

Dr. Jiazi YI

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Summary of Qualifications

- Experienced Internet Architect: protocol designer and network engineer
- International standardization participant: 4 years of IETF experience, 2 IETF/ITU standards, 9 internet drafts
- Experienced technical leader: leading project with industrial partners (Hitachi, Fujitsu, EDF, etc.), and supervised more than 10 master students.
- Experience in embedded system, smart home, wireless networks, sensor networks, smart grid
- Expert in network performance evaluation and simulation (NS2, Qualnet, GloMoSim, etc.)
- Experienced software engineer in Java, C/C++, Linux, Ruby, SQL development.
- Solid research background: more than 20 peer-reviewed publications in international journals/conferences.

Professional Experience

- 12/2010 — now Research Engineer, LIX, Ecole Polytechnique, France
 - Research in smart home, ad hoc networks, sensor networks, smart grid, network protocol
 - 2 international standards (in IETF, ITU-T), 20 international academic publications
 - Project leader, student supervision
 - Participation in industrial research projects, including companies Hitachi, Fujitsu, EDF.
 - Familiar with network simulation tools (NS2, Qualnet, etc), performance evaluation.
 - Experience in international standardization
- 07/2010 — now IETF (Internet Engineering Task Force) standard body participation.
 - Active contributor to MANET, ROLL, CORE working group
 - Currently 7 active internet drafts, 1 published RFC
- 02/2007 — 09/2007 Research Engineer IRCCyN UMR CNRS 6597, Polytech'Nantes, France
 - Research on multipath routing protocol for ad hoc networks

Education

- 11/2007—11/2010 PhD in Computer Science, University of Nantes, France
Subject of thesis: Multipath Routing Protocol for Mobile ad hoc Networks
- 09/2006—07/2007 M.Sc. in Electronic System, Ecole Polytechnique de l'Université de Nantes, France
- 09/2005—07/2006 M.Sc. in Computer Science, South China University of Technology, China
- 09/2001—07/2005 B.Eng in Computer Science, Central South University, China

Projects & Research Activities (selected)

- **Implementation and Evaluation of G3-PLC MAC Protocol (08/2014 -)**
In collaboration with EDF R&D, to study the performance of G3-PLC MAC protocol, especially the CSMA/CA algorithm in a simulation platform. The goal is to explore the capacity of G.9903 MAC protocol with different modulations (DBPSK, DQPSK, RUBOST), so as to optimize the network.
- **ADEME SoGrid (10/2012 -)**
Multi-stakeholder, national project (ST Micro, SAGEMCOM, Nexans, EDF, ..), funded by ADEME (Agence de l'Environnement et de la Maitrise de l'Energie, France), with the goal of developing a SoC (System-on-Chip) solution for Smart Grid communication. Specifically, my activities include:

- Routing protocol design, Network Optimization
 - Simulation and performance evaluation
 - Protocol implementation, interoperability test, and standardization
- **Routing Protocol for Smart Grid (On-going)**
Development of routing protocols, extensions, and architectures, for AMI (Advanced Metering Infrastructure), in collaboration with ERDF (French national grid), Hitachi and Maxim IC. This project is particular in that it is constructed as a set of bilaterally funded (each between only one industrial partner, and LIX) industrial collaborations, with LIX coordinating and concentrating the activities, both concerning research and standardization. Specifically, my activities include:
 - Design, implementation, evaluation (analyses and simulation), interoperability testing, of a routing protocol over low power and lossy networks.
 - Formal specification of protocol, for standardization (ITU-T G9903 amd1)
 - **Depth-first Forwarding in Unreliable Networks (2013-2014)**
In collaboration with Fujitsu Lab of America, to develop a data forwarding mechanism to increase the reliability of data delivery in networks with dynamic topology and lossy links. Specifically, my activities include:
Design and improvement of the depth-first forwarding algorithm.
 - Integration of the forwarding algorithm to routing protocols.
 - Performance evaluation and analyses.
 - **Security for Wireless, Ad-hoc and MESH networks (Ongoing)**
Security threat analysis of routing and multicast protocols, vulnerability studies and damage estimates. This project reflects an ongoing security audit and analysis of the protocols, which are produced in the MANET working group of the IETF, and has a purpose to
 - Identify and document attack vectors within the protocols,
 - Guide designing security mechanisms.
 This project has so far given rise to publication of numerous academic papers, and one RFC (RFC7186) within the IETF.
 - **SEReadMO (2006 - 2009)**
A French national project (IRCCyN-IVC, THALES Group, Keosys and University of Poitiers), supported by RNRT (National Network of Research in Telecommunications) and with the objective to develop a secure and reliable routing protocol for wireless ad hoc networks. Specifically, my activities included:
 - Theory study, design, implementation (Qualnet, ns2) of the main project deliverable: a multipath routing protocol;
 - Implementation of forward error correction coding in simulator;
 - Performance analysis and evaluation;
 - Testbed setup and experiments.
 - **SVCEval (2009-2010)**
Development of a flexible evaluation framework, based on the JSVM reference software, for simulating (Qualnet) H.264/SVC video transmission across networks. It is based on JSVM reference software and Qualnet simulator.

IETF RFC and Internet Draft

- **RFC 7186 : Security Threats for NHDP**
J. Yi, U. Herberg, T. Clausen
<http://tools.ietf.org/html/rfc7186>
- **The LLN On-demand Ad hoc Distance-vector Routing Protocol - Next Generation (LOADng)**
ITU G.9903 Narrow-band orthogonal frequency division multiplexing power line communication transceivers for G3-PLC networks: Amendment 1
T. Clausen, A. Colin de Verdiere, J. Yi, A. Niktash, Y. Igarashi, H. Satoh, U. Herberg, C. Lavenu, T. Lys
<http://tools.ietf.org/html/draft-clausen-lln-loadng>

- **Multi-path Extension for the Optimized Link State Routing Protocol version 2 (OLSRv2)**
J. Yi, B. Parrein
<https://tools.ietf.org/html/draft-ietf-manet-olsrv2-multipath>
- **Experience with the LOADng routing protocol for LLNs**
T. Clausen, A. Camacho, J. Yi, A. Colin de Verdiere, Y. Igarashi, SATOH. H. Y. Morii
<http://tools.ietf.org/html/draft-lavenu-lln-loadng-interoperability-report>
- **Observations of RPL: IPv6 Routing Protocol for Low power and Lossy Networks**
T. Clausen, A. Colin de verdiere, J. Yi, U. Herberg, Y. Igarashi.
<http://tools.ietf.org/html/draft-clausen-lln-rpl-experiences>
- **Smart Route Request for Lightweight On-demand Ad hoc Distance-vector Routing - Next Generation**
J. Yi, T. Clausen
<http://tools.ietf.org/html/draft-yi-loadngsmartreq>
- **Collection Tree Protocol for Lightweight On-demand Ad hoc Distance-vector Routing - Next Generation (LOADng-CT)**
J. Yi, T. Clausen
<http://tools.ietf.org/html/draft-yi-loadngct>
- **Jitter Consideration for Reactive Protocol in Mobile Ad Hoc Networks (MANETs)**
J. Yi, J. Fuertes, T. Clausen,
<http://tools.ietf.org/html/draft-yi-manet-reactive-jitter>

Teaching

- 02/2012 — Teaching assistant at Ecole Polytechnique, France
INF 311 (BAC+3), Introduction à l'informatique (2012-2013)
INF 567 (BAC+5), Mobile Networks (2013)
INF 441 (BAC+4), Experimental Project in Computer Science – Networking (2014)
INF 557 (BAC+5), Introduction to Networks (2013-2014)
- 10/2008 — 02/2010 Teacher at University of Nantes, France
Master course Network System and Protocols (BAC+5)

Student Supervision

- **Masters Thesis:**
 - 02/2011 - 09/2011 Alberto Camacho, Ecole Polytechnique, "Implementation and testing of LOADng: a routing protocol for WSN" (co-advised with T. Clausen)
 - 02/2011 - 07/2011 Mingzhi Jian, Ecole Polytechnique, "Java implementation of MP-OLSR" (co-advised with T. Clausen)
 - 02/2010 - 07/2010 Wissam Hamdach, Polytech'Nantes, "QoS of Multipath Routing over ad hoc Networks" (co-advised with Benoit Parrein)
 - 02/2009 — 07/2009 Yipeng Lao, master student of Polytech'Nantes "A Comparison Study of NS2 and Qualnet Simulator" (co-advised with Benoit Parrein)
- **Internship Students**
 - 09/2014 – now Rita Ibrahim, "Evaluation of HomeNet Control Protocol" (co-advised with M. Townsley)
 - 09/2013 - 03/2014 Lucas Merlette, "LOADng optimization", intern from Epitech, France
 - 09/2013 - 12/2013 Guillaume Pages and Laurent Anadon, Ecole Polytechnique, "Depth-first extension for OLSR protocol"
 - 02/2012 - 08/2012 Antonin Bas, Ecole Polytechnique, "Local repair mechanism for LOADng" (co-advised with T. Clausen)
 - 07/2010 - 12/2010 Victor Héry and Thibaud Perret, Polytech'Nantes, "A Comparison Study of Two Multi-path Forwarding Mechanisms" (co-advised with Benoit Parrein)

- 09/2009 - 01/2010 Dobromir Manchev and Lucile Seyres, Polytech'Nantes, "An Evaluation Framework for Network Simulation of H.264/AVC Video Transmission" (co-advised with Benoit Parrein)

Publications

International Journals

- **Multipath Optimized Link State Routing for Mobile ad hoc Networks**
Elsevier Ad Hoc Networks Journal (2011), Volume 9, Issue 1,28-47, Jan. 2011.
Jiazi Yi, Asmaa Adnanea, Sylvain Davida and Benoit Parrein
- **Collection Tree Extension of Reactive Routing Protocol for Low-Power and Lossy Networks**
International Journal of Distributed Sensor Networks Volume 2014 (2014)
Jiazi Yi, Thomas Clausen
- **An Adaptive Jitter Mechanism for Reactive Route Discovery in Sensor Networks**
Sensors, 2014 Aug 8;14(8):14440-71
Juan Antonio Cordero, Jiazi Yi, Thomas Clausen
- **Depth First Forwarding for Unreliable Networks: Extensions and Applications**
IEEE Internet of Things Journal (accepted)
Jiazi Yi, Thomas Clausen, Ulrich Herberg

International Peer-reviewed Conferences

- **Path Accumulation Extensions for the LOADng Routing Protocol in Sensor Networks**
Lecture Notes in Computer Science, Volume 8662-2014, Internet of Vehicles – Technologies and Services, 150-159
Thomas Clausen, Jiazi Yi
- **Depth First Forwarding for Low Power and Lossy Networks: Application and Extension**
IEEE World Forum on Internet of Things WF-IoT 2014
Jiazi Yi, Thomas Clausen, Ulrich Herberg
- **Evaluation of Routing Protocol for Low Power and Lossy Networks: LOADng and RPL**
The 2013 IEEE Conference on Wireless Sensors
Jiazi Yi, Thomas Clausen and Yuichi Igarashi
- **Performance analysis of Trickle as a flooding mechanism**
The 5th IEEE International Conference on Communication Technology (ICCT2013)
Thomas Clausen, Axel Colin de Verdierre, Jiazi Yi
- **A Depth First Forwarding (DFF) Extension for the LOADng Routing Protocol**
Sixth International Workshop on Autonomous Self-Organizing Networks
Thomas Clausen, Jiazi Yi, Antonin Bas, Ulrich Herberg
- **Jitter Considerations in On-demand Route Discovery for Mobile Ad Hoc Networks**
IEEE WiOpt 2013: 11th Intl. Symposium on Modeling and Optimization in Mobile, Ad Hoc, and Wireless Networks
Jiazi Yi, Juan Antonio Cordero, Thomas Clausen
- **Optimization of Jitter Configuration for Reactive Route Discovery in Wireless Mesh Networks**
The 16th International Conference on Network-Based Information Systems (NBIS-2013)
Juan Antonio Cordero, Jiazi Yi, Thomas Clausen
- **Smart Route Request for On-demand Route Discovery in Constrained Environments**
IEEE ICWITS 2012, IEEE International Conference on Wireless Information Technology and Systems
Jiazi Yi, Thomas Clausen, Antonin Bas
- **Expanding Ring Search for Route Discovery in LOADng Routing Protocol**
The 1st International Workshop on Smart Technologies for Energy, Information and Communication

Antonin Bas, Jiazi Yi, Thomas Clausen

- **Vulnerability Analysis of Relay Set Selection Algorithms for the Simplified Multicast Forwarding (SMF) Protocol for Mobile Ad Hoc Networks**
The 15th International Conference on Network-Based Information Systems (NBIS-2012)
Jiazi Yi, Thomas Clausen
- **Efficient Data Acquisition in Sensor Networks: Introducing (the) LOADng Collection Tree Protocol**
IEEE WiCom 2012, The 8th IEEE International Conference on Wireless Communications, Networking and Mobile Computing.
Jiazi Yi, Thomas Clausen, Axel Colin de Verdiere
- **Towards AODV Version 2**
IEEE VTC 2012 Fall, IEEE 76th Vehicular Technology Conference
Thomas Clausen, Jiazi Yi, Axel Colin de Verdiere
- **QoE enhancement for H.264/SVC video transmission in MANET using MP-OLSR protocol**
ISIVC 2012, The 6th International Symposium on signal, Image, Video and Communications
Dan Radu, Jiazi Yi, Benoit Parrein
- **Acoustic noise pollution monitoring in an urban environment using a VANET network**
IEEE International Conference on Automation, Quality and Testing, Robotics 2012
Dan Radu, Benoit Parrein, Jiazi Yi
- **Vulnerability Analysis of the Simple Multicast Forwarding (SMF) Protocol for Mobile Ad Hoc Networks**
IEEE CPSCom 2011, The IEEE International Conference on Cyber, Physical, and Social Computing.
Jiazi Yi, Thomas Clausen, Ulrich Herberg
- **Multipath Routing Protocol for MANET: Application to H.264/SVC Video Content Delivery**
IEEE WPMC 2011, The 14th International Symposium on Wireless Personal Multimedia Communications
Jiazi Yi, Benoît Parrein and Dan Radu
- **Performance Analysis of SNMP in OLSRv2-routed MANETs**
IEEE CNSM 2011, The 7th International Conference on Network and Service Management
Ulrich Herberg, Robert G. Cole, Jiazi Yi
- **SEREADMO : protocole de routage sécurisé pour réseaux ad hoc mobiles**
Colloque Francophone sur l'Ingénierie des Protocoles 2009, Strasbourg : France (2009)
Benoît Parrein, Jiazi Yi
- **Multipath OLSR: Simulation and Testbed**
5th OLSR Interop/Workshop, Vienna : Austria (2009)
Jiazi Yi, Sylvain David, Hassiba Asmaa Adnane, Benoît Parrein, Xavier Lecourtier
- **Simulation and Performance Analysis of MP-OLSR for Mobile Ad hoc Networks**
4th OLSR Interop/Work Shop, Ottawa : Canada (2008)
Jiazi Yi, Eddy Cizeron, Salima Hamma, Benoît Parrein, Pascal Lesage
- **Implementation of Multipath and Multiple Description Coding in OLSR**
IEEE WCNC 2008, Las Vegas : USA (2008)
Jiazi Yi, Eddy Cizeron, Salima Hamma, Benoît Parrein