogue Agent
	12:45	Viet Hung Pham, Tam Nguyen, Phong Vu and Tung Nguyen, A Vision on Mining Visual Logs of Software
	13:00	Tam Nguyen, Phong Vu and Tung Nguyen, API Misuse Correction: A Fuzzy Logic Approach
Session XVII: Mobile Computing, Text Mining, and Instruction Technology		
Skype Link		
Chair: Yanjun Zhao, Troy University	12:00	Ava Podrazhansky, Hao Zhang, Meng Han and Selena He, A Chatbot-based Mobile Application to Predict and Early-prevent Human Mental Illness
	12:15	Yang Song, Yunkai Xiao, Jonathan Stephens, Emma Ruesch and Sean Roginski, Suitability of SCS1 as a Pre-CS2 Assessment Instrument: A Comparison with Short Deliberate-Practice Questions
	12:30	Phong Vu, Tam Nguyen and Tung Nguyen, Fuzzy Multi-intent Classifier for User Generated Software Documents
	12:45	Walter Alan Cantrell, Katia Maxwell, Mikel Petty, and Tymaine Whitaker, Matrix Reduction Verification of Extended Petri Nets

Keynote Speakers

Title: Online Materials and Teaching for CS/CE: Research, Experiences, and Recommendations for Going Online due to COVID-19

Speaker: Roman Lysecky, Professor, Electrical and Computer Engineering, University of Arizona; Head of Content, zyBooks - A Wiley Brand

Session Chair: Dr. Morris Chang, Department chair of Electrical Engineering, USF

Time: 10:30 – 11:45, April 2, 2020

Link: Skype Link

Abstract:

Online active-learning content and program auto-grading with immediate feedback have enabled new approaches to teaching lower-division computer science/engineering courses. Having started with the goal of reducing failure rates in lower-division CS/CE courses by replacing existing textbooks/homework with web-native, integrated, active-learning content, zyBooks now cover more than 18 CS/CE courses and have been used by more than 700 universities and 1 million students. This talk briefly introduces the web-native, active-learning learning content that consists of aggressively-minimized text, animations, interactive learning questions, auto-graded homeworks, and auto-graded programming labs. We summarize published research findings that highlight results on student learning outcomes, student earnestness in completing reading activities, student struggle rates and stress, and student engagement in class.

Many faculty are being asked to quickly switch their courses online due to the COVID-19 situation. Instructors are scrambling to produce videos and online assignments, and figuring out how to give students feedback, to serve students remotely. Because the zyBook already provides extensive interactive learning, with automated instant feedback for the students outside of class, there's little/no need to create additional content or feedback mechanisms. We further highlight best practices for teaching courses online and provide recommendations for quickly switching a class to online using zyBooks.

Bio:

Roman Lysecky is a Professor of Electrical and Computer Engineering at the University of Arizona and Head of Content at zyBooks - A Wiley Brand. He received his Ph.D. in Computer Science from the University of California, Riverside in 2005. His research focuses on embedded systems with emphasis on medical device security and on computer science/engineering education. He is an inventor on one US patent. He has authored more than 10 textbooks and contributed to several more on topics including C, C++, Java, Data Structures, Digital Design, VHDL, Verilog, Web Programming, and Computer Systems. His recent books with zyBooks utilize a web-native, active-learning approach that has shown measurable increases in student learning and course grades. He has also authored more than 100 research publications in top journals and conferences. His research has been supported by the National Science Foundation (including a CAREER award in 2009), the Army Research Office, the Air Force Office of Scientific Research, and companies such as Toyota. He received the Outstanding Ph.D. Dissertation Award from the European Design and Automation Association (EDAA) in 2006, nine Best Paper Awards, and multiple awards for Excellence at the Student Interface from the College of Engineering at the University of Arizona.



Title: Towards Open World Video Event Understanding and Convolutional Neural Networks Implicitly Learn Object Size

Speaker: Dr. Sudeep Sarkar and Dr. Lawrence O. Hall, University of South Florida

Session Chair: Dr. Chris Ferekides, Department chair of Electrical Engineering, USF

Time: 10:30 – 11:45, April 3, 2020

Link: Skype Link

Abstract:

This talk will provide a very brief overview of the USF Institute for Artificial Intelligence + X and then discuss the two projects of the title.

Events are central to the content of human experience. From the constant stream of sensory onslaught, the brain segments, extracts, represents aspects related to events, and stores them in memory for future comparison, retrieval, and re-storage. Contents of events consist of objects/people (who), location (where), time (when), actions (what), activities (how), and intent (why). Many deep learning-based approaches extract this information from videos. However, most methods cannot adapt much beyond what they were trained on and are incapable of recognizing new events beyond those they were explicitly programmed or trained for. The main limitation of current event analysis approaches is the implicit closed world assumption. The ability to support open world inference is limited by three main aspects: the underlying representation, the source of semantics, and the ability to continuously learn or adapt. This part of the talk will focus on flexible representations, amenable for open-world and self-supervised learning, that are not dependent on the existence of a large amount of training data.

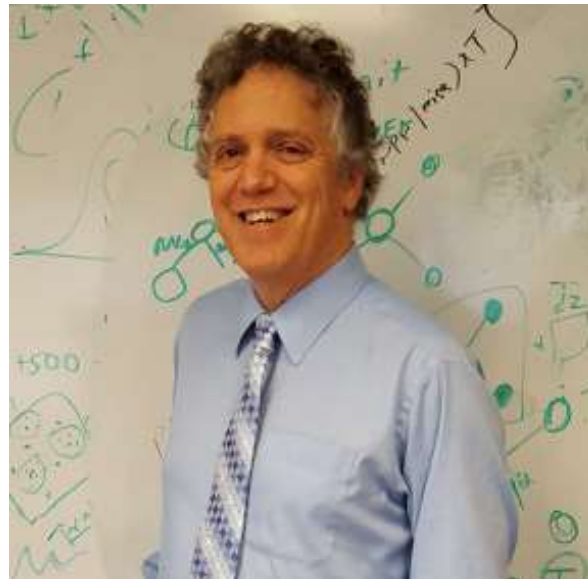
There are very good models using convolutional neural networks (CNN) to predict lung nodules in computed tomography (CT) images which will become malignant in the future (>90% accurate). Size is an important indicator of potential malignancy (72% accurate by itself). However, the variable size nodules in lung screening CT images have to be resized to a standard size for CNN training/testing. So, we looked at whether the networks had learned a concept of nodule size. It is shown that they can generally learn object size from experiments using both lung CT images and natural images of animals from the COCO dataset.

Bio:

Sudeep Sarkar is a Professor and Chair of Computer Science and Engineering and the Associate Vice President for Special Projects at the University of South Florida in Tampa. He is a Fellow of the American Association for the Advancement of Science (AAAS), Institute of Electrical and Electronics Engineers (IEEE) and International Association for Pattern Recognition (IAPR), American Institute for Medical and Biological Engineering (AIMBE), and a Fellow and member of the Board of Directors of the National Academy of Inventors (NAI). He has served on many journal boards and is currently the Editor-in-Chief for Pattern Recognition Letters. He has 25-year expertise in computer vision and pattern recognition algorithms and systems, holds ten U.S. patents, licensed technologies, and has published high-impact journal and conference papers.



Lawrence O. Hall is a Distinguished University Professor in the Department of Computer Science and Engineering at University of South Florida and the co-Director of the Institute for Artificial Intelligence + X. He received his Ph.D. in Computer Science from the Florida State University in 1986 and a B.S. in Applied Mathematics from the Florida Institute of Technology in 1980. He is a fellow of the IEEE, AAAS, AIMBE and IAPR. He received the Norbert Wiener award in 2012 and the Joseph Wohl award in 2017 from the IEEE SMC Society. He is a past President of the IEEE Systems, Man and Cybernetics Society, former EIC of what is now the IEEE Transactions on Cybernetics. His research interests lie in learning from big data, distributed machine learning, medical image understanding, bioinformatics, pattern recognition, modeling imprecision in decision making, and integrating AI into image processing. He continues to explore un and semi-supervised learning using scalable fuzzy approaches.



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