# Junaid Ahmed Khan

Postdoctoral Research Fellow
Department of Computer Science
University of Memphis

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## RESEARCH INTERESTS

Connected and Autonomous Vehicles (CAVs), Internet of Things (IoTs),
Edge/Fog Computing and Information/Content Centric Networking (ICN/CCNs)

## EDUCATION

**Ph.D., Computer Science, 2013-2016**
University Paris-Est Marne-La-Vallée, France
Dissertation: Large scale data collection and storage using smart vehicles

**MS, Electrical Engineering, 2010-2013**
National University of Sciences And Technology, Islamabad, Pakistan
Thesis: Modeling of energy storage capacity for harvesting enabled sensors

**BS, Telecommunications Engineering, 2005-2009**
National University of Computer & Emerging Sciences, Islamabad, Pakistan

## EMPLOYMENT

**University of Memphis, Memphis, TN, USA, 01/2018 - Present**
Postdoctoral Research Fellow - Computer Science Department
Edge Computing and Machine Learning for data collection and analysis in Cyber-Physical Systems

**INSA Lyon, France, 10/2016 - 12/2017**
Postdoctoral Researcher - Inria Agora Team, CITI Lab
Energy-efficient self-organization of large scale Internet of Things (IoT) devices

**University of California, Santa Cruz, CA USA, 06/2016 - 10/2016**
Visiting Research Fellow - Computer Engineering Department
Collaborative cache management and content placement in Information Centric Networks (ICN)

**University of La Rochelle, La Rochelle, France, 01/2016 - 09/2016**
Doctoral Researcher - Laboratoire Informatique, Image, Interaction (L3i)
Autonomous data storage and distribution in an urban environment using Connected Vehicles

**University Paris-Est Marne-la-Vallée, France, 08/2013 - 12/2015**
Doctoral Researcher - Laboratoire d'Informatique Gaspard Monge (LIGM)
Distributed schemes to incentivize and recruit vehicles for large scale data collection

**NUST - SEECS, Islamabad, Pakistan, 09/2011 - 05/2013**
Research Assistant - Wireless and Secure Networks Laboratory (WiSNet)
Modeling energy storage capacity for solar powered nodes in Wireless Sensor Networks (WSN)

**National Telecommunication Corporation, Islamabad, Pakistan, 02/2010 - 03/2011**
NIP Trainee - Network and System Engineering Department

## FUNDING

**Map901: Building Rich Interior Hazard Maps for First Responders, 2018-2019**
National Institute of Standards and Technology (NIST). $500,000
Role: Proposal writing, student mentoring, PI: Lan Wang
Deep learning for the collection, annotation, and processing of Big-data from LiDAR, cameras and other sensors to build indoor 3D maps of 1.86 million sqft. space for first responders.

**RINAVOP, 2018-2019**
FedEx Institute of Technology. $30,000
Role: Co-PI, PI: Lan Wang
Machine learning based Edge computing testbed for **R**eal-time **I**nteractions and **N**avigation of **A**utonomous **V**ehicles for **O**ptimized **P**ackage delivery in a campus-like environment.

Pending

**Smart CATS: A Smartphone-enabled Citizens Activity-based Travel Survey with Privacy-preserving, 2018**
Tennessee Department of Transportation (TDOT). $200,000
Role: Co-PI, PI: Lan Wang

**901CARS: Challenged-adult Autonomous Ride Service, 2019**
US Department of Transportation (USDOT). $1,500,000
Role: Co-PI, PI: Sabya Mishra

## PUBLICATIONS

Journals published

1. **Junaid Ahmed Khan**, Yacine Ghamri-Doudane, "ROVERS: Incentive-based Recruitment of Connected Vehicles for Urban Big Data Collection", *IEEE Transactions on Vehicular Technology*, 2019 (In press).

2. **Junaid Ahmed Khan**, Yacine Ghamri-Doudane, "SAVING: Socially Aware Vehicular Information-centric Networking", *IEEE Communications Magazine*, Aug 2016.

3. **Junaid Ahmed Khan**, Yacine Ghamri-Doudane, Dmitri Botvich, "Autonomous Identification and Optimal Selection of Popular Smart Vehicles for Urban Sensing - An Information-centric Approach", *IEEE Transactions on Vehicular Technology*, 2016.

4. **Junaid Ahmed Khan**, Hassaan Khaliq Qureshi, Adnan Iqbal, "Energy Management in Wireless Sensor Networks: A Survey", *Journal of Computers and Electrical Engineering*, 2014.

Journals submitted

1. **Junaid Ahmed Khan**, Yacine Ghamri-Doudane, Cedric Westphal, "Information-Centric Fog Network for Incentivized Collaborative Content Caching and Retrieval in Internet of Everything (IoE)", *IEEE Communications Magazine*, 2019 (Major review).

2. **Junaid Ahmed Khan**, Lan Wang, Eddie Jacobs, Ahmadreza Talebian, Sabya Mishra, Mike Golias, Charles Santo, and Carmen Astorne-Figary, "Smart Cities Policy and Infrastructure Readiness Index Towards Connected and Autonomous Vehicles", *IEEE Communications Magazine*, 2019.

3. **Junaid Ahmed Khan**, Yacine Ghamri-Doudane, "Social Welfare Optimization Game to Find and Recruit Vehicles for Content Caching in CCNs", *IEEE Transactions on Vehicular Technology*, 2019.

4. Ahmadreza Talebian, Sabya Mishra, Mike Golias, **Junaid Ahmed Khan**, Charles Santo, Lan Wang, Eddie Jacobs and Carmen Astorne-Figary, "A holistic index for evaluating readiness to accommodate connected autonomous vehicles", *Transport Policy*, 2019.

Conferences

1. Bouziane Brik, **Junaid Ahmed Khan**, Yacine Ghamri-Doudane, Nasreddine Lagraa, "PUBLISH: A Distributed Service Advertising Scheme for Vehicular Cloud Networks", *IEEE CCNC*, 2019.

2. **Junaid Ahmed Khan**, Cedric Westphal, J.J. Garcia-Luna-Aceves, Yacine Ghamri-Doudane, "NICE: Network-oriented Information-centric Centrality for Efficiency in Cache Management", *ACM ICN*, 2018.

3. **Junaid Ahmed Khan**, Cedric Westphal, Yacine Ghamri-Doudane, "A Popularity-aware Centrality Metric for Content Placement in Information Centric Networks", *IEEE ICNC*, 2018.

4. Mariem Harmassi, **Junaid Ahmed Khan**, Cyril Faucher, Yacine Ghamri-Doudane, "Welcome: Low Latency and Energy Efficient Neighbor Discovery for Mobile and IoT Devices", $14^{th}$ *IEEE WiMob*, 2018.

5. Bouziane Brik, **Junaid Ahmed Khan**, Yacine Ghamri-Doudane, Nasreddine Lagraa, Abderrahmane Lakas, "GSS-VC: A Game-theoretic Approach for Service Selection in Vehicular Cloud", *IEEE CCNC*, 2018.

6. **Junaid Ahmed Khan**, Romain Pujol, Razvan Stanica, Fabrice Valois, "On the Energy Efficiency and Performance of Neighbor Discovery Schemes for Low Duty Cycle IoT Devices", $14^{th}$ *ACM PE-WASUN* 2017.

7. **Junaid Ahmed Khan**, Cedric Westphal, Yacine Ghamri-Doudane, "Offloading Content with Self-Organizing Mobile Fogs", $29^{th}$ *International Teletraffic Congress, ITC29*, 2017.

8. **Junaid Ahmed Khan**, Yacine Ghamri-Doudane, "STRIVE: Socially-aware Three-tier Routing in Information-centric Vehicular Environment", *IEEE Globecom*, 2016.

9. **Junaid Ahmed Khan**, Yacine Ghamri-Doudane, Dmitri Botvich" InfoRank: Information-Centric Autonomous Identification of Popular Smart Vehicles", *IEEE VTC*, Fall 2015.

10. **Junaid Ahmed Khan**, Yacine Ghamri-Doudane, "CarRank: An Information-Centric Identification of Important Smart Vehicles for Urban Sensing", *IEEE NCA*, 2015.

11. **Junaid Ahmed Khan**, Yacine Ghamri-Doudane, Dmitri Botvich, "GRank - An Information-Centric Autonomous and Distributed Ranking of Popular Smart Vehicles", *IEEE Globecom*, 2015.

12. **Junaid Ahmed Khan**, Yacine Ghamri-Doudane, Ali El Masri, "Towards the Ranking of Important Smart Vehicles in VANETs - An Information-centric Approach", *IEEE CFIP NOTERE*, 2015.

13. **Junaid Ahmed Khan**, Hassaan Khaliq Qureshi, Adnan Iqbal."TRW: An Energy Storage Capacity Model for Energy Harvesting Sensors in Wireless Sensor Networks", *IEEE PIMRC*, 2014.

14. Rehan Qayyum, **Junaid Ahmed Khan**, Adnan Iqbal. "Improving Multipath Data Delivery and Energy Efficiency in Few Disjoint Paths Scenario.", *IFIP Wireless Days (WD)*, 2012.

Workshops

1. **Junaid Ahmed Khan**, Cedric Westphal, Yacine Ghamri-Doudane, "A Content-based Centrality Metric for Collaborative Caching in Information-Centric Fogs", *IFIP Networking- Information Centric Fog Computing (ICFC) Workshop*, 2017.

Posters

1. Ahmadreza Talebian, Sabya Mishra, Mike Golias, **Junaid Ahmed Khan**, Charles Santo, Lan Wang, Eddie Jacobs and Carmen Astorne-Figary, "A holistic index for evaluating readiness to accommodate connected autonomous vehicles", $98^{th}$ *TRB Meeting*, 2019.

**TALKS**

1. "CLF: Connectivity and Location-aware Forwarding for Connected and Autonomous Vehicles (CAVs)", *NDN Retreat,* UCLA, Los Angeles, CA, USA, 7-8 March 2019.

2. "CLRS: Connectivity and Location-aware Routing Scheme for Connected and Autonomous Vehicles (CAVs)", *NDNComm,* NIST, Washington D.C, USA, 19-20 September 2018.

3. "A Coalition Game for Collaborative Edge Caching at Fog Network of Connected Vehicles", $8^{th}$ *REVE*, Inria Paris, France, $22^{nd}$ March 2018.

4. "STRIVE: Socially-aware Three-tier Routing in Information-centric Vehicular Environment, $1^{st}$ *Smart City Day*, Inria Sophia Antipolis, France, 11 January 2017.

5. "SAVING: Socially Aware Vehicular Information-centric Networking" *Journées nonthématiques RESCOM*, Inria Sophia Antipolis, France, 12-13 January 2017.

6. "Autonomous Identification and Optimal Selection of Popular Smart Vehicles for Urban Sensing- An Information-centric Approach", $7^{th}$ REVE, UTC Compiegne, France, 10-11, March 2016.

7. "CarRank: An Information-Centric Distributed Ranking Algorithm for Popular Smart Vehicles", $6^{th}$ *REVE*, EURECOM Sophia Antipolis, France, 19-20, March 2015.

## TEACHING

**University of Memphis, Memphis, TN, USA (Spring 2018 - Present)**
Instructor: Computer Science Department
Course: COMP 3825 Networking and Information Assurance (Undergraduate)

**INSA Lyon, France (10/2016 - 12/2017)**
Instructor: Telecommunications Department
Courses: Advanced Computer Networks, Mobile Network Architecture,
Network (Socket) Programming, Telecoms Informatics Passport

**University of La Rochelle, La Rochelle, France (01/2016 - 08/2016)**
Graduate Teaching Assistant: Computer Science Department
Courses: Computer Networks, Network Security, Database Management

## AWARDS

IEEE Best Paper Award at the ICNC Conference 2018
NSF Smart and Connected Communities (S&CC) Aspiring PI Travel Grant 2018
Université Paris-Est - Researcher Mobility Grant 2016
IFIP Wireless Days Student Travel Grant 2012

## ADVISING

Ph.D.

Mr. Tianxing Ma, University of Memphis, TN, USA (2018)
Mr. Mazhar Hossain, University of Memphis, TN, USA (2018)
Mr. Muktadir Chowdhury, University of Memphis, TN, USA (2018)
Mr. Ali Marandi, University of Bern, Switzerland (2018)
Ms. Mariem Harmassi , University of La Rochelle, France (2017)
Ms. Manel Khaou, University of SFAX, Tunisia (2017)
Mr. Bouziane Brik, University of La Rochelle, France (2016)

Masters

Ms. Rim-el-Fahem, SUPCOM, Tunisia (2015)

Undergraduate

Mr. Jonathon Michael Wade, University of Memphis, TN, USA (2018)
Ms. Margaret Homeyer, University of Memphis, TN, USA (2018)
Mr. Thomas Pascarella Watson, University of Memphis, TN, USA (2018)

## SERVICES

Technical Program Committee

IEEE/IFIP Wireless Days Conference (WD) 2018, 2019
IEEE International Conference on Communications (ICC) 2018
IEEE International Smart Cities Conference (ISC2) 2017

Reviewer

IEEE Communications Magazine, IEEE Transactions on Vehicular Technology,
IEEE Transactions on Mobile Computing, IEEE Internet of Things Journal,
IEEE Transactions on Wireless Communications, IEEE Transactions on ITS,
Elsevier JNCA, Computer Communications, Journal of Computers of Electrical Engineering,
Annals of Telecommunications Journal, IEEE ICC'14-18, WCNC'14-18, Globecom'14-18, IM'15,
VTC Spring'14,15, VTC Fall'14,15, Milcom'14, LCN'14, SPECTS'14, ITC'14, IFIP WD'13-19.

Member

IEEE Communications Society (ComSoc), Vehicluar Technology Society (VTS)

## SKILLS/TOOLS

Programming: C/C++, Latex, Matlab, Octave, R, Javascript, Android,
Python: Numpy, Scipy, Matplotlib, NetworkX, Pandas, Sklearn, Caffe, NLTK, TensorFlow
Networking: NS-3, Omnet++, Wireshark, Packet Tracer, OPNET, GNS3
Embedded: VERILOG, PSPICE, Multisim, MICROWIND DSCH, MASM TinyOS (NesC)
Big data: PHP MySQL/ SQL, Hadoop, MapReduce, Apache Spark, MLlib, Torch

## REFRENCES


Yacine Ghamri-Doudane
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University of La Rochelle, France
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