

Anti-Covid: Informatics against Covid-19

Internet Workshop

Committee of Informatics, the Polish Academy of Sciences

The Internet Workshop Anti-Covid took two days: from 22 to 23 June 2020. The goal was to initiate and integrate activities aiming at overcoming the problems concerning Covid-19 by using ICT tools and methods. The scope was fairly comprehensive and comprised the following topics:

Computing support for understanding Covid-19 and its implications (modelling and prediction of spread of the virus, modelling socio-economic implications, computer-supported diagnosis of Covid-19, bioinformatics aspects of Covid-19),

ICT in protection against Covid-19 (safety vs. privacy, tracing infectious contacts),

ICT in the times of pandemic (online education, virtual offices)

The workshop consisted of 9 invited lectures and 15 presentations selected by the Programme Committee. Every day the number of participants was over 100. More information about the workshop and its organization can be found on the following webpage (please note that most of the information is in Polish only):

<https://antycovid.ipipan.waw.pl/>

One can find there abstracts, slides and video recordings. There will be also a special issue of the *Bulletin of the PAS: Technical Sciences* (JCR Impact Factor 2019: 1.385) with a few selected papers covering the topics of the workshop. It is planned to organize another such workshop in 2021 under auspices of IFIP.

IFIP INTERNET OF THINGS 2020 VIRTUAL CONFERENCE

5-6 November 2020

<http://ifip-iotconference.org/>

The IFIP International Internet of Things (IoT) Conference is the annual event of IFIP totally dedicated to IoT research, innovations and applications, putting emphasis on the multidisciplinary nature of the IoT world.

The 3rd IFIP IoT Conference was planned to take place in Amsterdam, The Netherlands, on 5-6 November 2020. Due to the pandemic situation, it was decided to postpone the physical conference for 2021 and instead organizing this year a virtual conference with invited talks. This virtual conference will occur on the same dates planned for the Amsterdam conference (5-6 November 2020), and it will require registration to be attended, but it will be free of charge for the attendants. The link to connect to the virtual conference will be sent in due time to all those that have registered.

We have put together an ambitious series of eight talks, which reflect the state-of-the art of IoT in its different domains. The talks will be given by researchers who have been actively working in the field and who have kindly accepted to contribute to the conference.

The list of talks is the following:

A perspective on IoT and on its current frontiers	Prof. Augusto Casaca	INESC-ID/INOV, PT
IoT standardization	Dr. Georgios Karagiannis	AIOTI, BE
Machine Learning on Constrained Edge IoT	Prof. Srinivas Katkoori	University of South Florida, USA
Security and privacy in the IoT	Prof. Elisa Bertino	Purdue University, USA
Orchestration of IoT services	Prof. Jean-Yves Tigli	UNICE, FR
Advanced IoT Applications for Smart-Health	Prof. John Stankovic	University of Virginia, USA
Challenges in the industrial IoT deployments and AI for digitizing industry	Dr. Ovidiu Vermesan	SINTEF, NO
Tactile Internet for remote operations	Dr. Vijay Rao	Cognizant, NL

In the virtual conference, we are focusing on some of the most relevant technical aspects of the IoT world, which range from the IoT technologies to the demanding real-time applications, including the use of machine learning and AI techniques in IoT based systems. Also, the relevant field of IoT technical standardization will be covered as well as the security and privacy aspects.

The updated program, times and registration will be available in the conference web site <http://ifip-iotconference.org/>

We trust that this initiative is of interest not only for those researching in IoT based systems, but also to all those who wish to have a perspective of where we stand in IoT.

For more information or questions, please contact: Leon Strous (strou@iae.nl), Srinivas Katkoori (katkoori@mail.usf.edu) or Augusto Casaca (augusto.casaca@inov.pt)

IFIP Code of Ethics and Professional Conduct

At the virtual IFIP General Assembly held 24th September 2020 GA enthusiastically adopted a new IFIP Code of Ethics and Professional Conduct. The Code had been adapted from the ACM Code of Ethics published previously, which itself had been through many years of consultation and development with members of IFIP, IEEE, other national and international bodies and companies. That process was led by IFIP WG9.2.2 Chair Don Gotterbarn, who joined TC9 Chair David Kreps, IP3 Chair Moira de Roche, and MSA Representative Margaret Havey in the Code of Ethics Task & Finish Group set up at GA 2019 in Kiev.

Led by David Kreps, the Task and Finish Group undertook further consultations with Member Societies and with the IFIP Board, to produce the final version adopted at GA2020. The IFIP Code of Ethics is not intended to replace Codes specific to Member Societies, which may contain unique points relevant to their cultures. The Code contains elements, however, that might not be included in the Member Society Code. Therefore, the IFIP Code of Ethics can be adopted alongside a Member Society's Code, or Member Societies can modify their Code to include those values and guidance not already included in their own Codes or simply reference it in addition to their own codes.

In the words of Jussi Nissilä, CEO of the Finnish Information Processing Society (TIVIA) "The code has been gone through, line-by-line, by the TIVIA Working Group on Ethics, and no reason to not adopt it was found - on the contrary, the Working Group on Ethics considered it to be culture independent, and suitable for TIVIA, as well as any computing society". Maxine Leslie, Secretariat and Committee Manager at the British Computer Society, likewise, reported that "The BCS Academy of Computing has reviewed the proposed IFIP Code of Ethics and will be pleased to endorse it, finding it a very robust document covering a variety of important and interesting topics." Vicki Hanson, CEO of the ACM, said "As an international member of IFIP, ACM endorses the proposed IFIP Code of Ethics as a common international standard for computing and the profession."

The Code and its associated prologue, and some Case Studies to help in the application of the Code, will appear on a website at www.ifiptc9.org in the coming months. A printed booklet is planned for a launch event in 2021.

David Kreps 24/9/20

Wroclav virtual conference

WG8.3 Decision Support bi-annual conference was highly successful in the midst of a global pandemic. The virtual event of the 20th Open Conference of IFIP WG8.3 Decision Support was organized by the Faculty of Management, General Tadeusz Kościuszko Military University of Land Forces, Wrocław, Poland, and the Faculty of Computer Science and Management, Wrocław University of Science and Technology, Poland.

The theme of the conference was "Toward enhanced risk management, shaping risk culture theory and making sound decisions under pressure" and was held virtually on 24-26 June 2020 from Wrocław, Poland. The conference drew papers from ten countries and three continents and consisted of two keynotes, a tutorial, a panel, and 39 paper presentations. The technology support was excellent, and the conference attendees were delighted to see and talk with each other at least virtually. Many wonderful collaborations and friendships have ensured over the years.

The next conference was announced for June 2022 in Budapest, Hungary, organized by Corvinus University with Professor Zita Paprika as host. Corvinus University is considered the home of IFIP WG8.3, and we look forward to returning.

Announcement about the launch of the AIS Special Interest Group on the Changing Nature of Work (SIGCNoW)

During the last decade, research on the changing nature of work has emerged within the IS community and interest in this topic has steadily grown over the years.

The IFIP working group 9.1 (ICT and work) pioneered the movement and hosted a number of events such as the yearly pre-ICIS workshop titled 'International Workshop on Changing Nature of Work with ICT (CNoW)' has been held since 2013 in Milan. Additional efforts, events and sub-communities researching the future of work emerged among AIS members.

In order to combine and merge these efforts the AIS Special Interest Group on the Changing Nature of Work (SIG CNoW) has been launched. Since July 2020 the SIGCNoW formally institutionalizes existing and emerging efforts concerning research and teaching of these issues within the AIS community.

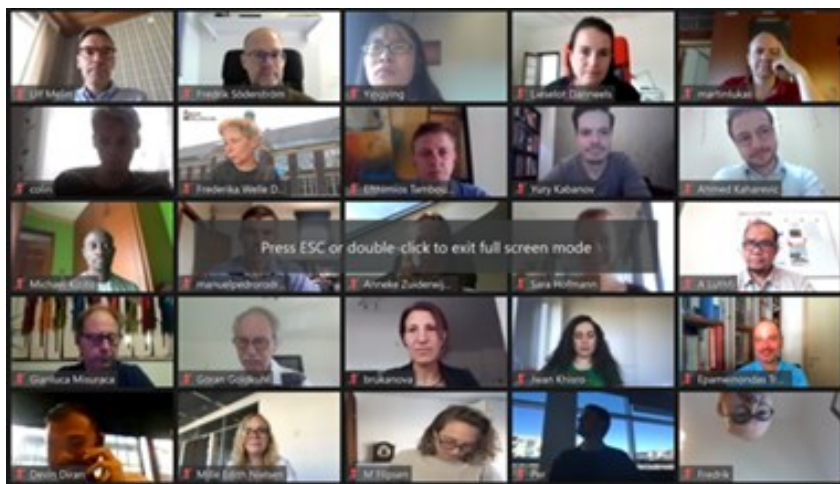
Due to COVID-19 there is a lot of uncertainty, but at this point, we are planning to hold an inauguration meeting scheduled at ICIS 2021 in Austin Texas. It would be great to see you there.

Virtual IFIP EGOV2020 Conference

During August 31 – September 2, the IFIP WG 8.5 on ICT & public administration in cooperation with the Digital Government Society (DGS) organised the annual IFIP EGOV-CeDEM-ePart2020 conference. This conference represents the merge of the IFIP WG 8.5 Electronic Government (EGOV), the IFIP WG 8.5 IFIP Electronic Participation (ePart) and the Conference for E-Democracy and Open Government Conference (CeDEM). The conference focused on e-Government, Open Government, eParticipation and e-Democracy as well as on several other related topics, such as the role of social media, digital transformation in society, Artificial Intelligence, legal informatics, policy information, smart governance and social innovation.

The conference attracted different types of submissions, including completed research, ongoing research, practitioner papers, reflections & viewpoints, posters and workshops. In addition, the conference organized a PhD colloquium. The conference featured keynote speeches about digital transformation in public administration and making an societal impact, and workshops about open data, smart cities and artificial intelligence in public administration.

Originally planned to take place at Linköping University in Sweden, IFIP EGOV2020 was held as a fully digital conference. The authors recorded a short presentation of their paper beforehand so that the conference focused on providing feedback, discussing research and learning from each other. The virtual version of the conference worked very well and stirred a lot of discussion and engagement among scholars. With about 70 participants, the first fully virtual IFIP EGOV conference was a great success. The recorded presentations can be viewed at: <http://videolectures.net/EGOV2020/>



5th China River Crab Industry and Dongying Marine Economic Development Summit Forum

The 5th China River Crab Industry and Dongying Marine Economic Development Summit Forum was successfully held in Dongying on September 22, 2020.



This BBS was jointly organized by Chinese Fisheries Society, Agriculture and Rural Areas in Shandong Province Hall, Kenli District People's Government, office of science and technology, Marine Development and Fisheries Service in Dongying city, Shanghai Ocean University, Shandong Freshwater Fisheries Research Institute, Kenley district people's government jointly organized, and undertaken by Kenli District Science and Technology Bureau, Kenley District Marine Development and Fisheries Bureau and several other institutes.

Member of Chinese Academy of Sciences Jian-fang GUI, Shanghai ocean university vice-chancellor Ricky lee, the national aquaculture technology promotion station/commissioner of Chinese fisheries society academic exchanges Wen-wu Zhao, China agricultural university, national digital fishery Dao-liang Li, director of the center for innovation, the national system of crayfish crabs posts expert/Shanghai ocean university professor Yong-xu Cheng, national system of crayfish crabs post experts/Jiangsu freshwater fisheries research institute researcher/week, the national system of crayfish crabs posts experts in Hefei University of Technology professor Lu Jianfeng, national crayfish chief expert/Zhongshan Jian-guo He, a professor at the university of crayfish industry technology system post scientists/Chun-lin Wang, a professor at the University of Ningbo, China branch Li Zhongjie, a researcher from the Institute of Hydrobiology of the College, Li Xian, an associate researcher from the Institute of Oceanology of the Chinese Academy of Sciences, Wu Xugan, a professor from Shanghai Ocean University and other relevant personnel, as well as media journalists, domestic industry personages and business representatives attended the event.



Professor Li Daoliang, director of the National Digital Fishery Innovation Center at China Agricultural University, describes the origin of no fishing ground -- the employment of agricultural population is declining around the world, especially in China, while the aging of the labor force is becoming more prominent and the cost is rising. In his report, he also said in the future, in the absence of any person to enter the fishery, facilities, equipment, machinery and robots will complete the entire operation process from patrol inspection, oxygenation, bait casting, daily management to harvest. He also detailed strategies for future development of unmanned fisheries.

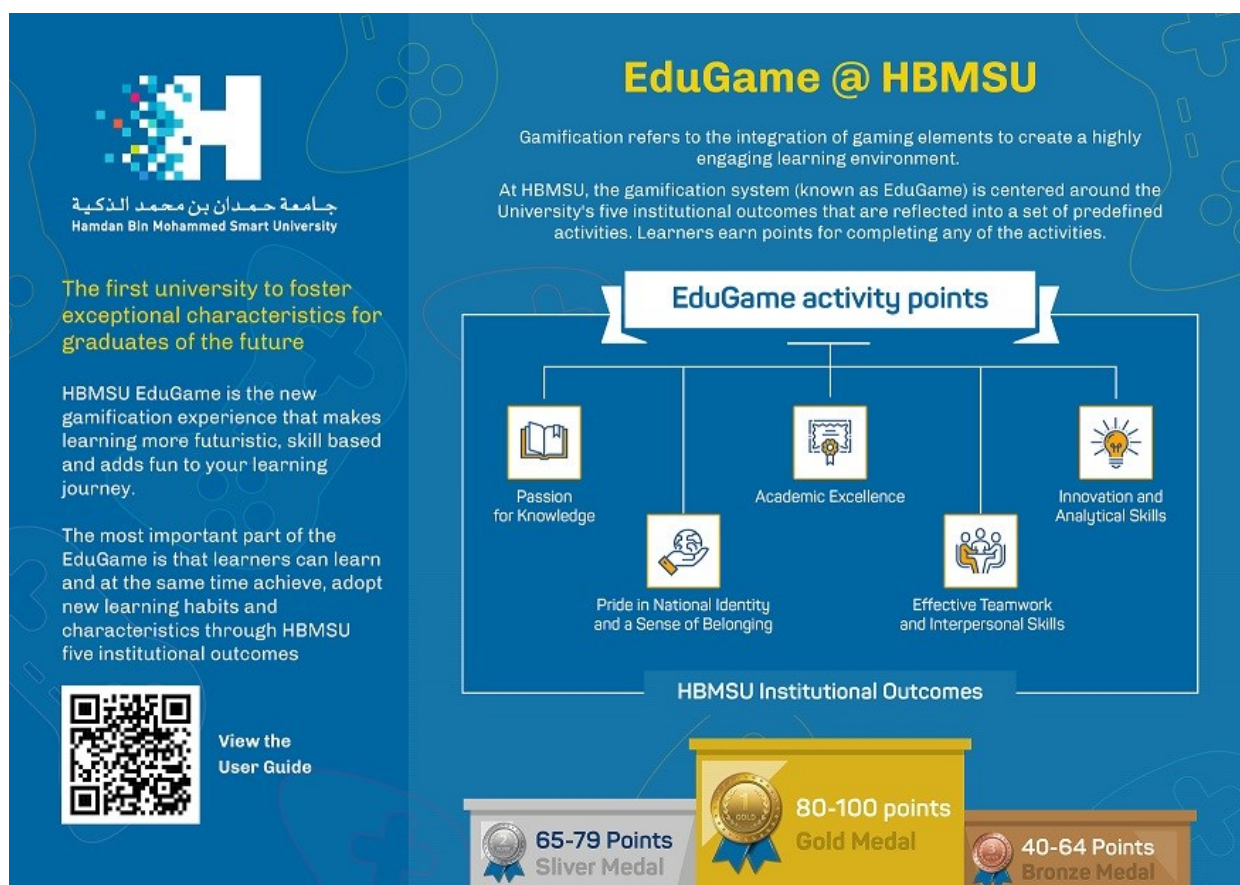
Launch of HBMSU's new gamification system

Hamdan Bin Mohammed Smart University (HBMSU) launched its new gamification system 'EduGame' in September 2020. HBMSU EduGame is the new gamification experience that makes learning more futuristic, skill based and adds fun to learning journey. The most important part of the EduGame is that learners can learn and at the same time achieve, adopt new learning habits and characteristics through HBMSU's five Institutional outcomes:

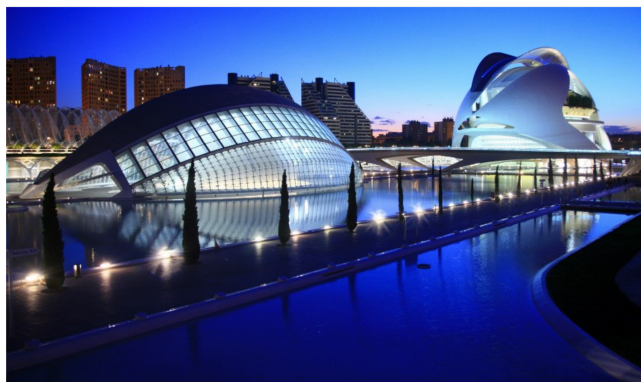
1. Academic Excellence
2. Innovation and Analytical Skills
3. Passion for Knowledge
4. Effective Teamwork and Interpersonal Skills
5. Pride in National Identity and a Sense of Belonging

H.E. Dr. Mansoor Al Awar, Chancellor of HBMSU, shared during the launch: "The new version of EduGame, which engages learners and motivates them to take part in community activities, interactive discussions, and volunteering, reflects HBMSU's learning outcomes. Using top-notch technologies, the system is designed to provide a unique learning experience in line with the government's directive to invest more in the country's human capital as the most important resource for development." He pointed out that the innovative system is now part of HBMSU's pioneering vision to integrate games into learning in a bid to redefine higher education and make radical changes in the learning process to make it an enjoyable and interesting journey. This will also help in elevating the capabilities and talents of the young and developing their skills to transform them into an influential force that will drive and shape the UAE's future.

The use of EduGame makes the best out of the learning experience and level up the learners' participation as more engaging and interactive. EduGame is linked to HBMSU institutional outcomes, and each outcome consists of a list of activities whether producing research, solution, prototype, extended abstract, poster, published case studies or paper or any education or scientific matter.



The IFIP W10.4 Flagship Conference DSN 2020 Celebrates its Golden Jubilee... Virtually!!



The IEEE/IFIP International Conference on Dependable Systems and Networks (DSN) is the flagship conference for research fostering robustness and resilience of a whole spectrum of today's computing systems, where dependability and security concerns can no longer be tackled in isolation. The topics covered spanned traditional computer systems and networks, clouds, internet-of-things, cyber-physical systems, and other application areas.

DSN celebrated its 50th Anniversary this year, a long journey of key contributions from the first conference in 1970, to the development of modern dependable and secure systems. The vitality of the conference is confirmed by the largest number of submissions to the research track in the last 13 years, and the 4th largest attendance in the conference's history.

DSN 2020 was initially planned to be held in Valencia, the first time that the event was to be held in Spain. Unfortunately, COVID-19 changed everything, and the event was run virtually for the first time in its history. This has been a completely new experience for both the organizers and attendees.

The conference featured a rich program including 49 research papers selected from over 280 submissions, more than 30 presentations in 4 workshops, addressing safety and security challenges in intelligent vehicles, machine-learning dependability, data-centric dependability, and high-performance computing platforms for autonomous systems; 3 tutorials covering diverse topics such as soft errors, cryptocurrency, and anomaly detection; 10 industry papers, 7 Doctoral forum papers, and 12 fast abstracts.

The conference offered three outstanding invited speakers: Jeannette M. Wing, Avenessians Director of the Data Science Institute and Professor of Computer Science Columbia University talked about "Trustworthy AI"; Dahlia Malkhi, Research Lead at Calibra, presented "The Journey to Libra Blockchain Core and Beyond"; and José Duato, Professor of Computer Engineering at Universitat Politècnica de València and Member of the Spanish Royal Academy of Sciences, talked about "Guaranteeing acceptable levels of performability in modern interconnection networks despite congestion". In addition to the traditional Best Paper and Test-of-Time Awards, and the well-known William C. Carter and Jean-Claude Laprie Awards, this year, the Rising Star in Dependability Award was given for the first time. The attendees expressed high satisfaction with the conference organization and contents.

The video teasers and complete presentations of all the contributions can be found in the conference webpage - check them out to learn about the latest advances on dependability and security that were addressed at DSN 2020: <https://dsn2020.webs.upv.es/>



Celebrating excellence in adversity: 2020 IITPSA President's Awards to go ahead!

Nominations now open for SA's top IT Personality, Visionary CIO and other awards

The Institute of Information Technology Professionals South Africa (IITPSA) has announced that the prestigious annual IITPSA President's Awards will go ahead this year, despite restrictions on gatherings and face to face engagements.

The IITPSA Board has resolved to go ahead with the awards, which include the IT Personality and Visionary CIO of the Year accolades, using online nominations and virtual meetings to support judging.

IITPSA CEO Tony Parry says: "The Covid-19 pandemic and lockdown have illustrated how crucial ICT is to the functioning of all organisations, but enabling business as usual in this challenging time has put heavy pressure on ICT professionals. This year's awards are therefore to be held with the theme 'Excellence in Adversity', and will celebrate those who enabled their organisations to survive and grow despite particularly challenging circumstances."

The IITPSA President's awards, presented in partnership with leading ICT media publications and other awards partners, have recognised the South African IT industry's leading lights for over 40 years. Past winners include the likes of Geekulcha COO Tiyani Nghonyama as the IT Personality of the Year and Alexander Forbes Group CIO Sandra La Bella as the Visionary CIO (2019), Etion CEO Teddy Daka and Absa CIO for Virtual Channels Jacques Barkhuizen (2018), Entelect CEO Shashi Hansjee and former Sasol Global CIO Alec Joannou (2017) and Adapt IT CEO Sbu Shabalala and Peter Alkema, business banking CIO at First National Bank (2016).

IITPSA has called for nominations for the following awards:

The IT Personality Award, which recognises a highly respected and outstanding ICT professional who has made a significant technical or academic contribution to the industry, who has been successful in building a highly-respected IT organisation or business, and/or who has made a major contribution to the IT profession over a number of years.

The Visionary CIO Award, which honours a CIO who has demonstrated visionary leadership in using IT to support, grow and transform business and/or who has established best practice in implementing technology solutions in an organisation.

The Technology Excellence Award, which will be presented to a person or team who has made exceptional or innovative use of technology for an organisation and/or who has exhibited technological excellence that has delivered measurable benefit for business/the SA Economy.

The Social Responsibility/Community Award, which will be presented to a person, team or project that delivers the benefits of IT on a not-for-profit basis into the community or brings the community into the IT space.

Click [here](#) to nominate candidates. Nominations close on Friday 20 October, after which a judging panel will select this year's winners.

IITPSA aims to hold the awards ceremony in the first quarter of 2021, circumstances permitting. For further information visit: <https://www.iitpsa.org.za/annual-presidents-awards-2020/>

IWOCA 2020 in Bordeaux (Oops! On-Line!)

Florent Foucaud (florent.foucaud@gmail.com)

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By mid-March it was becoming clear, as the global pandemic worsened, that plans could not reliably be made to hold *31st International Workshop on Combinatorial Algorithms, June 8–10, 2020, Université de Bordeaux, France, IWOCA 2020*, both in June and on site at l'Université de Bordeaux (see <https://iwoca2020.labri.fr>).

The organizers (the first four authors of this report), in concert with the *IWOCA* Steering Committee (see <https://nms.kcl.ac.uk/iwoca/steering.html>), were faced with challenging options and little time to resolve the question *Postpone to later in the year? Cancel, and hope for better conditions in 2021? Plunge into terra incognita and go on-line?*

By May Day, the collective decision had been made: not only would *IWOCA 2020* be “virtual”, but the original dates, 8–10 June, would be retained. The quick mobilization of the local organizing committee enabled us to hold a successful meeting: we thus warmly thank all its members (see <https://iwoca2020.labri.fr/committees>). We also wish to thank the members of the program and steering committees, speakers, session chairs, participants and our generous sponsors.

This article briefly describes our experience, which we hope may be of benefit to other on-line conference organizers in future, and also outlines the thematic scope of this meeting.

The biggest surprise was that the registered participants in our virtual *IWOCA* surpassed 480 - at least six times the largest number ever recorded for any one of the 30 previous *IWOCA*s! The registration was free of charge, and we tried to distribute the call for participation as broadly as possible not only through classic distribution lists, but also through our personal contacts, which in several cases was very successful. The *average* attendance at the on-line talks was 75–80, ranging as high as 110, both figures again much higher than any recorded in the past. The participants in *IWOCA 2020* hold appointments at institutions in at least 45 different countries on six continents (Africa, Asia, Europe, North America, Oceania, and South America). The represented countries were:

India (64), USA (45), Greece (44), Canada (40), France (37), UK (31), Japan (30), Germany (26), Iran (13), Italy (13), Israel (11), Austria (10), Brazil (10), Netherlands (6), Poland (6), Slovenia (6), South Korea (5), Russia (5), Spain (5), Sweden (5), Switzerland (5), Bangladesh (4), China (3), Serbia (3), Belgium (2), Chile (2), Hong-Kong (2), Indonesia (2), Mexico (2), Norway (2), Armenia (1), Argentina (1), Czech Republic (1), Denmark (1), Faeroe Islands (1), Hungary (1), Malaysia (1), Montenegro (1), New Zealand (1), Romania (1), Singapore (1), Taiwan (1), Tunisia (1), Turkey (1), United Arab Emirates (1). By continent, almost half (47%) came from Europe, with 30% from Asia, 22% from the Americas; there was one participant each from Africa and Oceania.

To accommodate as many time zones as possible, it was decided to have sessions from 9am to 6pm (Bordeaux time). The talks, including questions, were given live using the Zoom on-line conferencing system, and, with a little practice beforehand by speakers and session chairs, ran smoothly. The idea was to enable people to gather in real-time, which is why the talks were not pre-recorded.

Zoom was also made available for: informal chats in the *breakout rooms*; the Open Problems session, chaired by Alessio Conte (Università di Pisa) and Gabriele Fici (Università di Palermo); the Business Meeting, where presentations were made for *IWOCA 2021* (Lucia Moura, University of Ottawa) and *IWOCA 2022* (Henning Fernau, Universität Trier); Graphmasters, a satellite meeting held one day after *IWOCA 2020* (see <https://iwoca2020.labri.fr/graphmasters>).

In addition, impromptu meetings with the speakers or specific participants could be performed via a dedi-

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cated Discord server. The Discord server was also used during the small-group discussions of Graphmasters. In order to animate the breaks in between the talks, the moderators (organizers, session chairs) filled in the blanks by talking (e.g., with the next speaker), making announcements, etc. The idea was to make it a little bit like on a TV or radio live-show. The number of questions asked after the talks were sometimes very low. It thus seems important to find a way to encourage questions and feedback, and perhaps the moderators should prepare more for this task. We also had two photo-sessions, where we asked voluntary participants to switch on their camera, and made some screenshots. This was well-received and helped to relax the atmosphere. In retrospect, perhaps this could have been done already at the opening of the conference, as it created a more personal experience. Indeed, the main challenge in a virtual conference is to emulate the social interactions that naturally occur in a physical conference.

Springer-Verlag this year made the Proceedings available on-line on the conference website, and in addition provided 50 hardcopies to those who requested them. Altogether the Proceedings (LNCS 12126), published in the ARCoSS subline of LNCS, include the 30 accepted papers (out of 62 submissions) and one of the three invited papers. Awards, sponsored by Springer, were made for the best paper by Peter Damaschke (*Two robots patrolling on a line: integer version and approximability*), and the best student papers, won jointly by Pratibha Choudhary (*Polynomial time algorithms for tracking path problems*) and Florent Foucaud, Benjamin Gras, Anthony Perez, Florian Sikora (*On the complexity of broadcast domination and multipacking in digraphs*).

The three invited talks were given by Dan Alistarh (*Optimization by population: large-scale distributed optimization via population protocols*), Sándor Fekete (*Swarms of objects at extreme dimensions*) and Tatiana Starikovskaya (*Algorithms for string processing in restricted-access models of computation*).

Graph algorithms dominated the contributed talks this year, but there were also several papers dealing with *Dynamic and online algorithms*, and *Parameterized algorithms*, reflecting the increased interest in these topics. Of the 30 accepted papers, 9 dealt with *Graph algorithms*, 5 with *Dynamic and online algorithms*, and 5 with *Parameterized algorithms*. The 11 remaining papers covered diverse topics from *Combinatorial algorithms*, *Graph theory*, *Graph matching*, *Matroids*, and *Distributed algorithms*.

As usual, authors of selected Proceedings papers were invited to submit significantly enhanced versions of their work to a special issue of an important journal - this year, *Algorithmica*.

IWOCA descends from the original *Australasian Workshop on Combinatorial Algorithms*, first held in 1989, and then renamed *International* in 2007 in response to consistent interest and support from researchers outside the Australasian region. The workshop's permanent website can be accessed at

<http://www.iwoca.org> where links to all IWOCAs - past, present and future - can be found, as well as a list of Open Problems in the domain.

Pandemic highlights SA's digital divide'

The lockdown proved to be an eye-opener in terms of how far South Africa must still go to overcome the digital divide, and bring millions of citizens into the digital economy.



This is according to speakers at a webinar endorsed by the Institute of Information Technology Professionals South Africa (IITPSA) and hosted by Nedbank, EE Business Intelligence and the Joburg Centre for Software Engineering (JCSE) at Wits University.

The webinar, on narrowing the digital divide to provide available and affordable Internet access for all South Africans, heard that while both the public and private sector were endeavouring to close the divide; millions of people were still unable to access the digital economy, e-government services and digital education.

The Minister of Communications and Digital Technology, Hon. Stella Tembisa Ndabeni-Abrahams, said the Covid-19 lockdown had exposed serious gaps in national coverage, particularly in last mile access to rural areas and small towns.

"Covid-19 exposed us to some harsh realities," she said. "As people migrated to rural areas during the lockdown, it exposed gaps. People may not have been able to access government services, and students could not access learning. Covid-19 has exposed us to the reality that we have not done much; we need to work together to connect the unconnected. We have to take broadband to where the people are."

The Minister said her department was taking this into consideration as it conducted a feasibility study into SA Connect Phase 2, which is due to be completed this year.

Describing broadband as a crucial human right, the minister urged partnerships to deliver affordable, high speed access to everyone. "We call on all stakeholders to work collaboratively for the common good. None of us acting in isolation will win the battle," she said.

Mark Harris, CEO of Altron Nexus, noted that existing penetration was lower than generally stated, since only 12% of households had access to DSL and fibre connections. "Lower income people may have 3G or 4G access, but most can't afford to use it; and in addition they may not have the right access devices. The total broadband numbers don't look good, and the biggest issue is going to be around affordability."

"Fortunately, we do have leaders in this country who keep looking at universal access. Government is trying to react as fast as they can, the technology is improving and costs are coming down. But it will take time. There is no magic bullet; the investments have to continue, and the government has to keep this focus, because we have to allow all parts of society to participate in the digital economy," he said.

Exposing multiple divides

Arthur Goldstuck, MD of World Wide WorX, noted that multiple digital divides had been exposed during the lockdown: Google trends analysis showed there had been a spike in entertainment, education and video conferencing during the lockdown. "The haves were able to search for and benefit from these advantages," he said.

Employees who had high speed connectivity had been able to continue working from home. "Without connectivity, workers and job seekers are at the mercy of chance and circumstance – a destiny divide."

Connectivity also enabled cloud computing, which enhances business efficiency, agility, customer service, time to market and cost savings, among others. Entrepreneurs and businesses who do not have the skills and resources to access cloud computing find themselves on the wrong side of a competitiveness divide, Goldstuck said.

He said in a digital awakening, when organisations embrace the digital way of work, it suddenly became possible to do everything online – from live collaboration on a document to sharing live events instantly.

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"The digital awakening is a necessity for all to embrace the new future, and it's connectivity that will allow the digital awakening," he said.

Highlighting the needs of learners

Dr. Lucienne Abrahams, director, Wits University's LINK Centre, highlighted challenges in delivering digital education and preparing youths to become the 21st century workforce without adequate connectivity. "Many schools have internet access that is really 'pretend internet'," she said. "They don't have good enough connectivity to participate in an online course using dynamic software.

We have to build education streaming services, we need to be able to do live streaming and asynchronous content streaming for everything from geography and maths to music and choirs - not simply for a few pages of content online. We need to think about the transition of the nature of school. In the future, everyone in the transition from school to work will need digital skills, including basic software design skills – that is what connectivity means."

Overcoming constraints

Lance Williams, executive responsible for Infrastructure at the State IT Agency (SITA), said constraints in the way of progress to universal access including the economic impact of the pandemic, a fragmented approach to conceptualising, acquiring and implementing broadband solutions, and a focus on infrastructure and technology without adequately addressing change management, capacitation, skills development and optimising underlying business processes.

Williams said limited progress had been made in addressing broadband needs in rural and deep rural areas. "We have reasonable connectivity to government sites, but we need to start focusing on addressing the last mile to villages and citizens; to close the last mile gap and ensure they have access to affordable high speed broadband infrastructure and services, as well as the necessary skills to be able to effectively utilise this infrastructure. We need to have a clear and unifying strategy, plan and vision," he said.

"With constrained resources, it's more likely we will shift to shared risk models, with the government aggregating its demand to create incentives for service providers to get enabling infrastructure into deep rural areas."

Proactive compliance means POPIA won't be a burden

IITPSA KZN Chapter webinar calls for moves to align with data protection, privacy legislation



With just a year's grace to achieve compliance, organisations need to take proactive measures now to align with the guidelines of the Protection of Personal Information Act (POPIA). However, they should note that the Act should not be seen as a burden, and rather as an important set of guidelines to safeguard both businesses and their customers.

This is according to Sarisha Kisten, a practising attorney in KwaZulu Natal and the Managing Director of legal advisory Enyuka Consulting, who was addressing a webinar hosted by the KwaZulu Natal chapter of the Institute of Information Technology Professionals South Africa (IITPSA) earlier this week.

Outlining key pieces of data protection and privacy legislation – Europe's General Data Protection Regulation (GDPR) and South Africa's POPIA – Kisten said: "Compliance with data protection and privacy legislation goes beyond regulatory compliance, it's about protecting your organisation's reputation and people's right to privacy. Personal data is a commodity which is often sold to data brokers. Whether people are using navigation services, adding their details to a Covid-19 registry or using biometric access systems, they are sharing personal information, and it needs to be protected," she said.

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Kisten said that data breaches could have devastating consequences. For an individual whose data was stolen, it could result in them having to change passwords frequently, enact credit freezes, conduct identity monitoring – and possibly being defrauded. For a business, it could negatively impact a business's reputation through loss of brand value, loss of trust and potentially financial losses.

"The motive behind GDPR is to standardise privacy laws across Europe and protect citizens' right to privacy – it is reshaping the way data is handled across every sector," she said.

She explained that the GDPR applied to any company that stored or processed personal information about EU citizens - If your business offers goods and/or services to citizens in the EU, then you will have to consider GDPR compliance. Furthermore businesses will need to comply with GDPR even if they do not have a business presence in the EU but do business with EU citizens "South African businesses are urged to examine GDPR in relation their business operations to determine the applicability of the regulations," she said.. Non-compliance with the GDPR could result in penalties which could be a costly mistake for businesses.

POPIA, which aligns with best practice legislation such as GDPR, commenced on 1 July this year and allows for a 12-month grace period until 30 June 2021 for organisations to comply. Kisten explained that POPIA aims to protect personal information processed by public and private bodies, set conditions or guidelines on how personal information should be processed, issue codes of conduct to regulate certain industries and how they manage personal information and provide for the rights of persons regarding direct marketing. The Information Regulator is tasked with monitoring and enforcement.

Kisten said that while POPIA made provision for fines of up to R10 million and up to 10 years' jail time, enforcement would likely start with a notice of non-compliance issued by the Information Regulator, and that time would likely be allowed for any non-compliance to be rectified.

Kisten said it was important for organisations to understand what was meant by personal information and processing: "Almost all South African businesses keep information about staff and customers, and very few will be exempt from POPIA," she said. POPIA will apply to any personal information that can be traced back to an individual – including photos, she said.

"Non-compliance could be raised by a breach, in an audit by the Information Regulator, or in a civil case. Organisations need become aware of the penalties, as well as the risks of reputational damage and losing customers and employees," she said.

Kisten recommended that organisations should move now to become compliant with POPIA and other best practice data protection and privacy laws. She said the roadmap to compliance should start with the appointment of an information officer and/or a POPIA Committee, and then go on to analyse all data processing activities within the organisation. "Businesses must consider all facets of data processing in all divisions and all departments," she said.

Organisations also had to train relevant staff on POPIA, she said. "Awareness is important, because it brings about a culture shift," Kisten said.

There was also a great need for businesses to ensure that POPIA principles were integrated into contracts, procedures and terms and conditions. "POPIA measures need to be implemented throughout the business, and policies and procedures must be continuously reviewed and updated to remain compliant," she said.

The IITPSA KZN chapter webinar on data protection and privacy was one of a series of webinars being offered to IITPSA members to share knowledge, network and keep members up to date with new developments. For more information on the IITPSA and its upcoming events, please visit www.iitpsa.org.za

Winners announced in SA Computer Applications Olympiad

The Institute of Information Technology Professionals South Africa (IITPSA) has announced the winners of the Computer Applications Olympiad.



The annual Applications Olympiad is a challenge for learners who take CAT or the ICDL or are otherwise computer literate. The participants have to solve a number of problems using a common office package and the data provided. Contestants may use the application of their choice, such as the Word Processor, Spreadsheet, Database and Presentation Tool. The event is one of three [Computer Olympiad](#) challenges held each year to identify, encourage and reward computer aptitude, encourage computer studies, and create an awareness of career opportunities in ICT. The SA Computer Programming Olympiad is one of the oldest and largest competitions of its kind in the world and has been held since 1984.

While the event is usually held at schools and the finals at a central location, the lockdown prompted organisers to stage the Olympiad's second, third and final rounds, remotely this year. Computer Olympiad manager Michael Cameron said 6461 learners from 163 schools took part in the first round of the event before lockdown was instituted. Three weeks later, Covid-19 locked down schools. As the emergency deepened, the Computer Olympiad Board decided to hold the finals remotely, with ten teachers invigilating at the five provincial venues.

Noting that the Olympiad contributes to futureproofing South Africa by building the data skills of today's teens to help South Africa develop beyond the pandemic, Cameron said: "Reaching the finals is a significant achievement. Today, entrepreneurs are looking for young programmers. They see the benefit of having tech-savvy teens in business, and it is best to start young."

The winners of the 11th Applications Olympiad, announced this week, are:

Gold medal and IITPSA trophy winner – **Justine Barwise**, Grade 12, Hoërskool Waterkloof (Gauteng). Justine, who wins R10,000 for herself and R4,000 for her school, has earned the school's best academic achiever awards for CAT and economics in the years 2017 – 2019. She plans to study for a BCom degree next year. She described the Olympiad as a challenge, saying "I can truly say that I learned lots of things."

Silver – Latasha Claire Friend, Grade 12, Penryn College (Mpumalanga), who plans to study a BSc degree next year, will use her prize money to contribute to expenses.

Silver – Ruan Schoeman, Grade 8, Homeschool Midrand (Gauteng), who enjoys programming and opted to do both the Programming and Applications Olympiads, will use his money for a better GPU for his computer.

Bronze – Anais Herman, Grade 11, Hoër Meisieskool Bloemhof (Western Cape)

Bronze – Jaedon Naidu, Grade 11, Eden College (KwaZulu-Natal)

Bronze – Faran Steenkamp, Grade 12, Thomas More College (KwaZulu-Natal)



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Participation and provincial award winners:

Maryam Badsha, Grade 12, Rustenburg Girls' High (Western Cape) – placed 2nd in Western Cape (tie)

Kate Blake, Grade 12, Bergvliet High School (Western Cape) – placed 2nd in Western Cape (tie)

Urooj Mollah, Grade 12, Collegiate Girls' High (Eastern Cape) – placed 1st in Eastern Cape

Alok More, Grade 11, Glenwood High (KwaZulu Natal) – placed 2nd in KwaZulu Natal

Eric Peach, Grade 12, Hoërskool Randburg (Gauteng) – placed 2nd in Gauteng

R47,000 in cash prizes was awarded to the six medal winners and their schools, and all finalists receive free IITPSA student membership.

Moir de Roche, Non-Executive Director of the IITPSA and Chair of the Computer Olympiad Board, said during a virtual awards announcement: “We congratulate all the winners, who participated under unusual circumstances this year. I was delighted that so many of the finalists – more than half of them, and the winner, are young women.”

“In these interesting times, I want to thank learners, teachers, the Scientific Committee and the Computer Olympiad staff for doing what is necessary to make this competition work online. She advised the finalists: “If you keep nothing else from this difficult year, hang on to your persistence.”

“The IITPSA encourages talented young people like yourselves to keep up to date with the ever changing world of IT, and we encourage you to take part in at least one IITPSA event in the year ahead – it could help you shape your career and clarify subject choices. It will also help you develop a network of people, which will help you in your future career.”

IITPSA calls for universal access to support youth development

Institute in strong position despite ‘interesting’ times

The Institute of Information Technology Professionals South Africa (IITPSA) has urged a concerted effort to take digital access to every South African, to support youth development and small business growth.



Speaking at the IITPSA’s first online AGM this week, **IITPSA President Thabo Mashegoane** highlighted the Institute’s focus on the development of young ICT professionals and the need to develop a stronger ICT skills pipeline for the country, as well as to extend digital access to all sectors of society.

“The Covid-19 pandemic has proved beyond a shadow of a doubt that ICT is in fact critical infrastructure – as important as roads, sanitation and healthcare. But the past few months have also highlighted the fact that there are people who risk being left behind as we move toward the digital new normal,” he said. “ICT access is becoming a human right, and without it, millions of people cannot access education, jobs, vital information and services. As ICT professionals, we cannot simply be torch bearers for ICT – we need to assume greater responsibility for helping build this critical infrastructure. We need to ensure equitable access for everyone.”

Mashegoane called for the ICT industry to advocate for policy that is more favourable for the majority. “Now more than ever before, ICT needs to be talking to the government and forming partnerships across policy formulation and implementation. We need to be working together to create digital education platforms that

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are free or low cost, coordinated and transparent. The foundation for skilled or employable youth is access to training and education, so we have to create policies that give all young people equal access,” he said.

“Digital access is just as important for helping create jobs and build businesses as it transcends barriers such as location. Once they have digital access, our youth and small businesses can access business tools, information, services and opportunities. We need to focus our attention on becoming more involved in society and giving ‘Generation Next’ the skills and tools they need to thrive in a digital world,” Mashegoane said.

IITPSA members heard during the AGM that the Institute remains in a strong position, with growing membership, despite a year characterised by slow economic growth and the Covid-19 pandemic. The IITPSA reported back on a successful year of operations with an increased focus on thought leadership, career development and stakeholder engagement.

IITPSA CEO Tony Parry noted that the Institute membership comprised around 75% young professionals aged 26 – 40, with 70% of South African members being black, coloured or Asian, making it growingly representative of the local ICT sector and the broader South African demographic.

IITPSA members voted online to elect and/or re-elect the following non-executive Directors: Ulandi Exner, Admire Gwanzura, Rimmon Kisten, Karel Matthee, Kudzayi Chipidza, Senele Goba, Llewellyn Kearns and John Singh.

The IITPSA's office bearers for the 2020/21 year, elected at a board meeting today, remain unchanged, with Thabo Mashegoane as Board Chairperson and President, Admire Gwanzura as Vice President and Karel Matthee as Treasurer.

Home workers, SMMEs, healthcare most at risk of increased cyber crime

‘IT professionals must step up efforts to support remote work and education’



The Covid-19 pandemic and lockdown has created new vulnerabilities that fraudsters and cyber criminals have been quick to exploit, IITPSA experts have warned.

Speaking at an IITPSA Western Cape chapter webinar on how to become cyber resilient and more aware during Covid-19, Terence Govender, Director of IT Advisory at Mazars South Africa, said: “Our research has found that top targets for fraud and cyber-crime at the moment include home users, SMMEs and the health sector.”

Govender said home users were particularly vulnerable because remote working users were seemingly more relaxed at home than they were at the office, following the notion that cyber-attacks only happen at the office. In addition, they did not always have anti-virus software, personal firewalls or Virtual Private Network (VPN) software installed.

SMMEs were also an easy target because they did not always have the budget for sophisticated security software, or might not have a CISO or IT professional. And the health industry was a target because of the extensive data in its records, regarded as personal or highly confidential information. This sector was also used as a means to commit fraud, amid people's concerns about Covid-19 and their health.

Noting that cyber-crime increasingly pitted computer against computer, he said: “Covid-19 has brought a trend for hackers to launch more phishing and malware attacks using Covid-19 messaging, and to capitalise on less secure corporate networks.”

While webinar participant polls revealed that 88% were using secure VPNs for home workers and only 38% had experienced phishing or other attacks related to Covid-19, Govender said that many industries other than the IT sector were experiencing a dramatic increase in Covid-19 themed phishing attacks. Govender went on to mention that Google blocked over 240 million COVID-19 related spam emails between March and April 2020 alone.

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“The move from corporate to home is where the exploitation has become vast. We see up to 75 records stolen every second by hackers, and 24% of data breaches as a result of human error through phishing or business process errors. 30,000 websites are now being hacked daily.

The motive for these attacks was largely for financial gain, he said.

Govender said: “The average cost of a stolen record on the black market is around R4,000, with health records (\$408), financial records (\$206) and services records (\$181) the most valuable. The reason these records are so valuable is because they contain so much personal information that can be exploited

To reduce risk, Govender advised organisations to ensure that laptops were up to date with anti-virus software, that relevant VPN software was enabled, to use hard disk encryption with maximum password requirements, and ensure that remote work policies were the same as when working on the network at the office. In addition, home users should ensure that personal computers also have Anti-virus software and personal firewalls for protection.

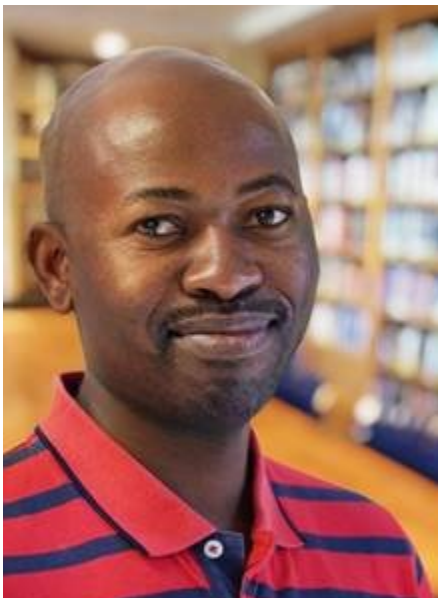
The IITPSA Western Cape chapter webinar was one of a series of webinars IITPSA is rolling out to enhance communication and knowledge sharing among members.

For more information visit www.iitpsa.org.za or <https://www.iitpsa.org.za/upcoming-events/>

Technology presents answer to school closures

ICTs can bridge the gap in learning and pave the way to new models for education

School closures as a result of the Covid-19 pandemic are putting children at risk on a number of fronts. However, technology presents solutions to these challenges. This is according to Admire Gwanzura, Vice President of the IITPSA and an IITPSA Western Cape chapter committee member, who said during a webinar last week that IT professionals had to help enable infrastructure and systems to support education.



“SDG goal number 4 aims to have children complete free primary and secondary education by 2030, with universal access to higher education. However, the global pandemic we are facing now is challenging these goals, with schools around the world having to shut,” he said.

Gwanzura noted that, according to UNESCO, over 67% of students were out of schools because of Covid-19 closures. “Nearly 1.2 billion learners have been affected in 153 countries.

This impacts on their socio-economic status, results in poor nutrition for students who depend on free school meals, and could cause an increased exposure to violence, the risk of teenage pregnancies and a rise in school dropouts.”

He said: “This fast-changing situation requires education institutions to meet the needs of over 1.5 billion students for remote learning. Technology and service providers can add value through digital solutions that address the immediate and long-term needs of students, teachers and researchers.”

The presentation highlighted that technology was making remote learning the new normal, but that remote learning was unevenly distributed; and that physical infrastructure had to be in place to enable remote learning for all students to avoid worsening the digital divide.

With a participant poll finding that 47% of parents now prefer home schooling, Gwanzura said: “The proliferation of technologies challenges education institutions to adapt their teaching and learning models to a changing world. There is an urgent need for new sustainable models for education. Education needs to



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move from a knowledge transfer model to a more collaborative model, and we need to develop the skills needed to succeed in the learning society.”

“There is no one size fits all approach,” he noted. “It will be up to the schools and colleges to find a balance between remote and physical to help them deliver the curriculum, whether they opt for completely remote learning or a blended learning model.”

To optimise remote learning, certain challenges had to be addressed, he said. These included access to the internet, the cost of broadband, and the lack of security in home systems. “As technology practitioners, we have a huge task of making technology work. We need to use the knowledge and skills we have to provide solutions,” he said.

The IITPSA Western Cape chapter webinar was one of a series of webinars IITPSA is rolling out to enhance communication and knowledge sharing among members.

Breaking down barriers – how top women in IT succeed

With still too few women entering the STEM and IT sectors, inspiring women in SA IT give their advice for girls and women on getting ahead in the world of IT



The South African IT sector is still a male dominated arena, but it promises great opportunities for women entering the field.

This is according to panellists on a webinar hosted by the Institute of Information Technology Professionals South Africa (IITPSA) Western Cape Chapter this month.

The panel, comprising four inspiring women in IT and members of the IITPSA's Women in IT committee, said nothing stood in the way of girls and young women entering the field, and they encouraged women already working in IT to help pave the way for other women to enter the field and succeed in it.



Be authentic

Eleni Kwinana, Executive Head for Vodacom Business in KwaZulu Natal, said the world of IT could be an extremely masculine environment and not necessarily always kind to women. “I often find myself the odd one out, as the youngest and a female.” Her approach was to remain unapologetically authentic, she said. “I just be myself – I remain appropriate, but I don't dilute myself. In whatever you do, bring enough of yourself to it, so that way you can authentically be a great contributor.”

Get rid of the box

Kwinana noted that each person is in their own race, and did not need to focus on competing with others, but rather on improving themselves. But she advised women to challenge old norms and stereotypes: “Don't think out of the box – get rid of the box. Let your light shine,” she said.

Because women also often found themselves playing multiple roles at work and home, she said: “Sometimes there aren't enough hours in the day. Prioritise, and be present in what you are doing. You must also take care of yourself.”

Get girls connected

Baratang Miya, founder and CEO of Girlhype coding academy, said that girls and women could be empowered by technology and networks. “If girls don't have access to the internet in this day and age, they

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can't be empowered. They need internet access and computers," she said, and appealed for support in expanding the reach of Girlhype's work.

Overcome fear of failure

On the question of fear of failure, Miya said: It has been my fear that if I fail, I fail all the women behind me. But it's something we need to start dealing with. You need to know your own worth, and that quitting is not always the same as failure. I am not a tree – I can move. There are opportunities."

Senele Goba, Director of 4IR Innovations, founder of Ososayensi Education Advancement, and an IITPSA non-executive director, who holds both a BSc and an Honours Degree in Computer Science from UCT, recounted that she failed her first test in university. With perseverance, and encouragement from her lecturer and friends, she reached the same level as her classmates and got into class merit list.

Accept the challenge

Goba says: "When I got to work, I was again the rose among the thorns. As a minority I felt it was a challenge, rather than a privilege I had to go through this and change that status quo. I started with a negative trust balance – some colleagues feeling I was there as a statistic, rather than on merit." She completed her training successfully and grew through the company, becoming a manager with the authority to recruit. "This was where the real challenge came – I wasn't able to find women in the automation field, and I realised we didn't have the pipeline to bring women into the field. I decided to start my own company to allow me the opportunity to fulfil this need. IT may be challenging but it's not unsuitable for women – they flourish in this field," she said. "At Ososayensi Education, we expose young learners to the basics of computer science and coding, and the results we see are super exciting because parents often tell us their children have also improved in maths and discipline as a result."

Goba said she was encouraged to see many other organisations also promoting the empowerment of girls in STEM and ICT fields. "It's exciting and I hope that collaboration will create mass action that results in huge impact and reach at a faster pace," she said.

Goba noted: "We tend to think women's empowerment takes away power from men – it doesn't. As a woman, if you know your value - it's absolute. We're not in competition with men, we should be on this journey together, so collaboration is important."

Know your worth

On the question of women in IT earning less than their male peers, Moira de Roche, Past President and Non-Executive Director of IITPSA, recounted advice she was given in her first job: "Don't worry about what others earn, worry about what you earn and make sure you get paid what you're worth."

Empowerment of women in IT is one of IITPSA's focus areas, de Roche noted. The IITPSA supports girls and young women studying IT and aims to foster professional leadership, education and mentoring for women IT professionals. Membership to the IITPSA will also help professional women develop a network of people, which supports future career development.

The IITPSA announced the winners of the Computer Applications Olympiad in August this year. The annual Applications Olympiad is a challenge for learners who take CAT or the ICDL or are otherwise computer literate. "I was delighted that so many of the finalists – more than half of them, and the winner, are young women," noted de Roche.

For further information visit www.iitpsa.org.za

Some of forthcoming IFIP events. For a full list of events, please look at <http://www.ifip.org>

28th IFIP/IEEE International Conference on Very Large Scale Integration http://vlsi-soc.pe/	VLSI-SoC	05/10-07/10 2020 Salt Lake City, US	IEEE CASS; IEEE CEDA
ETRIA World Conference TRIZ Future 2020 https://tfc20.eu	TFC2020	14/10-16/10 2020 Cluj-Napoca, RO	ETRIA European TRIZ Association
16th International Conference on Network and Service Management http://www.cnsm-conf.org/2020/	CNSM 2020	02/11-06/11 2020 Izmir, TR	IEEE ComSoc IEEE CS
IFIP Internet of Things 2020 http://ifip-iotconference.org/	IoT 2020	05/11-06/11 2020 ZOOM	IFIP DC IoT
INTERNATIONAL CONFERENCE ON INTEROPERABILITY FOR ENTERPRISE SYSTEMS AND APPLICATIONS http://iesa2020.enit.fr	I-ESA2020	17/11-19/11 2020 Tarbes, FR	I-VLAB, PGSO
21st IFIP / Socolnet Working Conference on Virtual Enterprises http://www.pro-ve.org	PRO-VE 2020	14/09-16/09 2020 Valencia, ES	SOCOLNET - Society of Collaborative Networks
Brazilian Symposium on Computing Systems Engineering	SBESC	24/11-27/11 2020 Florianopolis, BR	Brazilian Computing Society (SBC) / IEEE Industrial Electronics Society (IES)
Working conference on the Practice of Enterprise Modelling https://poem2020.rtu.lv	PoEM 2020	25/11-27/11 2020 Riga, LV	IFIP WG8.1 / IFIP TC8
8th International Conference on Human-Centered Software Engineering https://hcse-conference.com/	HCSE 2020	30/11-02/12 2020 Eindhoven, NL	IFIP WG13.2 / IFIP TC13
9th International Conference on Performance Evaluation and Modeling in Wired and Wireless Networks https://sites.google.com/view/pemwn2020/home	PEMWN 2020	01/12-03/12 2020 Berlin, DE	Ecole Nationale des Sciences de l'Informatique (ENSI), Tunisia / Inria, Paris, France / Freie Universität Berlin, / Einstein Center Digital Future (ECDF), Berlin
5th IFIP Conference on Information Technology in Disaster Risk Reduction http://itdrr.unwe.bg/	ITDRR-2020	03/12-04/12 2020 Sofia, BG	IFIP WG 5.15 / Science Research Center for Disaster Risk Reduction / University of National and World Economy, Sofia, Bulgaria
Histories of Computing in Asia http://ifipwg97.org/workshops/hca2020/	HCA2020	05/12-08/12 2020 Guangzhou, CN	IFIP WG9.7 / IFIP TC9

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