



Information and Communication Technologies (ICTs)

Thematic Research Group

Progress: 2018~19

Dr. Arshad Saleem Bhatti

Dean Sciences



Flow of Presentation

1. Research Themes
2. Projects and Progress
3. Way Forward

Research Themes



National Center for Artificial Intelligence



Big Data
and IoT
Theme 1

- Approved worth **PKR 1098.3** Millions
 - PKR **97.0 Millions** earmarked for Medical Diagnostic Lab at CUI
 - **15** Persons already joined the LAB, **14** more to join
 - Procurement of equipment already initiated
 - **MS in Artificial Intelligence** to be submitted to relevant bodies for approval
- Focal Person : Dr Ahmad Raza Shahid**

ICT4CoP: Levering ICTs for community policing



e-Solutions Theme 3

- Horizon 2020 project with Norwegian Uni of life sciences as lead institute
- Partners from **8** different countries
- Participation and presentation in annual meeting held at Oslo on **Sept 2~8, 2018**
- **Mobile App** for community policing being developed with NGO Rozan
- Conducted Seminar in Islamabad in collaboration with Rozan on **Nov 7, 2018**
- Focal Person : Dr Sajjad A. Madani

5

Cyber Security



Cyber Security Theme 4

- Data Analytics in Network Security
- T-Eye (threat intelligence platform) in collaboration with Trillium Systems.
- SHEPERD (Container Security Platform) in collaboration with WANClouds Inc. US
- Project worth **PKR 120 millions** completed or in progress.
- **PKR 14 Millions** (approved recently) under technology development fund for development of cyber threat intelligence platform by HEC
- Focal Person : **Dr Masoom Alam**

6

Computer Emergency Response



Cyber
Security

Theme 4

- In collaboration with Oman National CERT, a proposal was developed and submitted for funding to COMSATS Head quarters, Islamabad
- COM-CERT will analyze risks and security threats that may be present in cyberspace and communicates this information to users of Internet services and technical information outlets, whether they are public or private institutions, or individuals.
- **Focal Person: Sohail Asghar**

7

Collaboration with South Centre



- In collaboration with South Center, a joint policy paper was prepared by the following authors:

The Fourth Industrial Revolution in the Developing Nations: Challenges and Road Map

Sohail Asghar, Manzoor Illahi Tamimmy, Gulmina Rextina & Tanveer Ahmed

Commission on Science and Technology for Sustainable Development in the South (COMSATS), Islamabad, Pakistan



In August 1995 the South Centre was established as a permanent inter-governmental organization of developing countries.

8

Hybrid Learning Initiative for e-Education: **Digitize or Die**



e-Solutions
Theme 3

- Flexibility in time, space, and pace
- A tailor-made MOOCs, is being developed
- A customized **learning management system and Mobile App** developed that supports online randomized quizzes, discussion boards, live sessions, and video lectures
- In total **23000+** students registered in **3** courses across **7** campuses to-date.
- Focal person: **Sajjad A Madani**

9

Conferences/Workshops



- Frontiers of Information Technology was held **December 17~19, 2018** in Islamabad
- Data Science in Practice: 3rd International Hands on Training Workshop help on **23rd to 27th November 2018**, with trainers from Pakistan, Germany, Netherlands, and UAE. **Focal Person: Sohail Asghar**
- Frontiers of Information Technology technically co-sponsored by IEEE Industrial electronics society and IEEE computer society is planned for **December 16~18, 2019** in Islamabad. **Focal Person: Sajjad A Madani**

10

Publications around the themes [1]



1. Ismail, Saadia, Majed Alshari, Khalid Latif, and Hafiz Farooq Ahmad. "A Granular Ontology Model for Maternal and Child Health Information System." **Journal of Healthcare Engineering** 2017 (2017).
2. Ali, T., Asghar, S. (2019). "Efficient label ordering for improving multilabel chain classifier accuracy". Accepted in Journal of the National Science Foundation of Sri Lanka, ISSN 1391-4588 **Thomson ISI Impact Factor 0.143**.
3. Rehman, S., Asghar, S. (2019). "A-RAFF: A Ranked Frequent FP-Growth Subgraph Pattern Discovery Approach" Journal of Internet Technology. Vol. 2, Issue. 2, Thomson ISI Impact Factor 1.301
4. Nawaz, A., Asghar, S. & Naqvi, S.H.A. (2018). A segregational approach for determining aspect sentiments in social media analysis. Journal of Supercomputing (2018). <https://doi.org/10.1007/s11227-018-2664-3>, ISSN: 0920-8542 (Print) 1573-0484 (Online), **Thomson ISI Impact Factor 1.53**
5. Rehman, S., Asghar, S., Fong, S. (2018). "Optimized and frequent subgraphs: How are they related?" IEEE Access. Vol.6, Issue-1, pp. 37237-37249 Thomson ISI Impact Factor 3.557.

11

Publications around the themes [2]



6. Ijaz, S., Ahmad F., Asghar S., Alam, M. (2018) "Vector Based Genetic Algorithm (VBGA) to Optimize Predictive Analysis in Network Security ". Applied Intelligence, May 2018, Volume 48, [Issue 5](#), pp 1086–1096 <https://doi.org/10.1007/s10489-017-1026-9>, PP 1-11, ISSN: 0924-669X Springer US, Thomson ISI Impact Factor: 1.983
7. Hussain, I., Asghar, S. (2018) "Author Name Disambiguation by Exploiting Graph Structural Clustering and Hybrid Similarity". Arab Journal for Sci Eng (2018). December 2018, Volume 43, [Issue 12](#), pp 7421–7437. <https://doi.org/10.1007/s13369-018-3099-0>. Thomson ISI Impact Factor: 1.092
8. Hussain, I., Asghar, S. (2018) "DISC: Disambiguating Homonyms using Graph Structural Clustering", Journal of Information Science. ISSN: 0165-5515, <https://doi.org/10.1177/0165551518761011> **Thomson ISI Impact Factor: 1.372**
9. Hussain, I., Asghar, S. (2018) "Resolving namesakes using the author's social network", The Turkish Journal of Electrical and Computer Sciences. ISSN: 1300-0632. [Year 2018, Volume 26, Issue 1](#), Pages 554 – 569, Thomson ISI Impact Factor: **0.578**

12

Publications around the themes [2]



10. T. Maqsood, S. A. Madani, B. Nawab, S. Ullah, I. L. P. Nyborg, "Role of ICT in Community-Oriented Policing in South Asia: Challenges and Opportunities", Journal of Human Security, 2019 (In press).
11. J. Ali, R. W. Ahmad, T. Maqsood, JPC Rodrigues, N. U. Haq, S. Sarwar, T. Iqbal, and S. A. Madani. "Network selection in heterogeneous access networks simultaneously satisfying user profile and QoS." International Journal of Communication Systems 31, no. 13 (2018): e3730.
12. S. K. Zaman, J. Shuja, T. Maqsood, F. Rehman, and S. Mustafa. "A Systems Overview of Commercial Data Centers: Initial Energy and Cost Analysis." International Journal of Information Technology and Web Engineering (IJITWE) 14, no. 1 (2019): 42-65.
13. Tahir Maqsood, Nikos Tziritas, Sajjad A. Madani, and Samee U. Khan. "Energy and Communication Aware Task Mapping for MPSoCs" Journal of Parallel and Distributed Computing (2018)

13

Way Forward



- Active collaboration to effectively organize the thematic area
- Meeting cum workshop on the sidelines of FIT of the thematic area members in December **subject to the provision of funds by COMSATS**
- Establishment of center of excellence in cyber security. This is of utmost importance and needs due consideration to counter the current and future threats of the cyber warfare by COMSATS member countries
- Establishment of CoE in IoT and Cloud and Data Science needs consideration

14



Thank you for your attention!