

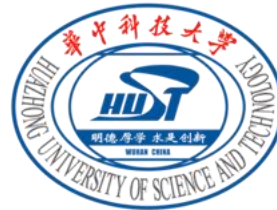
# 2020 Hawaii Conferences Agenda

March 12-14, 2020  
Hawaii, USA

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## **WELCOME REMARKS**

We welcome you to the Second International Conference on Blockchain Technology (ICBCT 2020) and the Second International Conference on Applied Business and Economics (ICABE 2020). Over the next three days you will meet researchers and practitioners working in a wide variety of disciplines, organized around common interests in blockchain technology and applied business and economics. The conferences received submissions from more than ten different countries and regions, which were reviewed by international experts. Around 55% of submitted papers have been selected for presentation and publication.

We hope that your work and that of your institution or company will be enhanced both by what you learn and by those with whom you connect over the next three days. Our field is enriched by the dialogue among colleagues from around the world which occurs during presentation sessions as well as informal conversations. We hope this is a memorable and valuable experience for you, and that you will enjoy discovering the research, practical knowledge, and personal contacts available to you. Our thanks go out to the authors, the reviewers, and the Program Committee member. Their expertise, enthusiasm, and time commitment enabled us to prepare the final program. We hope that all participants and other interested readers benefit from and enjoy the presentations and proceedings and also find it stimulating in this process. Once again, thanks for coming to ICBCT2020 and ICABE2020. We are planning more and better international conference experiences. Your suggestions and comments are welcome.

We wish you success in your presentations and networking, and we hope you enjoy beautiful Hilo, Hawaii.

**Conference Chair**  
**Prof. Emmeline dePillis**  
**University of Hawaii at Hilo, USA**

## **CONFERENCE VENUE**

### **‘Imiloa Astronomy Center of Hawaii University of Hawaii-Hilo**

600 ‘Imiloa Place Hilo, Hawaii 96720, United States

Tel: 808-932-8926

[kwakita@hawaii.edu](mailto:kwakita@hawaii.edu)

[www.imiloahawaii.org](http://www.imiloahawaii.org)



‘Imiloa Astronomy Center of Hawaii, a part of the University of Hawaii at Hilo, opened its doors on February 20, 2006. The \$28 million, 40,000-square-foot exhibition and planetarium complex is located on nine acres in the University of Hawaii's Science and Technology Park, above the UH-Hilo campus. Originally called the Maunakea Astronomy Education Center, Imiloa was developed in the mid-1990s by a team of educators, scientists and community leaders who understood the need for a comprehensive educational facility that would showcase the connections between the rich traditions of Hawaiian culture and the groundbreaking astronomical research conducted at the summit of Maunakea.

‘Imiloa brings together members of the Hawaiian and astronomy communities to share a common vision for the future, bringing information about the cultural and natural history of Maunakea to students, teachers, our local residents, and visitors from around the world. ‘Imiloa links to early Polynesian navigation history and knowledge of the night skies, and today's renaissance of Hawaiian culture and wayfinding with parallel growth of astronomy and scientific developments on Hawaii Island.

### **How to get there?**

#### **From Hilo International Airport to ‘Imiloa Astronomy Center**

Distance: 3.5km

Time: 10 minutes by car



## **INSTRUCTIONS FOR PRESENTER**

### **◆ On-Site Registration**

- 1) Your paper ID is required for the registration.
- 2) Conference Materials Collection.
- 3) Certificate of Listener can be collected at the registration counter.
- 4) Certificate of Presentation can be awarded by the session chair at the end of each session.
- 5) You can register on March 12 whole day and March 13 morning at the registration counter.
- 6) The organizer won't provide accommodation, and we suggest you make an early reservation.

### **◆ Oral Presentations**

- 1) Devices Provided by the Conference Organizer: Laptops (with MS-Office & Adobe Reader) Projectors & Screens
- 2) Laser Sticks
- 3) Materials Prepared by the Presenters
- 4) Power Point (Files should be copied to the conference laptop at the beginning of each session)
- 5) Duration of each Presentation
- 6) Keynote Speech: 40 Minutes of Presentation, including Q&A
- 7) Author Presentation: 15 Minutes of Presentation, including Q&A

### **◆ Poster Presentation**

- 1) Materials Provided by the Conference Organizer: The place to put poster
- 2) Materials Provided by the Presenters: Home-made Posters
- 3) Maximum poster size is A1
- 4) Load Capacity: Holds up to 0.5 kg

### **◆ Best Presentation Award**

One Best Oral Presentation will be selected from each presentation session and awarded after the session.

### **◆ Dress Code**

Please wear formal clothes or national representative clothing.

### **◆ Legal Disclaimer Notice**

To ensure that the meeting is carried out smoothly and efficiently in a safe environment, we make the following disclaimers:

- First, the participants must wear the conference name tag to enter the conference areas during the entire conference. Individuals not wearing it will not be denied entry. Participants are not allowed to bring their associates or families into the conference areas. If you wish to bring someone, please inform the conference person in charge in advance to obtain a special name tag for whatever event like presentations, breaks or meals.

- Second, participants should confirm that they have good physical, mental and psychological preparation to participate in the event.
- Third, all legal responsibilities and liabilities arising directly or indirectly from participants' activities during the event shall be borne by the participants themselves.
- Fourth, the conference area is public, so participants need to take care of their belongings at all times. All losses related to personal property will not be the responsibility of the event organizers and associations.

### ◆ **2019-nCoV Protection Tips**

- **Due to the outbreak of the 2019-nCoV, all participants are required to wear masks during the whole conference and keep a safe distance when you are talking (above 1m). If you don't have mask during conference date, please ask conference secretary for help at registration desk.**
- **When you enter the conference venue, please consciously check the temperature at the registration desk. If you feel unwell, please tell conference secretary before the conference starts.**

## **INTRODUCTIONS FOR KEYNOTE SPEAKERS**



**Prof. Raj Jain**  
**(IEEE Fellow, ACM Fellow)**  
**Washington University in St. Louis, USA**

Raj Jain is currently the Barbara J. and Jerome R. Cox, Jr., Professor of Computer Science and Engineering at Washington University in St. Louis. Dr. Jain is a Life Fellow of IEEE, a Fellow of ACM, a Fellow of AAAS, a recipient of 2018 James B. Eads Award from St. Louis Academy of Science, 2017 ACM SIGCOMM Life-Time Achievement Award, 2015 A.A. Michelson Award from Computer Measurement Group and ranks among the Most Cited Authors in Computer Science. Previously, he was one of the Co-founders of Nayna Networks, Inc - a next generation telecommunications systems company in San Jose, CA. He was a Senior Consulting Engineer at Digital Equipment Corporation in Littleton, Mass and then a professor of Computer and Information Sciences at Ohio State University in Columbus, Ohio. He is the author of ``Art of Computer Systems Performance Analysis," which won the 1991 ``Best-Advanced How-to Book, Systems" award from Computer Press Association.

**Speech Title:** *Extending Blockchains for Risk Management*

**Abstract:** Blockchains has found numerous applications in Fintech, Supply chains, and contracts because it is ideal distributed consensus where all nodes agree on the validity of transactions in a block without needing a central trusted party. In this talk, Prof. Jain will present recent extensions by his team that allow blockchains to be used for group decisions that may not be binary. In this era of big data, we need to move blockchains beyond data storage to provide knowledge. Blockchains can be used for group decision making and risk management when the group sizes are large, and group members may want to remain anonymous. Prof. Jain will describe numerous use cases of this idea. Such situations frequently arise in network security and risky investments.





**Prof. Freimut Bodendorf**  
**University of Erlangen-Nuremberg, Germany**

Freimut Bodendorf (born in 1953) studied computer science at the Faculty of Engineering at Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU) from 1972 to 1978. After completing his doctoral degree in 1981 at FAU's School of Business and Economics, he was head of the Department of Documentation and Data Processing at the Faculty of Medicine at the University of Freiburg from 1982 to 1984. He then held positions as professor of information systems at Technische Hochschule Nürnberg Georg-Simon-Ohm and full professor of computer science and information systems at the Faculty of Computer Science of the University of Fribourg, Switzerland. He has been offered positions at the universities of Lüneburg, Koblenz and St. Gallen, which he declined. Professor Bodendorf has been Chair of Services, Processes, and Intelligence at FAU since 1990.

His research in these three areas focuses on topics such as service innovation and management, industrial services, company strategies, collaborative process management, business intelligence, big data and social media analytics.

**Speech Title:** *Future of Retail in the Era of E-Commerce*

**Abstract:** Digital transformation is heavily influencing the sales channels in virtually all industries. Above all, the sales volumes of e-commerce are skyrocketing. In contrast, the retail sector is running into problems. Here, e-commerce is a competitive factor of growing importance. Stationary shops are wrestling for loyal customers and trying to be more attractive for potential buyers. One promising approach is to link the real world up with the digital world. On the one hand, retail tries to reinforce its position within the customer journey in an omnichannel context. On the other hand, retailers try to integrate digital technologies into their stores, e. g., to provide a new level of service quality around the goods to be sold. In addition, attempts are made to gain more information about customer preferences and behaviors in the course of the customers' micro-journeys inside the store. However, this is more challenging than monitoring click-streams in a webshop. The presentation will touch these aspects of digital transformation in the retail industry and show high-tech examples to foster service fascination and improve customer insight in a store context.



**Prof. Wenbing Zhao**  
**Cleveland State University, USA**

Wenbing Zhao received his Ph.D. in Electrical and Computer Engineering at University of California, Santa Barbara, in 2002. Dr. Zhao has a Bachelor of Science degree in Physics in 1990, and a Master of Science degree in Physics in 1993, both at Peking University, Beijing, China. Dr. Zhao also received a Master of Science degree in Electrical and Computer Engineering in 1998 at University of California, Santa Barbara. Dr. Zhao joined Cleveland State University (CSU) faculty in 2004 and is currently a Professor in the Department of Electrical Engineering and Computer Science (EECS) at CSU. Dr. Zhao has authored a research monograph titled: “Building Dependable Distributed Systems” published by Scrivener Publishing, an imprint of John Wiley and Sons. Furthermore, Dr. Zhao published over 200 peer-reviewed papers in the area of distributed systems (three of them won the best paper award), smart and connected health, physics, and education. Dr. Zhao’s research is supported in part by the US National Science Foundation, the US Department of Transportation, Ohio State Bureau of Workers’ Compensation, Ohio Department of Higher Education, and by Cleveland State University. Dr. Zhao is currently serving on the organizing committee and the technical program committee for numerous international conferences. He is an Associate Editor for IEEE Access and for MDPI Computers. Dr. Zhao is a senior member of IEEE and a senior member of International Economics Development and Research Center (IEDRC).

**Speech Title:** *Secure Hierarchical Processing and Logging of Sensing Data and IoT Events with Blockchain*

**Abstract:** Recently, we have seen increasing popularity of using the blockchain technology to secure sensing data generated by traditional wireless sensor networks and Internet of Things (IoT). One of the biggest obstacles for integrating the IoT and blockchain technologies is the limited throughput of the current distributed ledgers. In this paper, we propose a novel method for hierarchical processing and logging of potentially large amount of sensing data with the blockchain technology, which could drastically address the issue of limited throughput in blockchains. Depending on the scale of the sensing need, two or more levels of processing and logging could be involved, where only the highest level of summative sensor data are placed on the blockchain or a secure distributed ledger. By establishing a strong linkage between different level of data, all lower-level and raw data are also made immutable once the highest level of summative data are placed on the blockchain.

## CONFERENCE TIME SCHEDULE

### Day 1(March 12, 2020): Onsite Registration

<b>Onsite Registration</b>		
<b>The Classroom</b>	10:00-17:00	<b>Registration &amp; Conference Materials Collection</b>

### Day 2 (March 13, 2020): Keynote Speeches and Author Presentations

<b>The Moanahoku Hall</b>	09:00-09:05		<p>Opening Remarks  <b>Prof. Emmeline dePillis</b>                      University of Hawaii at Hilo, USA</p>
	09:05-09:45 (Online Speech)		<p>Keynote Speech 1  <b>Prof. Raj Jain</b>                      (IEEE Fellow, ACM Fellow)                      Washington University in St. Louis, USA                      Speech Title:  <i>Extending Blockchains for Risk Management</i></p>
9:45-10:00		<b>Coffee Break &amp; Photo Session</b>	
<b>The Moanahoku Hall</b>	10:00-10:30		<p>Welcome  <b>Chancellor Bonnie Irwin</b>                      University of Hawaii at Hilo, USA</p>
	10:30-11:10		<p>Keynote Speech 2  <b>Prof. Freimut Bodendorf</b>                      University of Erlangen-Nuremberg, Germany                      Speech Title:  <i>Future of Retail in the Era of E-Commerce</i></p>
	11:10-11:50		<p>Keynote Speech 3  <b>Prof. Wenbing Zhao</b>                      Cleveland State University, USA                      Speech Title:  <i>Secure Hierarchical Processing and Logging of Sensing Data and IoT Events with Blockchain</i></p>

<b>Sky Garden Restaurant at 'Imiloa</b>	12:00-13:30	<b>Lunch</b>
<b>The Classroom</b>	13:30-15:45	<p><b>Session 1</b>                      Theme: <b>Blockchain Fundamentals</b>                      Session Chair:  <b>Bradley D. Taylor</b>                      The Catholic University of America, USA</p>
<b>The Moanahoku Hall</b>	13:30-15:15	<p><b>Session 2</b>                      Theme: <b>Business Economy</b>                      Session Chair:  <b>Dwight Edward Denman</b>                      Eastern Oregon University, United States</p>
15:30-16:00		<b>Coffee Break</b>
<b>The Classroom</b>	15:45-17:30	<p><b>Session 3</b>                      Theme: <b>Blockchain Applications</b>                      Session Chair:  <b>Wenbing Zhao</b>                      Cleveland State University, USA</p>
<b>Sky Garden Restaurant at 'Imiloa</b>	18:00-20:00	<b>Dinner</b>

**Day 3 (March 14, 2020): Social Program**

\*Note: The academic visit is optional, which will be arranged when participants booked.



**Rainbow Falls**

The Rainbow Falls in Hilo are a good place to visit early in the morning. This broad waterfall in the Wailuku river is conveniently located within Hilo town. It cascades over a lava cave that according to legends is home to the ancient Hawaiian goddess Hina, the goddess of the moon.

The waterfall itself is a modest 80 ft high, which is not that high compared to the nearby, 422 ft, 'Akaka falls. You can only see rainbow that is caused by sunlight when you are standing with your back towards the sun. This is because rainbows are caused by reflection, refraction and dispersion of light in water droplets (find out more about rainbows). The water droplets in this case don't come from rain, but from all the small water droplets that surround the falling water! The viewing area for the rainbow falls is east of the falls. If you want to have the sun in your back while you look at the falls, you need to do so in the morning because the sun rises in the east. So, to see the best rainbows you should arrive early on a sunny morning.



**Hawaii Volcanoes National Park**

Hawai'i Volcanoes National Park displays the results of at least 70 million years of volcanism, migration, and evolution in the Hawaiian Island-Emperor Seamount chain-processes that would thrust a bare land from the sea and clothed it with complex and unique ecosystems and a distinct human culture. Created to preserve the natural setting of Kīlauea and Mauna Loa, the park is also a refuge for the island's native plants and animals and a link to its human past. Park managers and scientists work to protect the resources and promote understanding and appreciation of the park visitors. Research by scientists at the Hawaiian Volcano Observatory makes Kīlauea one of the best understood volcanoes in the world, shedding light on the birth of the Hawaiian Islands and the beginnings of planet Earth. Each eruption is a reminder of the power of natural processes to change the air we breathe, the ground we walk on, and the sea that surrounds this volcanic island we call home.



**Mauna Loa Solar Observatory**

MLSO, Mauna Loa Solar Observatory is an observatory that collects images of the sun on the 11,000-foot slope of Mauna Loa volcano in the Hawaii islands. MLSO is operated by the high latitude observatory, a branch of the international center for atmospheric research. The observatory's job is to monitor the sun's atmosphere and record plasma and high-energy radiation coming from the chromosphere and corona, and the study of coronal mass ejections (CMEs) is an ongoing MLSO project. MLSO's instruments record images of the sun's surface and edges several times a day.

## **AUTHORS' PRESENTATIONS REVIEW**

### ***Session 1: Blockchain Fundamentals***

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***Time: 13:30-15:45***

***Conference Room: The Classroom***

CR0029 13:30-13:45	Volatility Reducing Effect by Introducing a Price Stabilization Agent on Cryptocurrencies Trading <b><i>Kyohei Shibano</i></b>
CR0040 13:45-14:00	A Strategy for Mitigating Denial of Service Attacks on Nodes with Delegates Account of Lisk Blockchain <b><i>Davi Lima Alves</i></b>
CR0002 14:00-14:15	Trust through Digital Technologies: Blockchain in Online Consultancy Services <b><i>Lars Heim</i></b>
CR0045 14:15-14:30	Blockchain Enabled IoT Edge Computing - Addressing Privacy, Security and other Challenges <b><i>Pankaj Mendki</i></b>
CR0044 14:30-14:45	Attribute-based Access Control of Data Sharing Based on Hyperledger Blockchain <b><i>Afnan M Alniamy</i></b>
CR0043 14:45-15:00	Towards Trustworthy and Independent Data Marketplaces <b><i>Sebastian Lawrenz</i></b>
CR0003 15:00-15:15	A Hierarchical Trust Management Architecture based on Blockchain for Crossover Service <b><i>Lijun Wei</i></b>
CR0005 15:15-15:30	Blockchain for IoT Devices (BIoT): Design, Scalability and Prototyping <b><i>Fabiha Hashmat</i></b>
CR0015 15:30-15:45	Secure Decentralized Machine Identifiers for Internet of Things <b><i>Chengnian Long</i></b>

### ***Session 2: Business Economy***

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***Time: 13:30-15:15***

***Conference Room: The Moanahoku Hall***

CR3001-A 13:30-13:45	South Dakota vs. Wayfair Case: A Boost for Brick-and Mortar Businesses and State Coffers or the Bane of Online Business Development? <b><i>Dwight Edward Denman</i></b>
CR2010 13:45-14:00	The Business Cost of Online Defamation <b><i>Margaret Vroman</i></b>
CR3013-A 14:00-14:15	The Determinants of International Students' Decisions to Remain to Work after Graduation in Japan? <b><i>Nguyet Thi Khanh Cao</i></b>

CR2001 14:15-14:30	How Mediation and Arbitration Can be Effective in the Kuwaiti Capital Market and the Kuwaiti Economy: Models of ADR around the World <i>Abdulaziz M N M Alshbib Almutairi</i>
CR3015-A 14:30-14:45	How to increase female managers? - Gender diversity as a corporate-level strategy <i>Tomo NISHIMURA</i>
CR3022-A 14:45-15:00	The Entropy of Marketing Narrative Interpretation <i>Ioannis Pantzalis</i>
CR3008-A 15:00-15:15	Country Risk Analysis for Particular International Investment Decision Makers <i>Li Yan</i>

**Session 3: Blockchain Applications****24****Time: 15:45-17:30****Conference Room: The Classroom**

CR0041 15:45-16:00	Data Protection Method with Blockchain against Fabrication of Video by Surveillance Cameras <i>Ryuya Uda</i>
CR0014 16:00-16:15	Proof-of-Concept (PoC) of Land Mortgaging Process in Blockchain-based Land Registration System of Thailand <i>Suporn Pongnumkul and Chantri Polprasert</i>
CR0042 16:15-16:30	A Blockchain to Establish Sustainability? <i>Sebastian Lawrenz</i>
CR0013 16:30-16:45	An Improved Consensus Mechanism for the Blockchain Based on Credit Rewards and Punishments <i>Jin Yan</i>
CR0016 16:45-17:00	Blockchain Analysis Tool of a Cryptocurrency <i>Sebastian Lawrenz</i>
CR0022 17:00-17:15	A Hierarchical Blockchain-based Data Service Platform in MEC Environments <i>Shau-Hsien Chiang</i>
CR0006 17:15-17:30	Block-SMPC: A Blockchain-based Secure Multi-party Computation for Privacy-Protected Data Sharing <i>Yuhan Yang</i>

## AUTHORS' PRESENTATIONS (MAR. 13, 2020)

### Session 1

Time: **13:30-15:45**

Conference Room: **The Classroom**

Theme: **Blockchain Fundamentals**

Session Chairs: **Bradley D. Taylor**

The Catholic University of America, USA

\*The time slots assigned here are only tentative. Presenters are recommended to stay for the whole session in case of any absence.

<p>CR0029 13:30-13:45</p>	<p>Volatility Reducing Effect by Introducing a Price Stabilization Agent on Cryptocurrencies Trading <b>Authors:</b> Kyohei Shibano, Ruxin Lin and Gento Mogi <b>Presenter:</b> Kyohei Shibano The University of Tokyo, Japan</p> <p><b>Abstract:</b> Cases of introducing token economy in designs of ICT services are increasing. Users in the early stages of the service are expected to participate in and be active in the service by expecting future price increases in that cryptocurrency. However, the volatility of cryptocurrencies is always intense, and the large volatility may cause users to be more interested in price changes than service activities, which diminishes the incentives for the service activities. In this study, in order to dampen the volatility of cryptocurrencies at the initial stage of their service launch, we assume the case where the service providers make bids to suppress the price changes based on the funds obtained from ICO, and conduct analysis using simulations in artificial market. In order to reproduce the actual price movement in the artificial market, we built an agent model that has the same stylized facts as the price movement of newly listed cryptocurrencies. Then, we introduced a price stabilization agent, and obtained a parameter set that reduces price volatility while suppressing the change in the slope of a simple linear regression compared to the original state using an optimization method. As a result, by introducing the price stabilization agent, we found a parameter set that can reduce the standard deviation of percentage changes by about 14% from the original price movement, and keep the slope of the simple linear regression trend at a 3.5% change.</p>
<p>CR0040 13:45-14:00</p>	<p>A Strategy for Mitigating Denial of Service Attacks on Nodes with Delegates Account of Lisk Blockchain <b>Author:</b> Davi Lima Alves <b>Presenter:</b> Davi Lima Alves UFBA, Brazil</p> <p><b>Abstract:</b> In this paper, I evaluate a type of denial of service attack, bandwidth depletion, that difficult the block propagation in blockchain networks. Towards the end, I study the attack on Lisk blockchain and explore its effects in the Delegated Proof of Stake consensus. I also propose a methodology joint with two tools I've created as countermeasures against such type of attack. The methodology is composed of the configuration of the same delegate account in more than one node joint with the use of created tools capable to detect the percentage of consensus on each monitored node and activate block forging status in a single node dynamically. Therefore, allowing a block to be forged even when the delegate account is under attack on another node and reducing the chance of forks creation on the blockchain with the same delegate account configured and activated on two or more nodes in the same forging time slot.</p>



<p>CR0002 14:00-14:15</p>	<p>Trust through Digital Technologies: Blockchain in Online Consultancy Services  <b>Authors:</b> Lars Erich Wolfgang Heim and Sebastian Gerth  <b>Presenter:</b> Lars Heim                  Clausthal University of Technology, Germany</p> <p><b>Abstract:</b> This paper examines the concept of trust in an increasingly digital society on the one hand and how it can be established with regard to digital documentation of online help services on the other. Trust is particularly important in the sector of digital services sector because requests and offers for help, and thus highly sensitive data, are offered, processed, and used on various online channels. With the advent of blockchain technology, there is a new central opportunity to create trust on digital platforms such as those used for online help services. After clarification of relevant concepts and terms, diverse forms of the blockchain technology are explained on the basis of the individually specific configuration of a blockchain. This results in a possible use of the technology for the area of digital services</p>
<p>CR0045 14:15-14:30</p>	<p>Blockchain Enabled IoT Edge Computing - Addressing Privacy, Security and other Challenges  <b>Author:</b> Pankaj Mendki  <b>Presenter:</b> Pankaj Mendki                  Talentica Software India Pvt Ltd, India</p> <p><b>Abstract:</b> The earlier version of this paper described blockchain enabled IoT edge computing architecture, where any compute resource owner can join the ecosystem and lend out the compute resources required for edge computing/analytics. This paper lists possible set of challenges implementing the above solution. The primary challenges are ensuring data privacy computation integrity when executing the computation remotely. The paper talks about current state research and possible practical implementation to address the privacy and integrity challenges. The paper also discusses other challenges related to payment and deployment aspects.</p>
<p>CR0044 14:30-14:45</p>	<p>Attribute-based Access Control of Data Sharing Based on Hyperledger Blockchain  <b>Authors:</b> Afnan Alniamy and Bradley D. Taylor  <b>Presenter:</b> Afnan M Alniamy                  The Catholic University of America, USA</p> <p><b>Abstract:</b> While public cloud service provides scholars a means to collaborate and share studies, depositing their data on a centralized semi-trusted cloud server managed by third party, raises security and privacy issues; secure decentralized storage can overcome this risky problem. In this paper, we propose an architecture model providing more fine-grained access control over the data stored in the cloud. Our proposed system is implemented by combining Hyperledger blockchain technology and Attribute-based Encryption (ABE) scheme to achieve this fine-grained access control of the shared files in decentralized environment. The implementation of the ABE prevents unauthorized users from accessing data and allows data owners to manage and control their data by encrypting shared data under an access control policy associated with a set of attributes. The Hyperledger blockchain assures the confidentiality and integrity of all stored files including key generation, policy assignment, and access request service. Our system prototype was implemented using chaincodes and tested on the Hyperledger Composer blockchain platform.</p>
<p>CR0043 14:45-15:00</p>	<p>Towards Trustworthy and Independent Data Marketplaces  <b>Authors:</b> Priyanka Sharma, Sebastian Lawrenz and Andreas Rausch  <b>Presenter:</b> Sebastian Lawrenz                  Clausthal University of Technology, Germany</p>

	<p><b>Abstract:</b> Data is the new oil. In the past years the awareness about benefits of data has increased. A growing number of sectors recognize the opportunities from data. On the one hand it is very difficult for many researchers and enterprises to obtain data and on the other hand for those who collect data, the problem is, how to draw to additional profit from the data beyond its obvious purpose. To tackle this problem, we propose a common data sharing platform, where the data producers can sell data and the others can consume it. Just like any other online marketplace a data marketplace is a platform which enables convenient buying and selling of products- in this case “data” . Blockchain enables businesses to be decentralized and more secure. Thus, in this paper we explore an approach to combine data marketplaces and blockchain for fair and independent data marketplaces.</p>
<p>CR0003 15:00-15:15</p>	<p>A Hierarchical Trust Management Architecture based on Blockchain for Crossover Service  <b>Authors:</b> Lijun Wei, Jing Wu and Chengnian Long  <b>Presenter:</b> Lijun Wei                  Shanghai Jiao Tong University, China</p> <p><b>Abstract:</b> As an emerging business model of the modern service industry (MSI), crossover service integrates services from enterprises and organizations in different fields. By combining computer and communication technologies, crossover service can improve the efficiency and quality of services. However, due to the complexity and heterogeneity among different industries, there still remain huge challenges regarding the service convergence process. One of the most important issues is the trust management in crossover services. The establishment of trust is the basic requirement of service convergence. In this paper, we first present the overview of crossover service and the issue of trust management by analyzing the specific application case of crossover service. Besides, based on blockchain technology, we will propose a decentralized trust management architecture to address the trust management issue in crossover service. The introduction of blockchain will significantly enhance the security of the crossover service. Moreover, a complete trust delivery relationship among different objects will be presented for the proposed trust management architecture. Finally, the feasibility of our proposed trust management architecture and the future research challenges will be illustrated in detail.</p>
<p>CR0005 15:15-15:30</p>	<p>Blockchain for IoT Devices (BIoT): Design, Scalability and Prototyping  <b>Authors:</b> Fabiha Hashmat, Rehan Ahmed, Umair Ahmed and Ali Hammad Akbar  <b>Presenter:</b> Fabiha Hashmat                  University of Engineering and Technology, Pakistan</p> <p><b>Abstract:</b> IoT devices have data that is critical to the operation of safety and security applications. Due to the unavailability of centralized infrastructure, the integrity of data has to be ascertained by the devices themselves. This turns out to be a challenge because of the multitude of security functions and mechanisms. Optimizing diverse security functions in the absence of dedicated infrastructure nodes such as AAA (Authentication, Authorization and Accounting) and CA, is not verifiable in terms of what is necessarily required and what is sufficient to business specific needs. In this work, we have proposed "Design and Prototyping of IoT Blockchains for Sensor Data Provenance" for providing Blockchain for IoT constrained devices. We have developed light scale and suitable Blockchain according to IoT devices which have constrained nature. We have added the necessary features related to IoT domain in the block header which are: Device Data, Device ID and Device Location. After that we have analyzed the blockchain by varying the key performance indicators of blockchain (block size and no. of transactions/ block) to calculate the throughput rate of our proposed Blockchain on a constrained device (Raspberry Pi 2 Model B). We have added a feature of entropy calculation for the data entered in the Blockchain so that we could optimize the storage the storage capacity of Blockchain by adding only entropy based sensor</p>

	data.
CR0015 15:30-15:45	<p>Secure Decentralized Machine Identifiers for Internet of Things <b>Authors:</b> Yang Su, Jing Wu, Chengnian Long and Lijun Wei <b>Presenter:</b> Chengnian Long Shanghai Jiao Tong University, China</p> <p><b>Abstract:</b> The digital identities of Internet of Things (IoT) devices are vital to the security of IoT system. However, current centralized identity management systems have many drawbacks such as the single point of failure, suffering DDoS attacks and privacy issues. In this paper, to solve the above problems, we combine with the scenario of electrical vehicles charging to present our decentralized machine identifier (DMID) and identity management scheme. The scheme is based on blockchain and InterPlanetary File System (IPFS) technologies. Moreover, to improve the security of DMID, we design a secure hardware module by employing Physical Unclonable Function (PUF), True Random Number Generation (TRNG) and Trustzone. At last, we design a simulation system, and the result demonstrates the feasibility and effectiveness of our proposed scheme.</p>

## Session 2

Time: **13:30-15:15**

Conference Room: **The Moanahoku Hall**

Theme: **Business Economy**

Session Chair: **Dwight Edward Denman**

Eastern Oregon University, United States

\*The time slots assigned here are only tentative. Presenters are recommended to stay for the whole session in case of any absence.

<p>CR3001-A 13:30-13:45</p>	<p>South Dakota vs. Wayfair Case: A Boost for Brick-and Mortar Businesses and State Coffers or the Bane of Online Business Development? <b>Author:</b> Dwight Edward Denman <b>Presenter:</b> Dwight Edward Denman Eastern Oregon University, United States</p> <p><b>Abstract:</b> On June 21, 2018, the United States Supreme Court issued its opinion in the South Dakota vs. Wayfair case. This decision has been anticipated by businesses who sell products and services online, state legislatures and administrators, and tax practitioners. The decision has caused a seismic shift in sales and use tax jurisprudence, reversing over 20 years of precedence that allowed certainty for remote online sellers of products or services. The decision has and will continue to have a marked impact on the expectations of both remote online sellers and state legislatures. This paper will begin by discussing prior case law to assist in understanding the issues involved. Next, this paper will discuss Congress’ attempts to fix the problems caused by these prior cases, followed by a discussion and analysis of the Wayfair case. In addition, the paper will discuss states’ post-Wayfair legislation. Finally, the paper will discuss unresolved issues and practical strategies for potential and existing remote online sellers going forward.</p>
<p>CR2010 13:45-14:00</p>	<p>The Business Cost of Online Defamation <b>Authors:</b> Margaret E Vroman, Karin Stulz, Claudia Hart and Kenneth Mullins <b>Presenter:</b> Margaret Vroman Northern Michigan University, United States</p> <p><b>Abstract:</b> The Internet has radically changed the way businesses and individuals communicate. Most people view this as a positive achievement and applaud the egalitarian ability of all to post online and locate information of interest. Along with these benefits, however, is the increasing damage done by those who post untrue business reviews, personal attacks and altered photos and videos. Interestingly, the average person will claim to support “freedom of speech” on the Internet – until they are the victim of a false accusation or hate speech.</p> <p>This paper examines when speech ceases to be “free” and crosses the line to defamation. It will discuss some of the laws that govern online defamation, provide situational examples and specify the costs incurred by victims of defamation. Finally, it will conclude with recommendations on how to proactively deal with potential defamation situations.</p>
<p>CR3013-A 14:00-14:15</p>	<p>The Determinants of International Students’ Decisions to Remain to Work after Graduation in Japan? <b>Author:</b> Nguyet Thi Khanh Cao <b>Presenter:</b> Nguyet Thi Khanh Cao Kwansei Gakuin University, Japan</p> <p><b>Abstract:</b> Using data from the survey conducted by the Japan Student Services Organization, we employed binary outcome models to investigate the determinants of international students’</p>

	<p>decisions: whether they want to remain in Japan to work after they finish their studies. The empirical results show that having a strong motivation to live in Japan before going there to study has a significant impact on decisions to remain and to work there. Moreover, the longer students stay in Japan, the more likely they are to remain there to work permanently. Based on the estimation results, the paper suggests that policy makers should consider carefully the student's studying motivation to attract more efficiently international students.</p>
<p>CR2001 14:15-14:30</p>	<p>How Mediation and Arbitration Can Be Effective in the Kuwaiti Capital Market and the Kuwaiti Economy: Models of ADR around the World  <b>Author:</b> Abdulaziz M N M Alshbib Almutairi  <b>Presenter:</b> Abdulaziz M N M Alshbib Almutairi  Kuwait University College of Law, Kuwait</p> <p><b>Abstract:</b> The golden rule in law is speedy justice. For much of the world's financial transactions, Alternative Dispute Resolution (ADR) is the preferred method for international companies no matter which countries are involved. Thus, businesses expect ADR as to be the status quo means of resolving conflicts concerning commerce such as contracts, sales and trade. In Kuwait, however, the norm for settlements remains litigation, a time consuming, costly and inefficient process which seems antiquated to global partners. This paper, written by a Kuwaiti J.S.D. candidate from Kuwait University College of Law, understands his country's hesitation to embrace procedures other than court trials for deciding legal outcomes for investments, and other enterprises. The author presents a compelling case for change directed to Kuwaiti legislators.</p>
<p>CR3015-A 14:30-14:45</p>	<p>How to Increase Female Managers? - Gender Diversity as a Corporate-level Strategy  <b>Author:</b> Tomo NISHIMURA  <b>Presenter:</b> Tomo NISHIMURA  Kwansei Gakuin University, Japan</p> <p><b>Abstract:</b> This study aims to explore how to narrow the gender gap in job promotion and whether or not reducing the gender gap could improve productivity at a corporate level. More specifically, we analyze which measures are more effective to increase female managers using the firm-employees surveys conducted in 2018 in Kansai region (Kansai is economically important area after Kanto region around Tokyo in Japan). We also examine whether reducing gender gap could result in increased productivity through corporate competitiveness power, appreciation from shareholders and women's moral improvement. Our provisional estimation results show (1) a certain sized female employees is needed to increase female managers, (2) New Act seems to be effective to a certain extent (The firms which respond to the New Act have a higher percentage number of women in managerial positions compared with their counterparts), and (3) experiencing a leading role and expectation from bosses can encourage women's ambition for promotion.</p>
<p>CR3022-A 14:45-15:00</p>	<p>The Entropy of Marketing Narrative Interpretation  <b>Author:</b> Ioannis Pantzalis  <b>Presenter:</b> Ioannis Pantzalis  Saint Leo University, United States</p> <p><b>Abstract:</b> Storytelling is one of the major ways that humans make sense of life. If life is one thing after another, stories is the way we connect them in a manner that provides a sense of coherence, a beginning, an end, and a causality in the way events are connected. Stories also provide the backbone of identity for individuals, organizations, businesses, brands, as well as countries. They provide a sense of not only how things happen, but why they happen and what they mean. They explain but also provide a sense of purpose and often a plan on</p>

	<p>how to proceed. Storytelling has become a key ingredient in marketing, and it is used in branding products, businesses, individuals, non-profits, ideologies, and countries. People today market themselves in the job market by establishing their personal brands and personal narratives are a key component. The key challenge in using stories is that ultimately their meaning is not fixed. Like in all of nature, there is an entropy process that changes the structure and the interpretation of every narrative over time. This article looks at this “social entropy” and identifies and analyzes the factors that contribute to it and the way it changes based on the environment that includes a network of competing as well as complementary narratives.</p>
<p>CR3008-A 15:00-15:15</p>	<p>Country Risk Analysis for Particular International Investment Decision Makers  <b>Authors:</b> Li Yan and Peiwen Gao  <b>Presenter:</b> Li Yan          Université du Québec en Outaouais, Gatineau (QC), Canada</p> <p><b>Abstract:</b> With the rapid development of economic globalization, country risk (CR) has become a hot issue because it is often a critical threat for overseas investment. CR represents a potentially negative impact of a country’s environment on foreign direct investment projects. CR may also be defined as exposure to a loss in cross-country transactions, caused by uncertainty in a given country, under or out of the control of the government of that country but not under the control of an individual of firm. It is measured with an index system classifying countries (regions) according to the political, economic and financial and social risks to do business in the host country. In the literature, all assessment models lead to CR classification in view of an “average” or representative investor who has “neutral” nationality or no nationality. Such theoretical frameworks are indeed generalized but less helpful in practical decision making since the investor’s particularity related to his nationality is ignored. In some cases, traditional CR models may be misleading just because of the ignorance of cultural differences and bilateral relationship between home and target countries. Foreign investors from different countries (or regions) may face some different risks, for instance, targeted discriminant policies during a trade war. For practical and specific guidance for cross-country investment decision making, the particularity involving the nationality of the foreign investor must be taken into account in CR analysis.</p> <p>In this paper, a new theoretical framework of CR assessment is proposed in the perspective of a given country, basically with incorporation of two particular dimensions: Bilateral Relations Risk (BRR) and Cultural Difference Risk (CDR). The BRR is measured basically by the event study method introduced by Yan and Zhou (2004). However, the measurement of bilateral relation of Yan and Zhou (2004) takes the relation as constant over time when there is no important event occurring. Such measurement seems unrealistic. We introduce a time variant attenuation factor to determine the current status of bilateral relationship as accumulated effect of historical events. To quantify the CDR, the Hofstede cultural dimension theory is applied. Based on six dimensions of culture, the CDR is defined by Mahalanobis metric, instead of Euclidean or normalized Euclidean metric used in most previous studies. This is because Mahalanobis metric takes the correlations between cultural dimensions into consideration. Furthermore, the CR complexity is partially studied, such as how political corruption varies with the economic growth and the cultural dimensions. We also propose an algorithm to aggregate the different categories of risks with hybrid neural network (HNN) model. This algorithm can provide objective weights of the risks and better performance in CR rating as well as in forecasting.</p>

### Session 3

Time: **15:45-17:30**

Conference Room: **The Classroom**

Theme: **Blockchain Applications**

Session Chairs: **Wenbing Zhao**

Cleveland State University, USA

\*The time slots assigned here are only tentative. Presenters are recommended to stay for the whole session in case of any absence.

<p>CR0041 15:45-16:00</p>	<p>Data Protection Method with Blockchain against Fabrication of Video by Surveillance Cameras  <b>Author:</b> Ryuya Uda  <b>Presenter:</b> Ryuya Uda                  Tokyo University of Technology, Japan</p> <p><b>Abstract:</b> In this paper, I propose a method for detecting violation of a regulation or an illegal action by surveillance cameras and for preventing fabrication of video records by the cameras. In this method, message digests of video records are signed and chained by blockchain for the integrity. There are some researches in which falsification of video is prevented by blockchain. However, in the researches, fabrication of the video is not considered. On the other hand, cameras are classified in terms of both reliability and security in my method for making trust chains of cameras against fabrication. In this paper, I also explain the condition for making the trust chains. A owner of a camera which shot violation of a regulation or an illegal action is rewarded with a fine for the violation or the penalty instead of bitcoin, and a signer of a chain is also rewarded. The proposed method can make areas safe with small cost and terminate false accusations by fabrication of video records.</p>
<p>CR0014 16:00-16:15</p>	<p>Proof-of-Concept (PoC) of Land Mortgaging Process in Blockchain-based Land Registration System of Thailand  <b>Authors:</b> Suporn Pongnumkul, Chanop Khonnasee, Swiss Lertpattanasak and Chantri Polprasert  <b>Presenters:</b> Suporn Pongnumkul and Chantri Polprasert                  National Electronics and Computer Technology Center, Thailand; Srinakharinwirot University, Thailand</p> <p><b>Abstract:</b> Land title deeds are important documents that can be used to verify ownership and transfer history of lands. In Thailand, the Department of Lands operates and facilitates the transfer of ownership and other operations related to lands. The current technology used in the operations often encounters problems with the reliability of operations and complexities that cause delays. This paper investigates a proof-of-concept (PoC) of the integration of blockchain in the land registration system to improve the reliability of storage and reduces the steps in the process. The process of loan contracts with banks is used in the PoC and an Ethereum-based private blockchain is developed and tested. Performance evaluation of our proposed system can handle at least 26 transactions per second over a range of a number of transactions of interest. The results show promising potential both in the reduction of process and the performance of blockchain for the proposed use case.</p>
<p>CR0042 16:15-16:30</p>	<p>A Blockchain to Establish Sustainability?  <b>Authors:</b> Sebastian Lawrenz, Vera Stein, Lukas Jacobs and Andreas Rausch  <b>Presenter:</b> Sebastian Lawrenz                  Clausthal University of Technology, Germany</p> <p><b>Abstract:</b> Nowadays, electronics/electrical appliances are becoming less and less appreciated. Due to ever shorter innovation cycles, especially in the field of consumer electronics, more and more electrical waste is being produced.</p>

	<p>Motivated by this fact we decided to give a group of students in one course called programming project course with this challenge. We introduced the problem there and further we introduced the blockchain technology in this course. The task for the student group was to design a blockchain based solution to reduce Waste Electrical &amp; Electronic Equipment (WEE) and so to improve sustainability. This paper reports about the programming project from the development process of the first ideas to the completion of running prototype and discusses the final results.</p>
<p>CR0013 16:30-16:45</p>	<p>An Improved Consensus Mechanism for the Blockchain Based on Credit Rewards and Punishments  <b>Authors:</b> Lixiang Li, Jin Yan, Haipeng Peng and Yixian Yang  <b>Presenter:</b> Jin Yan                  Beijing University of Posts and Telecommunications, China</p> <p><b>Abstract:</b> In the traditional Proof of Stake (PoS), the share of the currency owned by the node, that is, the share of the equity, determines the probability that the node is selected as the representative node. In each round of the block generation, a node is selected as the creator of the next block by the verification, and the selected creator will pack appropriate transactions into the block and publish it on the blockchain. However, in the network with poor synchronization, the traditional PoS produces multiple verified representative nodes in each round, which generates multiple blocks. Then the blockchain is easy to produce the bifurcation. Aiming at the bifurcation problem of PoS, we propose an improved voting method based on credit rewards and punishments to vote on multiple blocks. The block is selected by considering the credibility of the creator, the count of the obtained comprehensive votes and the transaction value of the block. Thereby it can ensure the consistency and the fairness of the blockchain network. In the same time, the malicious node is found and voted to be removed in time by counting the number of invalid blocks generated by the nodes. It can ensure the security of the blockchain network.</p>
<p>CR0016 16:45-17:00</p>	<p>Blockchain Analysis Tool of a Cryptocurrency  <b>Authors:</b> Robert Werner, Sebastian Lawrenz and Andreas Rausch  <b>Presenter:</b> Sebastian Lawrenz                  Clausthal University of Technology, Germany</p> <p><b>Abstract:</b> In recent years, cryptocurrencies have become more and more popular and the growing adoption has led to an increasing number of financial transactions being stored on the blockchain. Although cryptocurrencies have built a reputation as an anonymous means of payment, they are usually rather pseudonymous, transparent and everlasting logbooks about financial transactions, which are publicly available. Thus, analyzing a crypto address can reveal payment partners, money flows, behavior patterns and more. In this work, a program is presented, which provides an analysis of this kind and displays the results in a simple format. The technical properties of the blockchain that this analysis is based on are explained. This paper explains the possible impact of total transparency on the blockchain and our tool on our society.</p>
<p>CR0022 17:00-17:15</p>	<p>A Hierarchical Blockchain-based Data Service Platform in MEC Environments  <b>Authors:</b> I-Hsun Chuang, Shau-Hsien Chiang, Wei-Chu Chao, Shih-Hao Huang, Bai-Lin Zeng and Yau-Hwang Kuo  <b>Presenter:</b> Shau-Hsien, Chiang                  National Cheng Kung University, Taiwan</p> <p><b>Abstract:</b> Recently, data service companies analyzing IoT data to provide valuable knowledge emerge as a promising business model. To sustain such business model, the establishment of a data service platform for IoT data sharing and data service delivery becomes a necessity. Today, blockchain-based platforms are believed to be reliable but have poor system performance, considerable storage overheads and high energy consumption. MEC technology is then applied</p>



	<p>to help IoT devices participate in the blockchain network. However, the considerable loading of blockchain operations turns MEC hosts into a performance bottleneck, instead. Therefore, this paper exploits the hierarchical blockchain architecture in the proposed IoT data service platform, called HB-IoDS, to significantly reduce the storage overheads and service providing time. Furthermore, to alleviate the heavy burdens on MEC hosts, HB-IoDS provides the adaptive Proof-of-Work (APoW) consensus algorithm that derives an appropriate difficulty to achieve PoW condition according to device capability. By this mean, resource-constrained IoT devices can also perform blockchain operations which are usually regarded as energy-consuming. Finally, simulation results show that HB-IoDS outperforms existing blockchain-based platforms in terms of system performance, energy consumption, and storage costs. As a result, the proposed HB-IoDS is the most practical IoT data service platform.</p>
<p>CR0006 17:15-17:30</p>	<p><b>Block-SMPC: A Blockchain-based Secure Multi-party Computation for Privacy-Protected Data Sharing</b>  <b>Authors:</b> Yuhan Yang, Lijun Wei, Jing Wu and Chengnian Long  <b>Presenter:</b> Yuhan Yang  Shanghai Jiao Tong University, China</p> <p><b>Abstract:</b> With the rapid development of Internet of Things, the demand of data sharing is not only to ensure the data integrity, but also to protect user's individual privacy. Secure multi-party computation, as a technology paradigm based on cryptography technology, enables privacy protection in data sharing among multiple parties, while the implement of secure multi-party computation is limited due to the inefficient, complex computation protocol and frequent interaction. Fortunately, the emergence of blockchain technology provides excellent properties of decentralization, verifiability and high reliability for secure multi-party computation. In this paper, we propose a blockchain-based secure multi-party computation architecture for data sharing, where we design an aggregator consortium for data storage, verification and joint computation. Moreover, we introduce a straightforward secure multi-party computation scheme based on homomorphic encryption. In addition, we analyze and discuss this scheme in terms of data security, access flexibility, attack resistance and potential applications.</p>

## POSTER SESSION

**Venue: The Moanahoku Hall, Time: 15:30-17:30 on March 13, 2020**

<p>CR0025</p>	<p>Application of Block Chain Technology in Constructing Network Threat Intelligence System  <b>Authors:</b> Shichang Xuan, Hao Tang, Wei Wang and Wu Yang                  Harbin Engineering University, China</p> <p><b>Abstract:</b> At present, the threat situation in cyberspace is more and more serious, and there are many attack methods in cyberspace. It is urgent to build a healthy and efficient cyber threat intelligence ecosystem. At the same time, strengthening the cooperation and mutual assistance of various information systems and creating a widely Shared and fully interconnected information sharing environment can maximize the value of threat intelligence and improve the capabilities of threat detection and emergency response of all parties. However, it is easy for many researchers and organizations to conduct intelligence collection in their own way to form information islands, which limits the active flow of information among organizations. In recent years, block chain has attracted extensive attention in the field of distributed records and immutable transactions. In this paper, a network threat intelligence sharing platform based on block chain technology is built based on the characteristics of block chain. Through our experiments, the network threat intelligence system based on block chain technology proposed in this paper can collect more diversified and larger quantities of network data under the condition of ensuring security and privacy, and improve the efficiency of sharing network threat intelligence data across organizations.</p>
<p>CR0028</p>	<p>The Wireless Charging Pavement System of Electric Vehicles Based on Block Chain  <b>Authors:</b> Fengxin Zhang, Huiyan Shen, Dongle Wang and Junping Xiang                  Lianyuangang Jari Electronics co., LTD, China</p> <p><b>Abstract:</b> The current charging mode of electric vehicles is to adopt fixed charging piles. There are a series of problems in this charging mode, such as low penetration rate of charging piles, high failure rate of charging piles, long waiting time in queue, and long charging time. In this paper, we introduce a set of road system which can support the wireless charging of electric vehicles without parking. And it is composed of vehicle unit, wireless charging road module, communication link, and cloud billing system as well as operation and maintenance system centering on block chain. The advantages of the system are that the vehicle can be charged at any time while driving, the wireless charging road module has high compatibility, and the charging transaction information is stored in the cloud block chain. Under the premise of ensuring the safety of the transaction information, the transaction data can be fully shared.</p>
<p>CR0027</p>	<p>The Fit of Blockchain into Rural Financial Management Accountability in Indonesia  <b>Authors:</b> Dumaria - Simanjuntak, Retno - Saraswati and Reny Yemimalina Sinaga                  Diponegoro University, Indonesia</p> <p><b>Abstract:</b> Weak accountability, lack lack of civic participation, complex hierarchies in managing the revenue sources of the rural area, away from the control of the central government, and minimum transparencies, has massively resulted in corruption and fraud in the financial management of the rural area. Even though there have been many stakeholders involved in managing and overseeing rural area finances. Stakeholder theory that attempts to solve three interconnected problems (how to create value, how to relate it to ethics, and how to change the managerial mindset to harmonize values and ethics) to be the basis for justifying the use of blockchain technology. The findings of this study indicate that blockchain technology has not been regulated as a necessity for engaging in rural area financial management. Other findings confirm that the blockchain is very feasible in establishing</p>

	<p>accountability in managing rural area finances through the moral obligation of stakeholders' active participation.</p>
CR0034	<p>Can the Issue of Invoice Reimbursement in China be Solved Completely through the Integration of Blockchain and IoT Technology?  <b>Authors:</b> Liu Feng, Luo Jingyi, Li Aohua, Lv Yifan, Qin Sishi, Wu Xuanyon and Wang Ningbo  Shanghai University of International Business and Economics, China</p> <p><b>Abstract:</b> In order to achieve the automatic and non-inductive reimbursement of invoices and eliminate the various inconveniences as well as risks caused by artificial reimbursement, this paper creatively combines blockchain technology with electronic invoices. This system realizes interactive flows of paperless invoice for each node from consumption, reimbursement to tax payment through the blockchain network system. Based on the Internet of things technology, the off-chain data can be automatically processed and connected to the on-chain seamlessly. Meanwhile, using a dual-chain structure ensures the subsequent identification and business separation. Through the combination of theory and technical framework, the non-inductive invoice reimbursement system is constructed to reduce the overall reimbursement costs and promoting the improvement of the taxation system in China.</p>
CR0008	<p>A Review on Scalability of Blockchain  <b>Authors:</b> Di Yang, Han Xu, Chengnian Long and Shaoliang Peng  National University of Defense Technology, China</p> <p><b>Abstract:</b> As one of the key technologies of distributed ledgers, blockchain solves the trust problem in open network without relying on any trusted third party. Its decentralized feature has a broad application prospect, but still faces scalability problem. Currently, blockchain scalability bottleneck is mainly in three aspects: performance inefficiency, high confirmation delay, and function extension. For example, Bitcoin can only deal with 7 transactions per second averagely. Obviously, it cannot meet the requirement of current digital payment scenarios, nor can it be carried in other applications such as distributed storage and credit service. What's more, different blockchain systems carry different business and requirements, so scalability is the core issue of the current development of blockchain. This paper introduces the blockchain scalability related technologies from the aspects of improving efficiency and extending functionality of blockchain system, respectively. We summarize four mainstream solutions to improve the performance of blockchain system, including Sharding mechanism, directed acyclic graph based (DAG-based), off-chain payment network and cross-chain technology. In the end, we give some suggestions for further research in blockchain scalability.</p>
CR0030	<p>Blockchain Adoption for Plea Bargaining of Corporate Crime in Indonesia  <b>Authors:</b> Henry Dianto P. Sinaga and Andhy Hermawan Bolifaar  University of Diponegoro, Indonesia</p> <p><b>Abstract:</b> The rise of corporate crime cases now shows that the handling has not found the right model, even though so far there has been a concept of legal settlement outside the court, otherwise known as plea bargaining. In addition to those who support, there are criticisms of the use of plea bargaining (such as too much discretion of prosecutors in plea bargaining, lack of legal substance that limits the possibility of abuse of authority by law enforcement officials, and the possibility of guilty plea not yet actual), but this criticism can be refuted through the use of blockchain technology in the mechanism of plea bargaining. In Indonesia, the regulation of the bargaining of corporate crime plea is still limited to the draft law. In fact, the draft is still not in accordance with the spirit of plea bargaining itself, such as the defendant whose plea bargaining application was received must still be tried through a short event</p>

	<p>examination, it does not regulate which types of criminal acts are categorized as special lines, bidding restrictions or negotiations between the defendant and the claimant general, and what form of waivers or rewards or concessions can be offered by public prosecutors. This shows the importance and urgency to build a transparent, efficient, fast and inexpensive plea bargaining model in Indonesia through the use of blockchain technology. In addition, the use of blockchain technology can provide adequate outputs and outcomes in dealing with corporate crime, because any data, information, complaints, and reports that are inputted based on each block will be automatically integrated into the fairness, legal certainty, and public benefit values as an independent and accountable decision-making tool for the authorities.</p>
<p>CR0033</p>	<p>An Anonymous Transmission Algorithm Named Ripple Spreading for Blockchain  <b>Authors:</b> Yongwang Zhou, Zhuchao Yu, Yixiao Lan, Yuxin Guo and Ruinan Chen                  Northeastern University, China</p> <p><b>Abstract:</b> The emergence of blockchain technology profoundly reflects the importance of anonymity in personal data and personal identity. In this paper, we propose an anonymous transmission algorithm named ripple spreading specialized in anonymous payment in the blockchain network. The algorithm achieves the purpose of anonymous transmission by transmitting verification while jumping among multiple nodes, thereby, overcomes the defect of the lack of covert channel characteristics under the web environment. We firstly demonstrate the framework of our algorithm. Subsequently, we illustrate the converging and merging process of transmission in detail, and lastly, give a quantitative evaluation of this algorithm. The result of the experiment shows that once the number of paths as well as the average path length reaches a threshold, our algorithm can solve the main problem of anonymous transmission to a great extent and improve the anonymity function significantly.</p>
<p>CR0010</p>	<p>Volatility Spillovers between US Banking Industry and Bitcoin Market: Risk Implications for Banking Industry  <b>Authors:</b> Chamil W Senarathne and Wei Jianguo                  Wuhan University of Technology, China</p> <p><b>Abstract:</b> This paper examines the volatility spillovers between Bitcoin market and US banking industry using unrestricted BEKK-GARCH model. The results show that there is a strong short-term volatility spillover effect in the two markets. The results show that there is a strong short-term volatility spillover effect in the two markets. However, Bitcoin trading volatility process weakens the short-term volatility spillover effect from Bitcoin market to banking industry in the United States and the volatility of banking industry returns (i.e. volatility of operational results) weakens the short-term volatility spillover effect from banking industry to Bitcoin market. Moreover, there is a significant and (positive) long-term volatility spillover effect from Bitcoin market to banking industry. This remarkable observation reveals that there is a possibility of banking industry adopting Bitcoin operation as a part of banking product portfolio development. As such, imposition of any tax or trading restriction (e.g. price bands, transaction cost, tax etc.) on Bitcoin market will adversely impact the performance of banking industry in the long-run. The nature of the impact and its timing are of utmost importance for the government and policymakers, particularly in case of economic planning and restructuring of banking and financial services industry.</p>
<p>CR0020</p>	<p>Secure Hierarchical Processing and Logging of Sensing Data and IoT Events with Blockchain  <b>Authors:</b> Wenbing Zhao, Sunkun Yang and Xiong Luo                  Cleveland State University, USA</p> <p><b>Abstract:</b> Recently, we have seen increasing popularity of using the blockchain technology to secure sensing data generated by traditional wireless sensor networks and Internet of Things</p>

	<p>(IoT). One of the biggest obstacles for integrating the IoT and blockchain technologies is the limited throughput of the current distributed ledgers. In this paper, we propose a novel method for hierarchical processing and logging of potentially large amount of sensing data with the blockchain technology, which could drastically address the issue of limited throughput in blockchains. Depending on the scale of the sensing need, two or more levels of processing and logging could be involved, where only the highest level of summative sensor data are placed on the blockchain or a secure distributed ledger. By establishing a strong linkage between different level of data, all lower-level and raw data are also made immutable once the highest level of summative data are placed on the blockchain.</p>
CR0024	<p>Research on Application of Blockchain Technology in Cloud-Network Collaboration  <b>Authors:</b> Min Tan, Guo-hui Li, Ming Wei, Fei Huang, Li Zhang and Xiang Hu  Huazhong University of Science and Technology, China; Wuhan Fiberhome Technical Services Co., Ltd., China</p> <p><b>Abstract:</b> With the deep integration of blockchain, cloud computing and 5G technology, the business model of the Internet is also undergoing subversive changes. Based on the current development trends of the industry, this article illustrates the application prospects of blockchain technology in cloud-network collaboration. For users to purchase network services, blockchain technology and consensus accounting are adopted to effectively avoid uploading user data to the Internet company's cloud server, thereby protecting user privacy from threats. This article provides a solution that uses blockchain technology in cloud-network collaboration to ensure transaction security. At the same time, it analyzes the consensus mechanism for the actual application scenario, and selects a consensus mechanism which is suitable for the cloud-network collaborative application scenario.</p>
CR0001	<p>Blockchain-based Automatic Indemnification Mechanism Based on Proof of Violation for Cloud Storage Services  <b>Authors:</b> Gwan-Hwan Hwang, Pei-Chun Tien and Yi-Hsiang Tang  National Taiwan Normal Univ., Taiwan</p> <p><b>Abstract:</b> In this paper we propose a blockchain-based automatic indemnification mechanism. Clients and service providers (SPs) exchange signed messages according to a predefined protocol that enables clients to utilize service-provider services with simultaneous cryptographic proof of service. When a client has discovered an SP to have violated a service level agreement based on cryptographic proof, then they can obtain cryptocurrency as a compensation by raising objections to a smart contract on a public blockchain. When an objection has been judged successful by programs located in the smart contract, a portion of the deposit (cryptocurrency in the smart contract) will be transferred to the account of the objection-raiser. In this way, the need to establish and run a customer service center with employees for processing such claims and refunds is obviated. Moreover, the traditional third-party trust is no longer needed. Focusing on services for cloud-storage service, we propose protocols and implementation of an indemnification system in the Ethereum. The feasibility of the proposed application has been demonstrated through pilot implementation and testing.</p>
CR0031	<p>Blockchain for Data Science  <b>Authors:</b> Jiameng Liu, Shaoliang Peng, Chengnian Long, Lijun Wei and Yunhao Liu  Hunan University, China</p> <p><b>Abstract:</b> Nowadays, the development of social information and network leads to the explosive growth of data. The increasing amount and diversity of data have also encouraged researchers to make business decisions by analyzing the big data generated. This has also</p>

	<p>caused the rapid development of the data science industry. However, there are still many challenges to be solved, especially data security and privacy. Data security and privacy threat permeate every link of data science industry chain, such as data production, collection, processing and sharing, and the causes of risk are complex and interwoven. Blockchain technology is highly praised and recognized for its decentralized infrastructure, anonymity, security and other characteristics. It will change the way we access and share information. We believe that blockchain technology can overcome some limitations in data science and promote the development of data science, but it may also bring some other problems. Therefore, it is necessary to explore the relationship between blockchain technology and data science. In this paper, we investigate the researches and applications of blockchain technology in the field of data science and give the potential advantages and challenges that blockchain technology may bring to data science.</p>
CR0011	<p>A Blockchain-Based Privacy-Preserving Scheme for Smart Grids  <b>Authors:</b> Xin Chen, Jiachen Shen, Zhenfu Cao and Xiaolei Dong  East China Normal University, China</p> <p><b>Abstract:</b> The application of smart grids helps optimize electric dispatching and troubleshoot power interruption. Although it provides convenience to our lives, it also causes certain security risks. At present, open wireless sensor network is adopted in smart grids and is vulnerable to cyber attacks, resulting in network congestion and leakage of users' private information. Therefore, an attacker may infer users' identities, behavior and preferences by analyzing the real-time power consumption, which is an immediate threat to the users' privacy. To address this issue, we propose a privacy-preserving scheme based on blockchain and group signature to protect the privacy of users' identities while enhancing the security of power systems. On one hand, smart meters serve as nodes in the blockchain system and ensure data consistency through consensus mechanism. On the other hand, as group members, smart meters make sure of the anonymity of end-users by generating group signatures for power data. Security analysis shows that, our scheme achieves security in terms of privacy preserving, transaction verification and traceability, and is secure against common cyber attacks. In addition, the performance analysis shows that the proposed scheme is practical in the sense of consensus delay and throughput.</p>
CR1002	<p>Blockchain Based Digital Evidence Chain of Custody  <b>Authors:</b> Wenqi Yan, Jiachen Shen, Zhenfu Cao and Xiaolei Dong  East China Normal University, China</p> <p><b>Abstract:</b> With the development of technology, the preservation of digital evidence becomes increasingly important in case investigations. To maintain the authenticity of an evidence, its entire lifecycle has to be recorded. In addition, traditional database technologies are not able to maintain the integrity and authenticity of digital evidence. In order to achieve authentication and integrity, as well as confidentiality, of digital evidence, we propose a protocol for digital evidence chain of custody based on revocable ciphertext-policy attribute-based encryption, BLS signature, and blockchain technology. In our protocol, attribute-based encryption is used to achieve fine-grained access control and BLS signature is used to verify digital evidence. Besides, we use blockchain technology to ensure the integrity and traceability of digital evidence. Analysis and experimental results show that the proposed protocol, which well balances the privacy and the traceability, guarantees the integrity and validity of evidence.</p>
CR0021	<p>The Impact of Block Parameters on the Throughput and Security of Blockchains  <b>Authors:</b> Elham Akbari, Wenbing Zhao, Shunkun Yang and Xiong Luo  Cleveland State University, USA</p>

**Abstract:** It has been well recognized that traditional blockchains have limited throughput. It is intuitive to achieve higher throughput by increasing the block size and shorten the block interval. In this paper, we study the security implications on doing so, and define the boundary for acceptable block sizes and block intervals. We define the security of the blockchain in terms of the stale block rate in the network and carried out an empirical study using a blockchain simulator to find the optimal block parameters (size and interval). We show that it is possible to achieve sufficiently high throughput for a blockchain platform to be used for activities beyond cryptocurrency, such as state-level electronic voting.

**LISTENERS**

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## UPCOMING CONFERENCES



Welcome to the official website of **2020 The 9th International Conference on Economics and Finance Research (ICEFR 2020)**, which will be held during **June 17-19, 2020**, in **IDRAC Business School, Paris Campus, France**.

### Publication



*International Journal of Trade, Economics and Finance* (IJTEF, ISSN: 2010-023X, DOI: 10.18178/IJTEF), and will be included in Engineering & Technology Digital Library, ProQuest, Crossref, Electronic Journals Library, EBSCO, and Ulrich's Periodicals Directory. International Journal of Trade, Economics and Finance (IJTEF) is an international academic open access journal which gains a foothold in Singapore, Asia and opens to the world. It aims to promote the integration of Trade, Economics and Finance.

### Topics

Topics of interest for submission include, but are not limited to:

- Advertising Management
- Business Performance Management
- Business & Economics
- Business Ethics
- Cost Management
- Decision Sciences
- Development Planning and Policy
- Economic Development
- Marketing Theory and Applications
- Prices, Business Fluctuations, and Cycles
- Welfare Economics
- Total Quality Management

### Submission Methods

1. Email: [icefr@academic.net](mailto:icefr@academic.net)
2. Electronic Submission System: <http://confsys.iconf.org/submission/icefr2020>

### Important Dates

Submission Deadline	April 15, 2020
Acceptance Notification	May 10, 2020
Registration Deadline	May 30, 2020
Conference Dates	June 17-19, 2020

### Contact Us

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**2020 The 11th International Conference on E-business, Management and Economics (ICEME 2020) in Beijing University OF Technology, Beijing, China, July 15-17, 2020.** ICEME 2020 aims to bring together researchers, scientists, engineers, and scholar students to exchange and share their experiences, new ideas, and research results about all aspects of Digital Technology in Education, and discuss the practical challenges encountered and the solutions adopted. The conference will be held every year to make it an ideal platform for people to share views and experiences in E-business, Management and Economics.

## Publication



Accepted excellent papers by ICEME 2020 will be published in the International Conference Proceedings, which will be sent to be indexed by **EI Compindex** and **Scopus**.

## Topics

Topics of interest for submission include, but are not limited to:

Cloud computing

Components, services and solutions for e-business

Collaboration information systems and technology

ERP applications and business process innovation

Adoption and diffusion of green IT/IS

Green supply chain management

Service requirements analysis

Inter-organization cooperation and management

Customer-centered service management

Service requirements analysis

Open innovation and IT business value

Service economics and risk management

## Submission Methods

1. Email: [iceme@academic.net](mailto:iceme@academic.net)

2. Electronic Submission System: <http://confsys.iconf.org/submission/iceme2020>

## Important Dates

Submission Deadline	April 25, 2020
Acceptance Notification	May 15, 2020
Registration Deadline	June 05, 2020
Conference Dates	July 15-17, 2020

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**2020 The 9th International Conference on Business, Management and Governance (ICBMG 2020)** will be held in **The University of Western Australia, Perth, Australia** during **November 16-18, 2020**. The conference is sponsored by IEDRC and co-sponsored by The University of Western Australia Business School. It aims to provide a forum for researchers, scientists, engineers, and scholar students from both the industry and the academia to share their newest research findings and results.

## Publication



The accepted papers by ICBMG will be published in IJIMT. Submissions will be reviewed by the conference committees and journal editorial board, and accepted papers will be published in *International Journal of Innovation, Management and Technology* (IJIMT, ISSN: 2010-0248, DOI: 10.18178/IJIMT) as one volume, and will be included in **Google Scholar, Ulrich's Periodicals Directory, Crossref and ProQuest, Electronic Journals Library**.

## Topics

Topics of interest for submission include, but are not limited to:

- |  |  |
|--|--|
| Business & Economics                       | Virtual Communities and Communications Systems |
| Business Ethics Economic Systems           | Thinking                                       |
| Entrepreneurship                           | Taxes (related areas of taxes)                 |
| Finance & Investment                       | Technological Change; Research and Development |
| Financial Economics                        | Technology & Innovation                        |
| Global Business Technology and Education   | Time Management                                |
| Technology, Society, Environmental Studies | Total Quality Management                       |
| Urban and Regional Planning                | Travel/Transportation/Tourism                  |
| Urban Studies                              | Welfare Economics                              |
| Violence, Extremism, and Terrorism         | Public Economic                                |

## Submission Methods

1. Email: [icbmg@iedrc.org](mailto:icbmg@iedrc.org)
2. Electronic Submission System: <http://confsys.iconf.org/submission/icbmg2020>

## Important Dates

Submission Deadline	Sep. 20, 2020
Acceptance Notification	Oct. 10, 2020
Registration Deadline	Oct. 30, 2020
Conference Dates	Nov. 16-18, 2020

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