

FAHEEM

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RESEARCH INTERESTS

Optimization Theory, Game Theory, Internet of Things, Indoor Localization, Resource Allocation in Data Networks

EDUCATION

Imperial College London

Sept 2016- present

Ph.D. candidate in Electrical and Electronics Engineering
Research Area: Distributed optimization and Game Theory
Advisor: Kin K. Leung

Purdue University

Aug 2014 - May 2016

M.S. in Computer and Information Technology (GPA: 4.0)
Thesis: An iBeacon based indoor positioning and proximity system

University of Engineering and Technology Peshawar

Aug 2008 - July 2013

B.S. Electrical Engineering (GPA: 3.49)
Thesis: Performance Analysis of a Token Bucket Shaper for real world communication streams.

EXPERIENCE

Imperial College

Sept 2016 - Present

Ph.D. Candidate

London, UK

- Carrying out research on distributed optimization and game theory for resource constrained nodes in wireless networks.

US Army Research Laboratory

August 2017 - August 2017

Visiting Researcher

Adelphi, Maryland, USA

- Worked on Optimization Techniques for tactical environments.

Purdue University

Jan 2015 - May 2016

Graduate Research Assistant

West Lafayette, Indiana, USA

- Applied control theory based algorithms for iBeacon-based indoor localization.
- Designed a proximity-based appliance control system.
- Developed *docker* based web applications for IEEE Cyber Security Project.

North Carolina State University

June 2015 - July 2015

Visiting Research Scholar

Raleigh, North Carolina, USA

- Implemented end-to-end system for proximity based services using iBeacons and cloud platform.

Koc University

Sep 2013 - Aug 2014

Graduate Research Assistant

Istanbul, Turkey

- Carried out research on energy efficient Machine to Machine (M2M) Communication in LTE and LTE-A systems.

Center for Intelligent Systems and Networks Research

Mar 2013 - Sep 2013

Research Assistant

Peshawar, Pakistan

- Carried out research on Intelligent Transportation System and smart grids.

University of Engineering and Technology

January 2012 - June 2012

Undergraduate Research Assistant

Peshawar, Pakistan

- Carried out research on traffic shaping in computer networks.

- Developed a maze solving robot using 89C51 micro-controller

TEACHING EXPERIENCE

Purdue University

Graduate Teaching Assistant

Aug 2014 - Jan 2015
West Lafayette, Indiana

- Worked as teaching assistant for CNIT-581: *Introduction to Cloud Computing*.

Koc University

Graduate Teaching Assistant

Sep 2013 - Aug 2014
Istanbul, Turkey

- Worked as teaching assistant for ELEC-316: *Analog and Digital Communication Systems*.
- Worked as teaching assistant for COMP-303: *Computer Architecture*.

CONFERENCE PUBLICATIONS

1. **Faheem Zafari**, Jian Li, Kin Leung, Don Towsley, Ananthram Swami, "A Game-Theoretic Approach to Multi-Objective Resource Sharing and Allocation in Mobile Edge" (*Accepted for publication at ACM Mobicom 2018 workshop on Technologies for the Wireless Edge*)
2. **Faheem Zafari**, Ioannis Papapanagiotou, Thomas J. Hacker, "A novel Bayesian filtering based algorithm for RSSI-based indoor localization." (*Accepted for publication in IEEE ICC 2018*)
3. Nitish Panigrahy, Jian Li, **Faheem Zafari**, Don Towsley, Paul Yu, "What, When and Where to Cache: A Unified Optimization Approach" (*Under review*)
4. Jian Li, **Faheem Zafari (co-primary author)**, Don Towsley, Kin Leung, Ananthram Swami, "Approximation Algorithm for Characterizing Trade-offs among Communication, Computation and Caching with Optimality Guarantees" *In Proceedings of the 2018 ACM/SPEC International Conference on Performance Engineering (pp. 229-240)*.
5. **Faheem Zafari**, Jian Li, Kin Leung, Don Towsley, Ananthram Swami, "E3C3: Enhancing Energy Efficiency among Communication, Computation and Caching with QoI-Guarantee" (*Accepted for publication in IEEE Globecom 2018*)
6. **Faheem Zafari**, Ioannis Papapanagiotou, Michael Devetsikiotis, Thomas J. Hacker, "An iBeacon based proximity detection system." *IEEE International Conference on Communications (ICC)*, Paris, France, 21-25 May. 2017.
7. Saurav Nanda, **Faheem Zafari**, Casimer Decusatis, Eric Wedaa, Baijian Yang, "Predicting Network Attack Patterns in SDN using Machine Learning." *IEEE Conference on Network Function Virtualization and Software Defined Networks (NFV-SDN)*, Palo Alto, CA, USA, 7-9 Nov. 2016.
8. **Faheem Zafari**, Ioannis Papapanagiotou, "Enhancing iBeacon based Micro-Location with Particle Filtering." *IEEE Global Communication Conference (Globecom)*, San Diego, CA, USA, pp. 1-7, 6-10 Dec. 2015.
9. Gul Muhammad Khan, **Faheem Zafari**, S.A. Mahmud, "Very short term load forecasting using Recurrent CGP evolved Artificial Neural Network." *International Conference on Machine Learning and Applications (ICMLA)*, Miami, FL, USA, vol.2, no., pp.152-155, 4-7 Dec. 2013.
10. Jawad Ali, **Faheem Zafari**, Gul Muhammad Khan, Ali Mahmud, "Future Client's request estimation for dynamic resource allocation in cloud data center using CGPANN." *International Conference on Machine Learning and Applications (ICMLA)*, Miami, FL, USA, vol.2, no., pp.331-334, 4-7 Dec. 2013.
11. **Faheem**, F. Humayun, M.I.K. Babar, M.H. Zafar, M.F. Zuhairi, "Performance analysis of a Token Bucket Shaper for MPEG4 video and Real Audio signal." *IEEE International Conference*

on Smart Instrumentation, Measurement and Applications (ICSIMA), Kuala Lumpur, Malaysia, pp.1-4, 25-27 Nov. 2013.

12. Gul Muhammad Khan, Atif Rashid Khattak, **Faheem Zafari**, S.A. Mahmud, "Electrical load forecasting using fast learning recurrent neural networks." *International Joint Conference on Neural Networks (IJCNN)*, Dallas, TX, USA, pp.1-6, 4-9 Aug. 2013

JOURNAL PUBLICATIONS

1. **Faheem Zafari**, Jian Li, Kin Leung, Don Towsley, Ananthram Swami, "E3C3: Enhancing Energy Efficiency among Communication, Computation and Caching with QoI-Guarantee" (*Currently under review in IEEE Transactions on Control of Networked Systems*)
2. Jian Li, **Faheem Zafari (co-primary author)**, Don Towsley, Kin Leung, Ananthram Swami, "Approximation Algorithm for Characterizing Trade-offs among Communication, Computation and Caching with Optimality Guarantees" (*Currently under review in IEEE/ACM Transactions on Networking*)
3. **Faheem Zafari**, Athanasios Gkelias, Kin Leung "A Survey of Indoor Localization Systems and Technologies." *arXiv preprint arXiv:1709.01015* (Submitted for publication to *IEEE Communication Surveys & Tutorials*)
4. **Faheem Zafari**, Ioannis Papapanagiotou, Michael Devetsikiotis, Thomas J. Hacker "An iBeacon based Proximity and Indoor Localization System." *arXiv preprint arXiv:1703.07876*
5. **Faheem Zafari**, Ioannis Papapanagiotou, Konstantinos Christidis, "Micro-location for Internet of Things equipped Smart Buildings." *IEEE Internet of Things Journal*, Vol.3, Issue 1, pp 96-112, 2016.
6. Gul Muhammad Khan, **Faheem Zafari**, "Dynamic Feedback neuro-evolutionary networks for forecasting the highly fluctuating Electrical Loads." *Genetic Programming and Evolvable Machines*, Vol.17, Issue 4, pp. 1-18, 2016.
7. **Faheem Zafari**, G.M. Khan, M. Rehman, S.A. Mahmud, "Evolving Recurrent Neural Network using Cartesian Genetic Programming to Predict the Trend in Foreign currency Exchange Rates." *Applied Artificial Intelligence*, Vol. 28, Issue 6, pp. 597-628, 2014.
8. **Faheem**, S.A. Mahmud, G.M. Khan, M. Rahman, H. Zafar "A Survey of Intelligent Car Parking Systems." *Elsevier Journal of Applied Research and Technology*, Vol. 11, Issue 4, pp 714-726, 2013.

HONORS AND AWARDS

1. Ph.D. Fellowship by Department of Electrical and Electronics Engineering, and EPSRC Center for Doctoral Training in *High Performance Embedded and Distributed Systems (HiPEDS)*, Imperial College London.
2. Awarded travel grant by Dean of College of Technology and Department Head of Computer and Information Technology, Purdue University for 2015 IEEE Global Communication Conference (Globecom) held in San Diego, CA, USA.
3. Selected by US Department of State as one of the 200 students from Pakistan to spend a semester as an exchange student in USA.
4. Ranked 5th out of 10,000 students in the entrance exam of Engineering University in Pakistan.
5. Overall in the top 10 students of the undergraduate Electrical Engineering program in University of Engineering and Technology, Peshawar, Pakistan.

SERVICES

1. Reviewer for *IEEE Transactions on Wireless Communication* (TWC)
2. Reviewer for *Computers and Electrical Engineering* (Elsevier).
3. Reviewer for *Mobile Information System Journal* (Hindawi Publications).
4. Reviewer for *Journal of Traffic and Transportation Engineering* (Elsevier).
5. Technical Program Committee (TPC) member of *IEEE International Conference on Communication (ICC) 2017 SAC Symposium Cloud Communications and Networking Track*.

TECHNICAL STRENGTHS

Programming Languages	Java, C++, Matlab
Databases	MySQL
Others	Latex, Amazon Web Services, git

REFERENCES

Dr. Kin K. Leung (FIEEE) Professor Imperial College London, UK kin.leung@imperial.ac.uk	Dr. Ioannis Papapanagiotou Senior Architect Netflix, Los Gatos California, USA ipapapa@ncsu.edu	Dr. Don Towsley (FIEEE) Professor University of Massachusetts, Amherst Massachusetts, USA towsley@cs.umass.edu
Dr. Thomas J. Hacker Professor Purdue University, W. Lafayette Indiana, USA tjhacker@purdue.edu	Dr. Michael Devetsikiotis (FIEEE) Professor/Department Head University of New Mexico, Albuquerque New Mexico, USA mdevets@ncsu.edu	