# Center of Research in Network & Telecom (CoReNeT)

## GROUP INTRODUCTION

CoReNeT at Capital University of Science & Technology, Islamabad aims to foster the research and development activities in the rapidly growing field of networks and telecommunications. It initiates innovative ideas in networking and endeavors to contribute in the area of behind the scene technology, which is making today's information revolution possible. CoReNeT team is working on many R&D projects in collaboration with various organizations and was also able to obtain significant research funding which shows a confidence in expertise and dedication of the team.

## GROUP LEAD

### Dr. Amir Qayyum

Dr. Amir Qayyum is a self-motivated and ambitious, having both management and technical expertise with leadership skills to effectively lead a team; creative and visionary thought leader, have numerous publications with over 11,000 citations and is co-author of an RFC in IETF about mobile ad hoc networks. He is actively involved with professional organizations and is Chair IEEE Islamabad Section (2017 to date), Chair Professional Activities IEEE Islamabad Section (2014-2017), Chair IEEE Computer Society Islamabad Chapter (2009-2014), Secretary/Treasurer IEEE Islamabad Section (2011-2013), Founding member & Chair Board of Directors ISOC Islamabad Chapter (2014-2019), Member NomCom at ICANN (2015-2017), Founding Member Board of Directors Pak-France Alumni Network-PFAN (2009 to date), President PFAN (2011-2013) and Vice President PFAN (2014-2017). Dr. Amir Qayyum have 25+ years of R&D experience including more than 13 years of experience as a Project Director of many R&D projects. He is Founding Director of Center of Research in Networks and Telecom and supervised many MS and PhD research thesis. He has more than 20 years of teaching experience along with 16 years of academic management experience, including Dean Quality Enhancement Cell, Dean Faculty of Engineering, Head of Electronic Engineering Department and Chairman Computer Engineering Department. Dr. Amir Qayyum also possesses more than 7 years of industry experience including four years as Technical Team lead in Networks and Data Communications, with expertise in Protocol Stack Development and System Design. For his outstanding contributions, he has been awarded the prestigious medal of "Chevalier dans l'Ordre des Palmes Académiques" by the Government of France.

## RESEARCH AREAS

- Computer Networks: Wired, Wireless and Mobile
- IPv6 and Next Generation Networks (NGN)
- Internet of Things (IoT) and Sensor Networks
- Mobility Management in Heterogeneous Networks
- Mobile and Vehicular Ad Hoc Networks (MANETs / VANETs)
- QoS in Core and Access Networks for Multimedia Applications
- Software Defined Networks (SDNs) and Network Function Virtualization

## EXTERNAL COLLABORATORS & GROUP MEMBERS

1. Dr. Mudassir Tufail (Citi Group, NJ, USA)
2. Dr. Naveed Bin Rais (University of Ajman, UAE)
3. Dr. Nauman Aslam (Northumbria University, UK)
4. Dr. Muhammad Zeeshan (University of Jyväskylä, Finland)
5. Dr. Isabelle Guérin Lassous (University of Lyon 1, France)
6. Dr. Anis Laouiti (Institut Telecom Sud-Paris, France)
7. MS and PhD Students

## SELECTED MS/PhD ALUMNI

### Dr. Shahneela Naz

**Thesis Title:** Resource Efficient Multi-dimensional Cache Management Strategies in Content-Centric Networks. **Year: 2018**

### Dr. Sadaf Yasmin

**Thesis Title:** Cost-Effective Routing and Cooperative Framework for Opportunistic Networks. **Year: 2016**

### Dr. Muhammad Asim Rasheed

**Thesis Title:** Adaptive Routing Update Approach for VANET using Local Neighbourhood Change Information. **Year: 2014**

### Dr. Muhammad Yousaf

**Thesis Title:** End-to-End Mobility Management Framework (EMF) for Multihomed Mobile Devices. **Year: 2013**

### Mr. Abdul Hanan

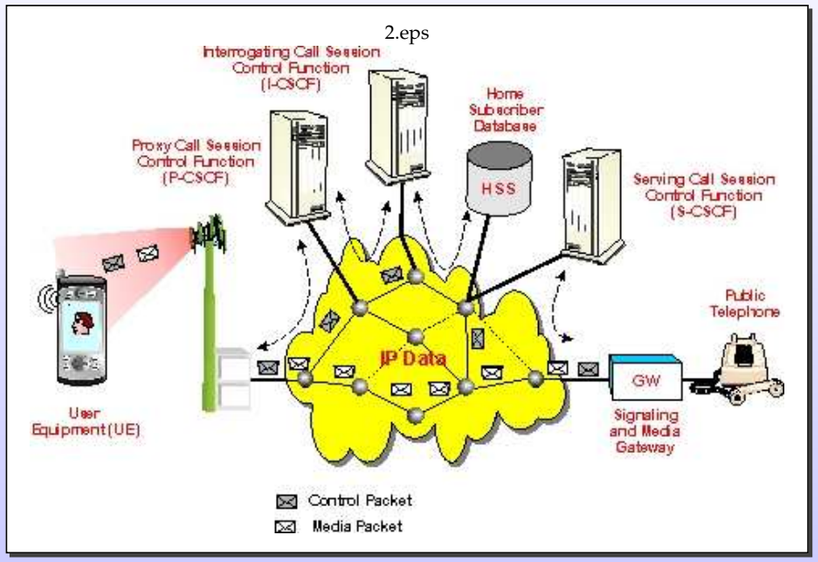
**Thesis Title:** IPv6 Tunneling Protocols: Mathematical and Testbed Setup Performance Analysis. **Year: 2016**

## CURRENT MS/PhD STUDENTS

1. Mr. Sharjeel Gilani
2. Ms. Mukhtiar Bano
3. Mr. M. Umar Qureshi
4. Mr. SaifUllah
5. Mr. Hamza Bin Waheed
6. Mr. Hassan Mehmood
7. Ms. Zahida Wilayat

## SELECTED R&D PROJECTS

- 3GPP-IMS Compliant E2E Mobile IPTV Solution for 4G/LTE Networks focusing on IPTV development over IMS platform, **Funded by Ignite Technology Fund (2018–2019)**
- Framework for Control and Monitoring of Wireless Mesh Networks (WMN) using Software-Defined Networking (SDN), **Funded by HEC Pakistan and Govt of France** under the PHC Peridot Program **(2015–2018)**
- Design and Development of Hybrid IPv4 and IPv6 Network for QoS Enabled Video Streaming Multicast Application focusing on IPv6 and adaptive Video Streaming, **Funded by National ICT R&D Fund (2013–2014)**
- Vehicle based Road/Environment Condition Warning System using vehicular Ad hoc Networks (VANETs), **Funded by Govt. of France under the ICT Asia program (2010–2013)**
- End to End Mobility Management Framework (EMF) for Multihomed Mobile Devices, focusing on TCP Session Management, **Funded by National ICT R&D Fund (2008–2011)**
- EduScope: A New Learning System, **Funded by the Internet Society (ISOC), USA (2010)**
- Design and Implementation of Core Components of 4G Telecom Infrastructure focusing on IP Multimedia Subsystem (IMS), **Funded by National ICT R&D Fund (2007–2009)**




## SELECTED PUBLICATIONS

### Journal Publications

- T. Clausen, P. Jacquet, C. Adjih, A. Laouiti, P. Minet, P. Muhlethaler, A. Qayyum, and L. Viennot, "Optimized Link State Routing Protocol (OLSR), RFC 3626," **Internet Engineering Task Force (IETF)**, 2003 **(6500+ citations)**.
- K. A. Khaliq, O. Chughtai, A. Shahwani, A. Qayyum, and J. Pannek, "An Emergency Response System: Construction, Validation, and Experiments for Disaster Management in a Vehicular Environment," **Sensors**, vol. 19, no. 5, pp. 1–23, 2019.
- K. A. Khaliq, O. Chughtai, A. Shahwani, A. Qayyum, and J. Pannek, "Road Accidents Detection, Data Collection and Data Analysis Using V2X Communication and Edge/Cloud Computing," **Electronics**, vol. 8, no. 8, Article–896, 2019.
- S. Naz, R. N. B. Rais, P. A. Shah, S. Yasmin, A. Qayyum, S. Rho, and Y. Nam, "A dynamic caching strategy for CCN-based MANETs," **Computer Networks**, vol. 142, pp. 93–107, 2018.
- K. A. Khaliq, S. M. Raza, O. Chughtai, A. Qayyum, and J. Pannek, "Experimental validation of an accident detection and management application in vehicular environment," **Computers & Electrical Engineering**, vol. 71, pp. 137–150, 2018.
- K. A. Khaliq, A. Qayyum, and J. Pannek, "Performance Analysis of Proposed Congestion Avoiding Protocol for IEEE 802.11s," **International Journal of Advanced Computer Science and Applications (IJACSA)**, vol. 8, no. 2, pp. 356–369, 2017.
- S. Yasmin, R. N. B. Rais, and A. Qayyum, "Cooperation in Opportunistic Networks: An Overlay Approach for Destination-Dependent Utility-Based Schemes," **Arabian Journal for Science and Engineering**, vol. 42, no. 2, pp. 467–482, 2017.
- S. Yasmin, R. N. B. Rais, and A. Qayyum, "Resource Aware Routing in Heterogeneous Opportunistic Networks," **International Journal of Distributed Sensor Networks**, vol. 2016, pp. 1550–1329, 2016.

### Conference Proceedings

- T. Saraj, M. Yousaf, and A. Qayyum, "IVIPTR: Resource Record for DNS," **Internet draft at IETF, draft-tariq-dnsop-iviptr-01**, 2018.
- S. A. Khaliq, A. Qayyum, and J. Pannek, "Novel Routing Framework for VANET Considering Challenges for Safety Application in City Logistics, in Vehicular Ad-Hoc Networks for Smart Cities," **Advances in Intelligent Systems and Computing**, vol. 548, pp. 53–67, 2017.