

CONFERENCE PROGRAM

**The 3rd International Conference on Information
and Computer Technologies
(ICICT 2020)**

**The 4th International Conference on Compute and Data Analysis
(ICCDA 2020)**

Silicon Valley, San Jose, USA

March 9-12, 2020

Co-organized by



**ILLINOIS STATE
UNIVERSITY**

UND ENGINEERING
THE UNIVERSITY OF NORTH DAKOTA

Technical Sponsored by



UNIVERSITY of HAWAII*
MAUI COLLEGE

**SUNY COLLEGE
AT ONEONTA**

UF UNIVERSITY of
FLORIDA

FAU
COLLEGE OF ENGINEERING
& COMPUTER SCIENCE

AGENDA

MONDAY 3.9

9:00-12:00

Preregistration

14:00-17:00

Note:

*Conf. venue: Biltmore Hotel and Suites

*Add: 2151 Laurelwood Road, Santa Clara, CA 95054

*Today is for collecting conference materials and onsite registration.

*Certificate will not be available at the registration desk until you finish the presentation at the conference day (except the listeners and posters).

*Accommodation is not provided, and it's suggested to make an early reservation, since it's high season during the conference period.

Preregistration

Hotel lobby on entrance floor

Opening & Keynote Speeches Room

Saratoga Ballroom @ 1st Floor

Oral Presentation Sessions Rooms

Session I & Session V @ Salon I

Session II & Session VI @ Salon II

Session III & Session VII @ Salon III

Session IV & Session VIII @ Tiburon

TUESDAY 3.10

9:00-11:45

Presider of Opening & Keynote Speech

- Prof. Emanuel Grant, University of North Dakota, USA

9:00-9:05

Welcome Address

- Prof. Anu Gokhale, Illinois State University, USA

9:05-9:45

Keynote Speaker I

- Prof. Mohsen Guizani, Qatar University, Qatar
"Healthcare Systems Security Schemes in the IoT Era"

9:45-10:25

Keynote Speaker II

- Prof. Anu Gokhale, Illinois State University, USA
"Algorithms: Investigating Bias and Why It Matters"

10:25-11:05

Group Photo & Coffee Break

11:05-11:45

Keynote Speaker III

- Prof. Alexander Zipf, Heidelberg University, Germany

12:00-13:10

Lunch @ lobby atrium

13:10-15:25

Oral Presentation Sessions

- Session I—"High-performance Computing"
- Session II—"Information Education and Information Government"
- Session III—"Blockchain and Data Security"
- Session IV—"System Model and Calculation Method"

15:25-15:55

Coffee Break

15:55-18:10

Oral Presentation Sessions

- Session V—"Intelligent Information System and Application"
- Session VI—"Data Structure and Data Analysis"
- Session VII—"Network Security and Key Technologies"
- Session VIII—"Software Design and Development"

18:10-20:00

Dinner & Awards @ Napa Valley Room (1st Floor)

WEDNESDAY 3.11

9:00-11:15 Oral Presentation Sessions

- Session IX—“Image Processing Technology and Method”
- Session X—“Computer Theory and Application”
- Session XI—“Communication and Information System”
- Session XII—“Internet of Things Engineering and Application”

11:15-11:50 *Theme Break & Poster Session*

Oral Presentation Sessions Rooms

Session IX @ Salon I
Session X @ Salon II
Session XI @ Salon III
Session XII @ Tiburon

THURSDAY 3.12

Optional Recommendations in Silicon Valley

- Intel Museum
- The Computer History Museum (CHM)
- Hiller Aviation Museum
- Tech Museum of Innovation
- Stanford University
- Hoover Tower
- Municipal Rose Garden
- San Jose Museum of Art
- San Jose Museum of Quilts & Textiles
- The San Jose Flea Market

INSIDE THIS PROGRAM

3	Welcome Address
4	Local Information
6	Conference Committees
8	Speakers
11	Guidelines for Presentations
12	March 10 afternoon detailed program
20	March 11 morning detailed program
24	Posters
27	March 12 tour recommendation
29	Author Index

WELCOME ADDRESS

It is indeed a pleasure to welcome all participants of The 3rd International Conference on Information and Computer Technologies (ICICT 2020) and The 4th International Conference on Compute and Data Analysis (ICDA 2020) being held in Silicon Valley, San Jose, USA, March 9-12, 2020. The conference is co-organized by the Illinois State University, United States and University of North Dakota, United States. The conference is focuses on issues related to information, computer technologies and data analysis. The conference also brings researchers, academics, practicing engineers, as well as advanced research students together from a number of countries and various sectors to share and discuss their research results and experiences.

The conference program covers keynote presentations, parallel presentations including a wide variety of topics in the field of not only Information and computer technologies but also data analysis. We hope that every participant will find enough material of interests to individual needs. We also hope this conference can provide all participants with a forum to exchange scientific ideas, and to inspire new researches, and new contacts for closer co-operation, so that we can, together, envisage the future of a promising development of related science and technology.

We would like to thank all who helped in making this conference a success. They include the conference committees and student volunteers: reviewers who put in a lot of invaluable time in reviewing papers, members of the organization committee for all the arrangements, and the authors and participants, who make this conference a reality. Finally, we hope you can find this conference is indeed a rewarding event.

San Jose is the economic, cultural and political center of Silicon Valley, and the largest city in Northern California. San Jose is a global city, notable as a center of innovation, for its affluence, Mediterranean climate, and extremely high cost of living. San Jose's location within the booming high tech industry, as a cultural, political, and economic center has earned the city the nickname "Capital of Silicon Valley".

We wish you a successful conference and enjoyable visit to San Jose.

Conference Organizing Committees
Silicon Valley, San Jose, USA

LOCAL INFORMATION

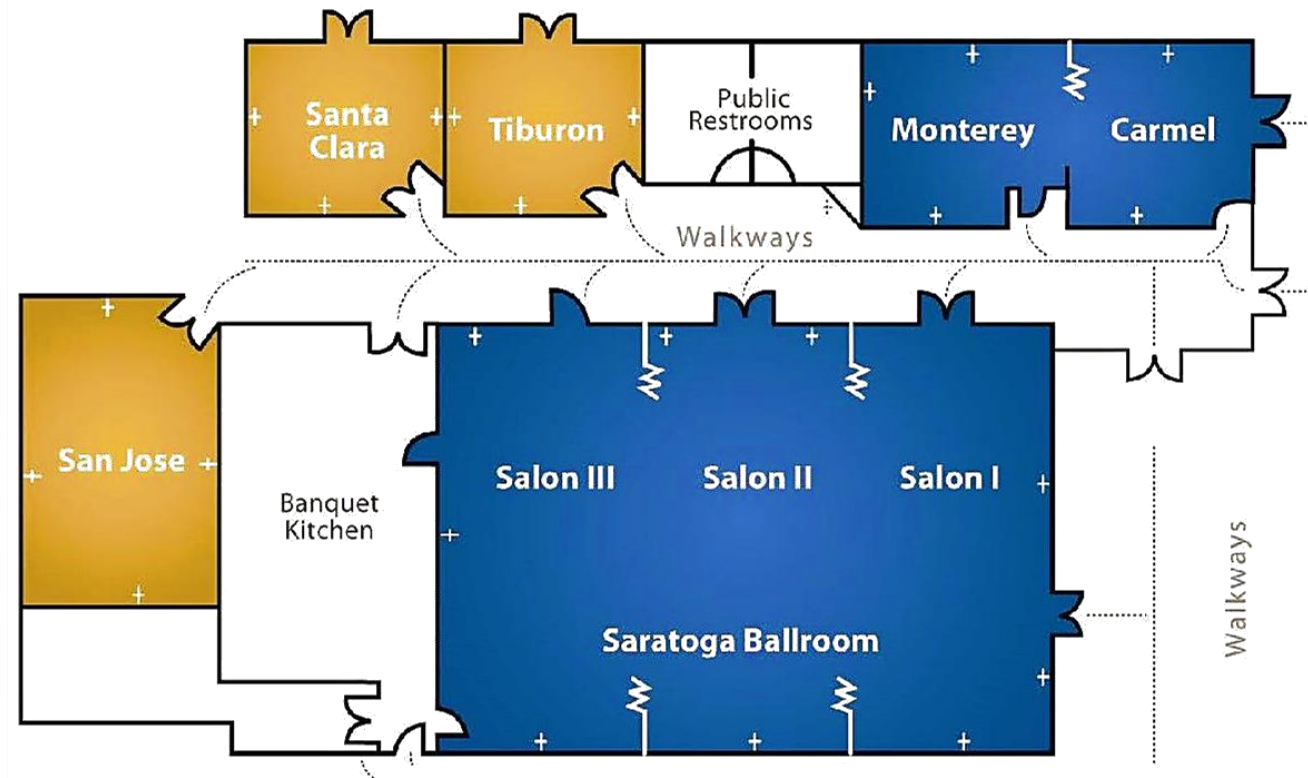


Biltmore Hotel and Suites (Silicon Valley, San Jose)

Add: 2151 Laurelwood Road, Santa Clara, CA 95054

Website: <https://www.hotelbiltmore.com>

Conference Room Floor Map (1st Floor)



Make Your Travel Easily

Public Transportation

There are four independent rail systems (described below). They are independently operated, so you may have to purchase **separate tickets** when you switch between the different systems.

- Caltrain
- BART
- VTA Light Rail System
- Muni Metro

Ride Sharing

Ride sharing allows you to very quickly request a ride from your mobile device and is a convenient alternative to a traditional taxi. Silicon Valley is home to the biggest ride sharing platforms Uber and Lyft.

Car Sharing

Zipcar provides automobile reservations to its members, billable by the hour or day.

Bike Sharing

Bay Area Bike Share is a public bicycle sharing system in Silicon Valley.

Practical Information

- **Currency:** US Dollar (USD)
- **Emergency call:** 911
- **Spoken languages:** English. Silicon Valley is a diverse area, with many nationalities and languages represented. Other languages common in the area include: Spanish, Vietnamese, Farsi, Hindi, and Chinese (Mandarin).
- **Best time to visit:** all year round! (warm mediterranean climate, with temperatures rarely dropping below 13 C, or 55 degrees Fahrenheit).
- **Arriving via airport:** SJC (San Jose), only 3 miles to conference venue. The Airport Flyer runs from 5 AM – 11:30 PM between the Metro Light Rail Station and Santa Clara Caltrain Station.

Getting Around

- The Valley Transit Authority is responsible for the public transit in Silicon Valley, and runs a system of buses and lightrail. Fares are \$2 for a single ride; \$6 for a day pass, and \$70 for a monthly pass.
- The Caltrain runs between most cities in The Valley, and fares depend on zones traveled in.
- Car rental: Look for big chains (e.g. National, Budget, Thrifty) at the airport. Alternatively, you can try ZipCar – pickup stations are everywhere in Silicon Valley.

Tips

- Late night food options are often restricted to fast food.
- At night, do not walk alone in Willow Glen, downtown, or EastSan Jose.

★ Security Reminder ★

- Wear your conference badges in an easily visible location at all times while within the conference area – this helps everyone identify you as a member of the event community.
- Never discard the participation badges at will. Be aware that no access for people without participation badges.
- For your property safety, please take good care of your valuables at any time during the conference venue and hotel area.
- Always be alert.

Disclaimer: The conference organizer does not assume any responsibility for the loss of personal belongings of the participants.

Prevention: frequent washing of hands with soap and water; not touching the eyes, nose, or mouth with unwashed hands; practicing good respiratory hygiene; cover coughs and sneezes with a tissue; avoid sharing personal household items.

CONFERENCE COMMITTEES

Advisory Chair

Shigang Chen, University of Florida, United States

General Chairs

May Huang, International Technological University, United States

Anu Gokhale, Illinois State University, United States

Sen Zhang, State University of New York College at Oneonta, United States

Program Chairs

Sule Yildirim Yayilgan, Norwegian University of Science and Technology, Norway

Shawn X. Wang, California State University, United States

Emanuel Grant, University of North Dakota, United States

Workshop Chair

Letian Huang, University of Electronic Science and Technology of China, China

Technical Program Committee

Chunshan Yang, Guilin University of Aerospace Technology, China

Ming-Yueh Hwang, National Taiwan Normal University, China

Feng-Jian Wang, National Chiao Tung University, China

Serdar Biroğul, Duzce University, Turkey

Bharath Reddy, Process Automation R&D Schneider-Electric, United States

Ali Reza Alaei, Southern Cross University, Australia

Doyel Pal, LaGuardia Community College, United States

Olga Lopez, Instituto Tecnológico y de Estudios Superiores de Monterrey, Mexico

Robinson Jiménez-Moreno, Nueva Granada Military University, Colombia

Valeriy Gavrishchaka, Applied Quantitative Solutions for Complex Systems, United States

Loren Schwiebert, Wayne State University, United States

Ali Al-Aufi, Sultan Qaboos University, Oman

Reza Hashemian, Northern Illinois University, United States

Nong Ye, Arizona State University, United States

Jian-Ao Lian, Prairie View A&M University, United States

Yves Rybarczyk, Universidade NOVA de Lisboa, Portugal

Driss Kettani, Al-Akawayn University, Morocco

Mehmet Karaata, Kuwait University, Kuwait

Nai-Wei Lo, National Taiwan University of Science and Technology, China

Ming-Hour Yang, Chung Yuan Christian University, China

Muthoni Masinde, Central University of Technology, South Africa

Mikhail Petrovskiy, Lomonosov Moscow State University, Russia

Silvia Bravo, Technical University of Cotopaxi, Ecuador

Noraidah Sahari, Universiti Kebangsaan Malaysia, Malaysia
Fedra Trujillano, Pontifical Catholic University of Peru, Peru
Jessenia Gonzalez, Pontifical Catholic University of Peru, Peru
Hongsheng He, Wichita State University, United States
Javed Ahmed, Norwegian University of Science and Technology, Norway
Ferhat Ozgur Catak, Norwegian University of Science and Technology, Norway
Athar Khodabakhsh, Norwegian University of Science and Technology, Norway
Ogerta Elezaj, Norwegian University of Science and Technology, Norway
Tian Song, Tokushima University, Japan
Erica Teixeira Gomes de Sousa, Federal Rural University of Pernambuco R. Manuel de Medeiros, Brazil
Eyüp Burak CEYHAN, Bartın University, Turkey
Sandeep Reddivari, University of North Florida, United States
Dean Bushey, Florida Polytechnic University, United States
Feng-Jen Yang, Florida Polytechnic University, United States
Xin Fang, Northeastern University, United States
Charoenchai Wongwatkit, Mae Fah Luang University, Thailand
Phoey Lee Teh, Sunway University, Malaysia

KEYNOTE SPEAKER I



Prof. Mohsen Guizani, Qatar University, Doha, Qatar

IEEE Fellow, Editor-in-Chief, IEEE Network

“Healthcare Systems Security Schemes in the IoT Era”

Abstract: Internet of Things (IoT) is transforming our society and daily lives by connecting the world. This is expected to fundamentally transform industry, business, transportation and healthcare. However, this ubiquitous connection brings with it many challenges that range from security, scalability, data analytics, to device-level protocols. It is estimated that there will be hundreds of billions of IoT devices that need to be connected in the next few years. In addition, more than half of the world’s population live in cities, many with multiple devices that need to be connected to the Internet. This is expected to create a complex infrastructure. These smart services rely on computation and communication resources. Furthermore, being able to provide adequate services using these complex systems present enormous challenges.

In this Keynote, we review the current efforts by experts around the world to mitigate some of these challenges. Then, we showcase our research activities to contribute to these efforts and advocate possible solutions using AI and other tools. We provide ways on how to manage the available resources intelligently and efficiently in order to offer better living conditions and provide better services. Finally, we discuss some of our research results to support a variety of applications including how to secure these devices for successful healthcare service delivery in different aspects.

BIO: Mohsen Guizani (S’85–M’89–SM’99–F’09) received the B.S. (with distinction) and M.S. degrees in electrical engineering, the M.S. and Ph.D. degrees in computer engineering from Syracuse University, Syracuse, NY, USA, in 1984, 1986, 1987, and 1990, respectively. He is currently a Professor at the Computer Science and Engineering Department in Qatar University, Qatar. Previously, he served in different academic and administrative positions at the University of Idaho, Western Michigan University, University of West Florida, University of Missouri-Kansas City, University of Colorado-Boulder, and Syracuse University. His research interests include wireless communications and mobile computing, computer networks, mobile cloud computing, security, and smart grid. He is currently the Editor-in-Chief of the IEEE Network Magazine, serves on the editorial boards of several international technical journals and the Founder and Editor-in-Chief of Wireless Communications and Mobile Computing journal (Wiley). He is the author of nine books and more than 500 publications in refereed journals and conferences. He guest edited a number of special issues in IEEE journals and magazines. He also served as a member, Chair, and General Chair of a number of international conferences. Throughout his career, he received three teaching awards and four research awards. He also received the 2017 IEEE Communications Society WTC Recognition Award as well as the 2018 AdHoc Technical Committee Recognition Award for his contribution to outstanding research in wireless communications and Ad-Hoc Sensor networks. He was the Chair of the IEEE Communications Society Wireless Technical Committee and the Chair of the TAOS Technical Committee. He served as the IEEE Computer Society Distinguished Speaker and is currently the IEEE ComSoc Distinguished Lecturer. He is a Fellow of IEEE and a Senior Member of ACM.

KEYNOTE SPEAKER II



Prof. Anu Gokhale, Illinois State University, USA

“Algorithms: Investigating Bias and Why It Matters”

Abstract: Artificial intelligence or AI continues to transform our world in unimaginable ways, from government and financial institutions to healthcare, aiding decision-making by providing predictions based on historic data. The intelligence behind AI comes from algorithms applied to large datasets. Simply put, algorithms are stepwise instructions for accomplishing a task; these are computational tools that model the decision-making processes to provide comprehensive solutions to complex problems. Algorithm design involves assumptions and codification of mindsets; the creation of an algorithm is often considered proprietary information and very closely guarded by its owners. Additionally, today’s algorithm designs are often armed with machine learning methods based on neural networks which are so complex that even their creators do not exactly know how they work. Not being able to access the inner workings of an algorithm is a challenge for both developers and users. The talk will address the issues and processes that could result in flaws in algorithm design, how repeat applications propagate errors, and conclude with a discussion of methods to counter such effects.

BIO: Dr. Anu A. Gokhale is a Distinguished Professor and Coordinator of the Computer Systems Technology program at Illinois State University (ISU). She has completed thirty years as faculty and has received several College and University research, teaching and service awards. Gokhale was named Fulbright Distinguished Chair in STEM+C at the University of Pernambuco, Brazil, 2016-17; was a Faculty Fellow in Israel and Fulbright Specialist in Cybersecurity at Gujarat Technological University, India in summer 2017; and a Visiting Professor in College of Business at Shandong University in Jinan, China during spring 2017 where she focused on data analytics and e-commerce. Her achievements encompass extensively cited refereed publications; groundbreaking externally funded research supported by a continuous stream for 20 years of grants from state and federal agencies including the National Science Foundation; and elevation of the ISU student experience through excellence in teaching, mentorship, and the creation of opportunities for students to get involved in research. The current NSF funded project is in Computing Education for the 21st Century. Originally from India, she has a master’s in physics–electronics from the College of William & Mary, and a doctorate from Iowa State University. Dr. Gokhale authored a second edition of her book Introduction to Telecommunications, which has an international edition in Chinese. She continues to be an invited keynote speaker at various conferences, latest ones include: 2019 International Conference on Compute and Data Analysis, Maui, USA; 2018 International Conference on Frontiers of Educational Technologies, Moscow, Russia; 2017 International Conference on Knowledge Engineering and Applications, London, UK; 2016 International Conference on Communication and Information Systems, Bangkok, Thailand; and 2015 International Conference on Information Technology, Amman, Jordan. As an active volunteer in IEEE, she has served as R4 Educational Activities Chair, Women in Engineering Coordinator, Chair of International Electro/Information Technology 2010 Conference, and MGA representative to the Educational Activities Board. She was honored with the IEEE Third Millennium Medal and 2019 Region 4 Outstanding Professional Award. She consults for business and industry to increase productivity using data analytics and leveraging e-technologies. She has delivered multiple workshops focusing on inclusion & diversity as well as “STEM for All” public policy.

KEYNOTE SPEAKER III



Prof. Alexander Zipf, Heidelberg University, GIScience Research Group, Germany

BIO: Prof. Dr. Alexander Zipf is chair of GIScience (Geoinformatics) at Heidelberg University since 2010. He is member of the Centre for Scientific Computing (IWR) and founding member of the Heidelberg Center for the Environment (HCE).

From 2012-2014 he was Managing Director of the Department of Geography, Heidelberg University. In 2011-2012 he acted as Vice Dean of the Faculty for Chemistry and Geosciences, Heidelberg University. Currently he is busy establishing the Heidelberg Institute for Geoinformation Technology (HeiGIT.org) with its three main pillars: Smart Mobility, Volunteered Geographic Information for Humanitarian Aid and Big Spatial Data Analytics.

2012 -2018 he was speaker of the graduate school "CrowdAnalyser - Spatio-temporal Analysis of User-generated Content". He is also member of the editorial board of several journals and organized a set of conferences and workshops. 2012-2015 he was regional editor of the ISI Journal Transactions in GIS (Wiley). Currently he is associated editor of the international journal Geo-spatial Information Science (GSIS) by Taylor & Francis (open access).

Before coming to Heidelberg he led the Chair of Cartography at Bonn University and earlier was Professor for Applied Computer Science and Geoinformatics at the University of Applied Sciences in Mainz, Germany. He has a background in Mathematics and Geography from Heidelberg University and finished his PHD at the European Media Laboratory EML in Heidelberg where he was the first PhD student. There he also conducted further research as a PostDoc for 3 years.



GUIDELINES FOR PRESENTATIONS

- **Instructions for Presenters**

The duration of a keynote presentation is 40 minutes. The duration of a regular presentation is 15 minutes. This includes 12 minutes for the presentation and 3 minutes for Q&A. We would appreciate if all presenters can adhere strictly to this time limit.

Presentation must be carried out using Microsoft PowerPoint or PDF, and upload the files before the session starts. No slide projectors will be made available.

Speakers are requested to be in their respective session rooms at least 10 minutes prior to the commencement of each session.

One Best Presentation will be chosen for each session, so it's encouraged to stay the whole session.

- **Instructions for Presiders**

Please time the presentation. Remind the speaker as follows:

It is a good idea to remind your speakers at the start of the session that you will timing the speech. Please remember the time frame. Keeping the program to time is very important. Please be aware of the time periods speakers have been designed to present.

If someone in your session didn't show up, please go on with next speaker, and recall the missing one every time when it's next speaker's turn. In this case, we require the speakers of each session should stay the whole session.

Please organize a session group photo at the end of your session.

- **Instructions for Poster Presentation**

Poster presenter can leave your poster at the registration desk and our staff will help you to put up the posters at least 1 hour prior to the commencement of each poster session.

At least one author should be present for each poster during the poster session.