SHAFIQUE AHMAD CHAUDHRY

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PROFILE

- Proposed novel research projects and managed research grants of around US$ 1 Million.
- Designed and implemented prototypes for Internet of Things, Service Discovery and Provisioning Systems, Intelligent monitoring, Smart Home and Building Monitoring, and Cyber Physical systems.
- Published over 40 articles in high quality international journals and conferences.
- Supervised a number of graduate and undergraduate projects.

RESEARCH INTERESTS

- Internet of Things
- Data Analytics and AI
- Wireless Sensor Networks
- Smart Spaces
- Autonomic Network Management

CURRENT AFFILIATON

Assistant Professor July 2020 – Present
Reh School of Business, Clarkson University
Courtesy Research Assistant Professor
Department of Computer Science, Clarkson University

PROFESSIONAL PREPERATION

Postdoctoral Fellow (Postdoc) Jul 2008 – Jul 2009
MISL, University College Cork, Ireland

PhD, Ajou University, Korea Feb 2008
Thesis: A Service Discovery Architecture for IP-based Wireless Sensor Networks
Supervisor: Dr. Ki-Hyung Kim

Masters in Computer Science, University of the Punjab, Pakistan Aug 1998
Thesis: B2B Transactions: From EDI to XML
Supervisor: Mr. Muhammad Idrees

Post Graduate Diploma in Computer Science Aug 1996
University of the Punjab, Pakistan
Project: Computerized Reservation System of a Travel Agency

ACADEMIC EXPERIENCE

Associate Professor, Dhofar University, Oman	Sep 2017 – Aug 2019
Assistant Professor, Dhofar University, Oman	Sep 2012 – Aug 2017
Assistant Professor, Al-Imam Muhammad bin Saud University, KSA	Oct 2009 – Feb 2012
Post-Doc Researcher, National University of Ireland, Cork, Ireland	Jul 2008 – Jul 2009
Senior Lecturer, University of Management and Technology, Pakistan	Mar 2001 – Feb 2004
Lecturer, University of the Punjab, Lahore, Pakistan	Jun 2000 – Feb 2001
Lecturer, Petroman Computer College, Lahore, Pakistan	Sep 1998 – Feb 2000

RESEARCH GRANTS

6-IMS: Intelligent Monitoring with Cooperative Objects using 6LoWPAN Jan 2016 – Dec 2018
Role: Principal Investigator
Grant (OMR 103700 = US$ 268500) Approved from The Research Council of Oman.
Project Scope: This project is aimed at the design of large-scale and interoperable architecture of heterogeneous networks and applications for intelligent monitoring systems using 6LowPAN as the core sensing and communication protocol. The project also focuses on integration of 6LoWPAN with service oriented architecture.

SNEPMURe: Sensor Networks for Enhanced and Personalized Management of Recourses
Role: Principal Investigator Nov 2010 – Jun 2013
Research Grant (OMR 39000 = US$ 102000) from The Research Council of Oman.
Project Scope: This project was envisioned to provide resource management and personalized applications using Sensor Networks. The two prototypes under design are ocean observation and traffic management.

Network and QoS Management for IP-Based Wireless Sensor Networks May 2010 – Aug 2011
Role: Principal Investigator
Research Grant (SAR 75000 = US$ 20000) Research Deanship, Imam University, Saudi Arabia
Project Scope: This research project has been focused on development of network and Quality of Service (QoS) management of 6lowpan network and Internet of Things (IoT).

Z-Monitor: Network Monitoring tool for Zigbee Networks May 2010 – Aug 2011
Role: Co-Principal Investigator
Research Grant (SAR 71250 = US$ 19000) Research Deanship, Imam University, Saudi Arabia
Project Scope: This work has produced a WSN monitoring application Z-Monitor which has been distributed as a free tool. The application has been used by various research groups worldwide and is a valuable tool for low power wireless sensor networks.

RESEARCH EXPERIENCE

Principal Investigator Jan 2016 – Dec 2018
6-IMS: Intelligent Monitoring with Cooperative Objects using 6LoWPAN - Dhofar University
Envisioned and proposed the project for intelligent monitoring of Salalah port to enhance workers' safety. Managed the project work-packages, team, progress, documentation and budget. Established research collaborations with industry and international research groups. Published research results in international conferences and journals.

Principal Investigator Nov 2012 – Jun 2014
SNEPMURe: Sensor Networks for Enhanced and Personalized Management of Recourses
Designed and developed application scenarios for personalization of information needs for users for road safety. Created the scenarios for road safety and target localization. Managed project team and budget.

Researcher Aug 2009 – Dec 2011
R-Track: Distributed Multi-Robot Tracking and Collaboration System
Designed an IP-based Wireless Sensor Network (6LoWPAN) test-bed for tracking, localization and collaboration of multiple robots. Supervised the implementation of a communication mechanism between 6LoWPAN network and Wi-Fi Robots. This work tackled the constraints of low-power communication, routing as well as mobility in the network. Participated in design of tracking, localization and hurdle-avoidance algorithms using odometery and yaw-rate awareness.

Principal Investigator May 2010 – Dec 2011
6lowNetQoS: Network and QoS Management for IP-based Sensor Networks
Designed network management and QoS frameworks for IP-based WSNs (6LoWPANs). The frameworks are policy-based and can be used with various user-requirements and settings. The key object was to provide the desired level of Network and QoS management. Acted as the project manager from envision to the completion.

Co-Investigator May 2010 – Dec 2011
Z-Monitor: Network Monitoring Tool for Zigbee and 6LoWPAN Networks
Collaborated in the design of Z-Monitor, GUI based tool for monitoring Zigbee as well as 6LoWPAN networks. Participated in the software and component design of Z-Monitor. The code for the tool has now been distributed via with Google code under GNU GPL license.

Postdoc – University College Cork, Ireland Jul 2008 – Jul 2009
Embedded Networks (EmNETs) - An Enterprise Ireland Funded Project
Supervised the design and deployment of 6LoWPAN test-bed that was used as a core sensing technology for building management system. Designed and supervised the development of network management framework for (IP-based) wireless sensor networks. Interacted with other partner (Cork Institute of Technology) to realize a test-bed for large-scale building management system using IP-based wireless sensor networks. A working demo was presented at EWSN 2009, a premier conference is WSN domain.

Researcher / PhD Student Feb 2004 – Feb 2008
Ajou University Korea

Network Management
Designed autonomic management framework for U-Zone, a hybrid of wireless mesh and MANETs. This work provides an autonomic, policy-based, context-aware and hierarchical manager-agent framework that is adaptable and robust to network variations, node failures, and dynamic user requirements. This project is one of the 21st century frontier R&D programs supported by the Ministry of Science and Technology (MOST) in Korea. Contributed in the design and development of LNMP, a lightweight network management protocol for 6LoWPAN. This work is one of the pioneers in Network Management of 6LoWPAN networks.

Smart Home
Participated in the creation of an autonomic, context-aware remote manager for smart home environment. This work includes design and development of a pervasive home environment where different devices are integrated using OSGI framework, which is used to access and control the network through the Internet.

Service Discovery in 6LoWPAN
Designed and developed the first service discovery protocol for 6LoWPAN. The proxy-based service discovery protocol finds proximity-based services in IP-based wireless sensor networks (IP-USN). Contributed in the design and development of 6LoWPAN (IPv6 over IEEE 802.15.4 networks) routing protocols (LOAD, DYMO-low and HiLOW).

TEACHING

Clarkson University

IS 211: Applied Data Analytics (Spring ’21 ’20, Fall ’20)
IS 237: Into to Application Development (Spring ’21 ’20)
IS 314: Database Management (Fall ‘20)
IS 400: Process and System Analysis (Fall ‘20)
IS 426: Big Data Architecture (Fall ‘20)
IS 487: Special project – Advanced Analytics (Spring ‘ 21)

Dhofar University, Oman

Graduate Courses

CMPS 510: Computer Networks and Security (Spring ’13 ’14, Fall ’16)
CMPS 540: Trends in Information Technology (Fall ’14, Spring ’16 ’18)
CMPS 560: Object Oriented Software Development (Spring ’14 ’15 ’17)
CMPS 601: Research Topic in Information Technology (Fall ’15, Spring ’17)

Undergraduate Courses

CMPS 110: Introduction to Programming (Fall '17 '18)
CMPS 200: Systems Analysis and Design (Spring '12, Fall '17)
CMPS 250: Computer Networks (Fall '13 '14 '15)
CMPS 260: Operating Systems (Spring '12 '13 '14)
CMPS 315: Advanced Programming with C++ (Spring '12)
CMPS 320: Computer Security (Fall '13 '15)
CMPS 440: Android Application Development (Spring '17 '18)

Course Development

CMPS 510: Computer Networks and Security
CMPS 540: Information Technology Project Management
CMPS 560: Object Oriented Software Development
CMPS 601: Research Topic in Information Technology
CMPS 433: Modeling and Simulation (in collaboration with Dr. Anis Koubaa at Al-Imam)
EE 702: Special topics in Ubiquitous Computing (with Prof. Yoon at Ajou)
CMPS 601: Research Topic in Information Technology (Fall '15)

ADMINISTRATIVE EXPERIENCE

Chairperson, Department of Computer Science, Dhofar University Sep 2017 – Jun 2019
Member, University Research Board, Dhofar University Sep 2016 – Aug 2018
Chairperson, College Research Council, Dhofar University Sep 2013 – Aug 2016
Member, College Examination Committee, Dhofar University Sep 2014 – Aug 2016
Member, Master's Program Committee, Dhofar University Sep 2014 – Jun 2019
Member 'Teaching Quality Assurance Committee (Al-Imam University)
Director / Program Advisor BS (CS) Program (University of Management and Technology)

- Defined roadmap for the program was defined based on the required proficiencies in the prospective graduates. The process involved collaboration with teachers, managers, students, industry and educationists.
- Collaborated with different entrepreneurs and industry in order to generate projects for undergraduate students, in fields like e-Business, wireless communication, and artificial intelligence etc.
- Participated in curriculum design for BSCS program.
- Outlined the procedures for student counseling and advising for BS program.

GRADUATE STUDENT SUPERVISION

Project: Improving Tourism in Dhofar using Social Media
Student: Awadh Al-Hadi
University: Dhofar University, Oman
Completion Date: February 2017.

Project: Mitigating Caller ID Spoofing
Student: Naef Al-Muati
University: Dhofar University, Oman

Completion Date: December 2016.
Project: Quality of Experience for Mobile Internet in Oman
Student: Musallem Al-Katheri
University: Dhofar University, Oman
Completion Date: May 2017.

Project: Impacts of Social Media on Academic Performance in Oman
Student: Seham Shanfari.
University: Dhofar University, Oman
Completion Date: December 2016.

Project: QoS Provisioning in 6LoWPAN
Role: Co-Supervisor with Pr. Cormac Sreenan.
Student: Jun Zhang.
University: National University of Ireland, Cork, Ireland.
Completion Date: May 2009.

Project: Service Discovery in Cooperative Urban Networks
Student: Jun Zhang.
University: National University of Ireland, Cork, Ireland.
Completion Date: May 2009.

Project: Self-Healing in WSN
Role: Co-Supervisor with Prof. Cormac Sreenan.
Student: Chen Chen.
University: National University of Ireland, Cork, Ireland.
Completion Date: May 2009.

PATENTS

- Method of Operating Directory Proxy Agent in Low Power Wireless Personal Area Network, Method of Searching for Specific Service Information Therein, And Directory Proxy Agent Performing the Same Therein, US Patent 12/525653, April 2010. *http://www.freepatentsonline.com/y2010/0105327.html*
- SSLP Processing Device Submitted to Korean Patent Office under patent claim # 10-2007-0011312

AWARDS AND HONORS

Best Research Scholar in College award 2015 by Dhofar University
Excellent achievement award 2006 by Korean Government for research in ubiquitous and pervasive environments (from Institute of Information Technology Advancement)
Outstanding Paper Award for the paper "A Routing Overlay for Wireless Sensor Networks with Multiple Services Support," Korea International Next Generation Personal Computer Conference (KINGPC), Seoul, 3-4 Nov, 2005, pp. 171-175.
Korean Government IT scholarship for PhD (2004-2008).
Best Teacher award at University of Management and Technology, Lahore for the year 2002.
Lead 1st UMT Brain Storming Workshop for curriculum and course design at UMT.

SELECTED PUBLICATIONS

Book Chapters

- Hamid Mukhtar, Ali Hammad Akbar, Shafique Ahmad Chaudhry, Kim Ki-Hyung, Yoo Seung-Wha, "Network Management in Wireless Sensor Networks,", RFID and Sensor Networks: Architectures, Protocols, Security and Integrations, CRC publishers, ISBN-13: 978-1420077773.
- Shafique Ahmad Chaudhry, Ali Hammad Akbar, Ki-Hyung Kim, "Proxy-based service discovery and network selection," Ubiquitous Computing and Communication by IDEA-group http://idea-group.com/

Journal Articles (Chronological Order)

[1] Saima Zafar, Abeer Bashir, Shafique Ahmad Chaudhry, "Mobility-aware Hierarchical Clustering in Mobile Sensor Networks", IEEE Access, 2019. DOI: 10.1109/ACCESS.2019.2896938 **(Impact Factor 3.559)**

[2] Beenish Ayesha Akram, Amna Zafar, Ali Akbar, Bilal Wajid, Shafique Ahmad Chaudhry. Change Detection Algorithms for Surveillance in Visual IoT: A Comparative Study Visual Internet of Things. Mehran University Research Journal of Engineering and Technology, Mehran University of Engineering and Technology, Jamshoro, Pakistan, 2018, 37 (1), pp.77-94.

[3] Saima Zafar, Shafique Ahmad Chaudhry, Sara Kiran, "Adaptive TrimTree: Green Data Center Networks through Resource Consolidation, Selective Connectedness and Energy Proportional Computing." Energies, Vol. 9 No 10. October 2016. **DOI**:10.3390/en9100797 (**Impact Factor 2.077)**

[4] Saima Zafar, Abeer Bashir, Shafique Ahmad Chaudhry, "On implementation of DCTCP on three-tier and fat-tree data center network topologies", SpringerPlus, Vol. 5 No. 1. June 2016. **DOI**: 10.1186/s40064-016-2454-4 (**Impact Factor 0.982)**

[5] Shafique Ahmad Chaudhry and Jun Zhang, "Network-State-Aware Quality of Service Provisioning for the Internet of Things" International Journal of Advanced Computer Science and Applications (IJACSA), Vol. 7 No. 6, 2016. pp 369 – 376. **DOI:** 10.14569/IJACSA.2016.070648

[6] Andri Mirzal and Shafique Ahmad Chaudhry, "Call for a Computer-Aided Cancer Detection and Classification Research Initiative in Oman", Asian Pacific Journal of Cancer Prevention, Vol. 17. No. 5. pp 2375-2382. June 2016. DOI: 10.7314/APJCP.2016.17.5.2375

[7] Junaid Ahsenali Chaudhry, Shafique Ahmad Chaudhry, Robert Rittenhouse, "Phishing Attacks and Defenses", International Journal of Security and Its Applications, Vol. 10. No.1 (2016) pp. 247-256.

[8] Shafique Ahmad Chaudhry, "On the Need of Source Address for Route-Error Delivery in 6LoWPAN," Journal of Computer Science, Vol. 11 No. 8., Nov 2015. pp 902-914. **DOI:** 10.3844/jcssp.2015.902.914

[9] Shafique Ahmad Chaudhry, Weiping Song, Muhammad Habeebvulla, and Cormac Sreenan, "EMP: A Protocol for IP-Based Wireless Sensor Networks Management," International Journal of Ubiquitous Systems and Pervasive Networks, JUSPN, Vol 2, No. 1, pp 15-22, April 2011.

[10] Mohsen Rouached, Shafique Ahmad Chaudhry, Anis Koubaa, "LoWPANs Meet Service Oriented Architecture," International Journal of Ubiquitous Systems and Pervasive Networks, Vol 1, No1, December 2010.

[11] Shafique Ahmad Chaudhry, Ali Hammad Akbar, Ki-Hyung Kim, "On the Interplay of proximity and Ubiquity," IEICE Transactions on Communication, Vol. 90-B, No. 12, Dec 2007. **(Impact Factor 0.3)**

[12] Ali Hammad Akbar, Ahmad Ali Iqbal, Waleed Mansoor, Shafique Ahmad Chaudhry, and Ki-Hyung Kim," Longevity Enhancing Measures for Sensor Grids," KNOM Review Vol. 8, No. 2, February 2006.

Conference papers

[1] Hedi Haddad, Zied Bouyahia, Shafique Chaudhry, "A Multiagent Geosimulation and IoT-based Framework for Safety Monitoring in Complex Dynamic Spatial Environments," Accepted in The 10th International Conference on Ambient Systems, Networks and Technologies (ANT) April 29 - May 2, 2019, Leuven, Belgium

[2] Malathi Balaji and Shafique Ahmad Chaudhry, "A cooperative trilateration technique for object localization", 20th IEEE ICACT, Korea, February 2018.

[3] Junaid Ahsenali Chaudhry, Shafique Ahmad Chaudhry, Robert Rittenhouse, "Phishing: Classification and Countermeasures," Mulgrab 2015, Jeju, Korea, November 25-27, 2015.

[4] Olfa Gaddour, Anis Koubâa, Shafique Chaudhry, Miled Tezeghdanti, Rihab Chaari, Mohamed Abid, "Performance Evaluation of DAG with RPL," (to appear in) 3rd IEEE Conference on Communication and Networking (COM'NET 2012), Tunisia, March 29-April 01, 2012.

[5] Anis Koubaa, Shafique Chaudhry, Olfa Gaddour, Rihab Chaari, Nada Al-Elaiwi, Hanan Al-Soli, Hichem Boujelben, "Z-Monitor: Monitoring and Analyzing IEEE 802.15.4-based Wireless Sensor Networks," 6th IEEE LCN Workshop on Network Measurements, in conjunction with 36th IEEE Conference on Local Computer Networks (LCN 2011), Bonn, Germany, October 04, 2011.

[6] Shafique Ahmad Chaudhry, Shen Yong, "Service Discovery in Urban Cooperative Networks," International Conference on Wireless Networks (ICWN), Las Vegas, USA, July 18-21, 2011.

[7] Yasir Javed, Shafique Ahmad Chaudhry, "Performance Evaluation of Machine Learning Methods for Intrusion Detection," SAMS 2011, Las Vegas 2011, July 18-21, 2011.

[8] Shafique Ahmad Chaudhry, George Boyle, Weiping Song and Cormac Sreenan, "EMP: A Network Management Protocol for IP-based Wireless Sensor Networks," IEEE International Conference on Wireless and Ubiquitous Systems, Sousse, Tunisia, October 8-10, 2010.

[9] Jun Zhang, Yasir Javed, Shafique Ahmad Chaudhry, "QoS Provisioning in IP-based Wireless Sensor Networks,"International Conference on Wireless Networks, ICWN' 10, Las Vegas, USA, July 7-9, 2010.

[10] S. Zafar, A. H. Akbar, ; M. Amjad, S. Shams, S. A. Chaudhry, Jung Seuk, Byeong-hee Roh, Ki-Hyung Kim; "BRIDGE: Border-node assistance for diffusion through a gating mechanism for collocated WPANs," 6th IEEE International Conference on Emerging Technologies (ICET 2010), October 2010, Page(s): 76 - 81

[11] Shafique Ahmad Chaudhry, Cormac Sreenan, "Supporting Address Auto-configuration in IP-based Wireless sensor networks," IEEE ITNG 2009, Nevada, USA, April 27-29, 2009.

[12] Hamid Mukhtar, Shafique Ahmad Chaudhry, Ali Hammad Akbar, Kang-myo Kim, Ki-Hyung Kim, Seung wha Yoo, "LNMP- Management Architecture For Ipv6 Based Low-Power Wireless Personal Area Networks (6lowpan)," IEEE NOMS '08, April 7-11, 2008.

[13] Taqi Raza Mehdi, Ali Hammad Akbar, Shafique Ahmad Chaudhry, Gargi Bag, Seoung Hwa Yoo and Ki-HYung Kim, "A Yaw Rate Aware Sensor Wakeup Protocol (YAP) For Target Prediction And Tracking In Sensor Networks", MILCOM 2007, Orlando, Florid, October 29-31, 2007.

[14] Shafique Ahmad Chaudhry, Faysal Adeem Siddiqui, Ali Hammad Akbar, and Ki-Hyung Kim, "NETSAQ: Network State Adaptive QoS Provisioning in MANETs," Elsevier Lecture Notes in Computer Science 4238, pp. 170-179, 2006.

[15] Shafique Ahmad Chaudhry, Won-Do Jung, Ali Hammad Akbar, and Ki-Hyung Kim, "Proxy-Based Service Discovery and Network Selection in 6LoWPAN," Elsevier Lecture Notes in Computer Science 4208, pp. 525-534 (2006).

[16] Shafique Ahmad Chaudhry, Faysal Adeem Siddiqui, Ali Hammad Akbar, and Ki-Hyung Kim, "Autonomic Network Management for Wireless Mesh and MANETs," IWSOS, Germany, September 13-15, 2006.

[17] Shafique Ahmad Chaudhry, Ali Hammad Akbar, Kim Ki-Hyung, Suk-Kyo Hong, and Won-Sik Yoon, "HYWINMARC: An Autonomic Network Management Architecture for Wireless Hybrid Networks", NCUS '06, Korea, August 1-4, 2006.

[18] Shoaib Mukhtar, Ali Hammad Akbar, Shafique Ahmad Chaudhry, Won-Sik Yoon, Ki-Hyung Kim, and Suk-Kyo Hong, "Mitigating Broadcast Storms in Stateless Address Auto-Configuring MANETs," The 2006 International Conference on Computational Science and its Applications ICCSA 2006 (LNCS), Scotland, 8-11 May, 2006.

[19] Jung Won-do, Shafique Ahmad Chaudhry, Ali Hammad Akbar, Sohn Young-ho and Kim Ki-Hyung, "Route Error Reporting Schemes for On-Demand Routing in 6LoWPAN", GPC, Taiwan, May 3-5,2005.

[20] Ali Kashif Bashir, Ali Hammad Akbar, Shafique Ahmad Chaudhry, Chauhdary Sajjad Hussain, Ki-Hyung Kim, "Collaborative Detection and Agreement Protocol for Routing Malfunctioning in Wireless Sensor Networks", ICACT 2006, Phoenix Park Korea, Feb 20-22 2006.

[21] Ali Hammad Akbar, Waleed Mansoor, Shafique Ahmad Chaudhry, Ali Kashif, Ki-Hyung Kim, "Node-link-failure Resilient Routing Architecture for Sensor Networks", ICACT 2006, Phoenix Park Korea, Feb 20-22 2006.

[22] Jung Won-do, Shafique Ahmad Chaudhry, Ali Hammad Akbar, Sohn Young-ho and Kim Ki-Hyung, "Route Error Reporting Schemes for 6LoWPAN", IT-SOC 2005, Seoul, Korea, November 3-5, 2005.

[23] Ali Hammad Akbar, Waleed Mansoor, Shafique Ahmad Chaudhry, Ali Kashif, and Ki-Hyung Kim, "Longevity techniques for sensor grids", IT-SOC 2005, Seoul, Korea, November 3-5, 2005.

[24] Ali Hammad Akbar, Ahmad Ali Iqbal, Shafique Ahmad Chaudhry, Chaudhary Sajjad Hussain, Ki-Hyung Kim, "A Routing Overlay for Wireless Sensor Networks with Multiple Services Support", IT-SOC 2005, Seoul, Korea, November 3-5, 2005.

[25] Ali Hammad Akbar, Ahmad Ali Iqbal, Shafique Ahmad Chaudhry, Chaudhary Sajjad Hussain, Ki-Hyung Kim, "A Routing Overlay for Wireless Sensor Networks with Multiple Services Support," (Outstanding Paper Award) Korea International Next Generation Personal Computer Conference (KINGPC), Seoul, 3-4 Nov, 2005, pp. 171-175.

Technical Reports

[26] "6-IMS: Intelligent Monitoring with Cooperative Objects using 6LoWPAN", Final Technical report submitted to TRC, Oman, 2019

[27] "SNEPMURe: Sensor Networks for Enhanced and Personalized Management of Recourses", Technical report submitted to TRC, Oman, 2014

[28] "R-Track: Multi-Robot tracking using Wireless Sensor Networks", Technical report for R-Track project, 2011

[29] "Network Management of Wireless Sensor Networks," submitted to deanship of research, Al-Imam Muhammad bin Saud University, Saudi Arabia, 2010

[30] "EmNetS: Embedded Networked Systems", Technical report submitted to Enterprise Ireland, 2009

[31] "Network Management of Wireless Mesh and Manets," Telecom Research Lab, Ajou University, Korea, 2005.

REFERENCES

Can be furnished on request