

CURRICULUM VITAE
SANDRA LORENA CÉSPEDES UMAÑA

Department of Electrical Engineering

Universidad de Chile

E-mail scespedes@ing.uchile.cl

Phone: +56 (2) 29784093

<http://www.cec.uchile.cl/~scespedes>

I. EDUCATION

Ph.D. in Electrical and Computer Engineering (2012). Broadband Communications Research Group. University of Waterloo. Waterloo, Canada.

Thesis: IP Mobility Support in Multi-hop Vehicular Communications Networks.

Specialization Degree in Management of Information Systems (2007). Universidad Icesi. Cali, Colombia.

Bachelor's Degree in Telematics Engineering (2003) [Magna Cum Laude]. Universidad Icesi. Cali, Colombia.

II. PROFESSIONAL APPOINTMENTS

1. **Assistant Professor (October 2014 - Present).** Department of Electrical Engineering. Faculty of Physical and Mathematical Sciences. Universidad de Chile, Santiago, Chile.
2. **Assistant Professor (2012 - 2014).** Department of Information and Communications Technology. Faculty of Engineering. Universidad Icesi, Cali, Colombia.
3. **Telematics Engineering Program Director (2013 - 2014).** Faculty of Engineering. Universidad Icesi, Cali, Colombia.
4. **Full time course instructor (2005 - 2008).** Department of Information and Communications Technology. Faculty of Engineering. Universidad Icesi, Cali, Colombia.
5. **Infrastructure manager (2003 - 2005).** Technical Department. People on Line S.A. Cali, Colombia.

III. PUBLICATIONS

Refereed Journals Articles

1. C. Estévez, C. Azurdia, **S. Céspedes**. "Overcoming Intrinsic Losses With a Physical-Transport Cross-Layer Control System for Low-SNR Links", in *IEEE Communications Letters*, vol.19, no.12, pp.2094-2097, Dec 2015.
DOI: [10.1109/LCOMM.2015.2490672](https://doi.org/10.1109/LCOMM.2015.2490672)
2. **S. Céspedes**, X. (Sherman) Shen. "On Achieving Seamless IP Communications in Heterogeneous Vehicular Networks", in *IEEE Transactions on Intelligent Transportation Systems*, vol.16, no.6, pp.3223-3237, Dec 2015.
DOI: [10.1109/TITS.2015.2442251](https://doi.org/10.1109/TITS.2015.2442251)
3. Orozco, **S. Céspedes**, R. Michoud, G. Llano. "Design and Simulation of a Collision Notification Application with Geocast Routing for Car-to-Car Communications", in *European Transport Research Review*, vol.7 (4), p.36, Oct 2015.
DOI: [10.1007/s12544-015-0185-1](https://doi.org/10.1007/s12544-015-0185-1)
4. D. F. Ramírez, **S. Céspedes**, "Routing in Neighborhood Area Networks: A Survey in the Context of AMI Communications", *Journal of Network and Computer Applications*, vol.55, pp.68-80, September 2015.
DOI: [doi:10.1016/j.jnca.2015.04.011](https://doi.org/10.1016/j.jnca.2015.04.011)
5. **S. Céspedes**, S. Taha, X. (Sherman) Shen. "A Multi-hop Authenticated Proxy Mobile IP Scheme for Asymmetric VANET", *IEEE Transactions on Vehicular Technology*, vol.62, no.7, pp.3271-3286. September 2013.
[DOI:10.1109/TVT.2013.2252931](https://doi.org/10.1109/TVT.2013.2252931)
6. **S. Céspedes**, N. Lu, X. (Sherman) Shen. "VIP-WAVE: On the Feasibility of IP Communications in 802.11p Vehicular Networks", *IEEE Transactions on Intelligent Transport Systems*, vol.14, no.1, pp.82-97, March 2013.
[DOI: 10.1109/TITS.2012.2206387](https://doi.org/10.1109/TITS.2012.2206387)
7. **S. Céspedes**, X. (Sherman) Shen, C. Lazo. "IP Mobility Management for Vehicular Communication Networks: Challenges and Solutions", *IEEE Communications Magazine* - [Topics in automotive networking], vol.49, no.5, pp.187-194, May 2011.
DOI: [10.1109/MCOM.2011.5762817](https://doi.org/10.1109/MCOM.2011.5762817)

Book Chapters

1. C. Estévez, C. Azurdia, **S. Céspedes**, "The Internet of Interlaced Cyber-physical Things", in book *Cyber Physical Systems: From Theory to Practice*. Auerbach Publications, CRC Press, Taylor & Francis Group, USA. Accepted for publication, 2015.
2. S. Taha, **S. Céspedes**, X. (Sherman) Shen. "Mutual Authentication in IP Mobility-enabled Multihop Wireless Networks" in book *Security for Multihop Wireless Networks*. Auerbach Publications, CRC Press, Taylor & Francis Group, USA. Pages 101-124. 2014.
3. **S. Céspedes** and Z. Solarte. "Design and development of the monitor component" in book *Universal system for portability on mobile devices between heterogeneous wireless networks* [In Spanish]. Universidad Autónoma de Colombia. Pages 95-123. 2008
4. C. Lazo, R. Glocker, **S. Céspedes** and M. Veiga. "Traffic Flow Analysis Over an IPv6 Hybrid MANET" in book *Innovative Algorithms and Techniques in Automation, Industrial, Electronics and Telecommunications v2*. Springer Netherlands. Pages 95-100. 2007

Standards

1. U. Herberg, A. Cardenas, T. Iwao., M. Dow, **S. Céspedes**, "Depth-First Forwarding in Unreliable Networks", *IETF RFC 6971*. June 2013

Peer-review Conference Proceedings

1. **S. Céspedes**, J. Salamanca, A. Yañez, C. Rivera., J. Sacanamboy. "Platoon-based Cyclists Cooperative System", in *Proc. IEEE Vehicular Networking Conference (VNC) 2015*, Kyoto, Japan, Jan 2016. DOI:[10.1109/VNC.2015.7385556](https://doi.org/10.1109/VNC.2015.7385556)
2. C. Estévez, **S. Céspedes**, "Improving Performance of TCP-Based Applications in Power Line Communications for Smart Grids", in *Proc. IEEE Latin-American Conference on Communications (LATINCOM) 2015*, Arequipa, Peru, Nov 2015. DOI: [10.1109/LATINCOM.2015.7430132](https://doi.org/10.1109/LATINCOM.2015.7430132)
3. A. Falchetti, C. Azurdia, **S. Céspedes**, "Vehicular Cloud Computing in the Dawn of 5G", in *2015 CHILEAN Conference on Electrical, Electronics Engineering, Information and Communication Technologies (CHILECON)*, Santiago, Chile, Oct 2015. DOI: [10.1109/Chilecon.2015.7400392](https://doi.org/10.1109/Chilecon.2015.7400392)
4. D.F. Ramírez, **S. Céspedes**, "Performance Evaluation of Future AMI Applications in Smart Grid Neighborhood Area Networks", *IEEE Colombian Conference on Communications and Computing (COLCOM) 2015*, Popayán, Colombia, May 2015. DOI: [10.1109/ColComCon.2015.7152093](https://doi.org/10.1109/ColComCon.2015.7152093)
5. C. Lazo, P. Gallardo, **S. Céspedes**, "A Bridge Structural Health Monitoring System Supported by the Internet of Things", *IEEE Colombian Conference on Communications and Computing (COLCOM) 2015*, Popayán, Colombia, May 2015. DOI: [10.1109/ColComCon.2015.7152094](https://doi.org/10.1109/ColComCon.2015.7152094)
6. **S. Céspedes**, J. Salamanca, J. C. Sacanamboy, C. Rivera., "Poster: Smart networked bicycles with platoon cooperation," 2014 IEEE Vehicular Networking Conference (VNC). Paderborn, Germany. Dec 2014. DOI: [10.1109/VNC.2014.7013346](https://doi.org/10.1109/VNC.2014.7013346)
7. G. Ulloa, N. Villegas, **S. Céspedes**, M. Ayala, A. Ramírez. "An Approach to the Implementation Process of CDIO", in *10th International CDIO conference 2014*, Barcelona, Spain, Jan 2014.
8. P. Ernest, H. A. Chan, O. E. Falowo, L. A. Magagula, L. A., **S. Céspedes**. Network-based Distributed Mobility Management for Network Mobility, in *Proc. IEEE Consumer Communications and Networking Conference (CCNC) 2014*, Las Vegas, USA, Jan 2014. DOI: [10.1109/CCNC.2014.6866604](https://doi.org/10.1109/CCNC.2014.6866604)
9. N. Alsharif, **S. Céspedes**, X. (Sherman) Shen. "iCAR: Intersection-based Connectivity Aware Routing in Vehicular Ad hoc Networks". in *Proc. IEEE International Conference on Communications (ICC) 2013*, Budapest, Hungary. Jun 2013. DOI: [10.1109/ICC.2013.6654769](https://doi.org/10.1109/ICC.2013.6654769)
10. **S. Céspedes**, X. (Sherman) Shen. "Enabling relay-aided IP Communications in 802.11p/WAVE Networks", in *Proc. IEEE Global Telecommunications Conference (GLOBECOM) 2012*, Anaheim, USA. Dec 2012. DOI: [10.1109/GLOCOM.2012.6504007](https://doi.org/10.1109/GLOCOM.2012.6504007)
11. S. Taha, **S. Céspedes**, X. (Sherman) Shen. "EM3A: Efficient Mutual Multi-hop Mobile Authentication Scheme for PMIP Networks", in *Proc. IEEE International Conference on Communications (ICC) 2012*, Ottawa, Canada. Jun 2012. DOI: [10.1109/ICC.2012.6363975](https://doi.org/10.1109/ICC.2012.6363975)
12. D. Ramirez, **S. Céspedes**. "Evaluation of Mesh-under and Route-over Routing Strategies in AMI systems", in *Proc. IEEE Colombian Conference on Communications and Computing (COLCOM) 2012*. Cali, Colombia. May 2012. DOI: [10.1109/ColComCon.2012.6233670](https://doi.org/10.1109/ColComCon.2012.6233670)
13. **S. Céspedes**, A. Cárdenas, T. Iwao., "Comparison of Data Forwarding Mechanisms for AMI Networks", in *Proc. 2012 IEEE PES Innovative Smart Grid Technologies Conference (ISGT)*. Washington, USA. Jan 2012. DOI: [10.1109/ISGT.2012.6175683](https://doi.org/10.1109/ISGT.2012.6175683)

14. **S. Céspedes**, X. (Sherman) Shen. "A Framework for Ubiquitous IP Communications in Vehicle to Grid Networks", in Proc. *IEEE Global Telecommunications Conference (GLOBECOM Wkshps) 2011 - UbiCoNet*. Houston, USA. Dec 2011. DOI: [10.1109/GLOCOMW.2011.6162378](https://doi.org/10.1109/GLOCOMW.2011.6162378)
15. M. Asefi, **S. Céspedes**, X. (Sherman) Shen., J. Mark. "A Seamless Quality-Driven Multi-Hop Data Delivery Scheme for Video Streaming in Urban VANET Scenarios", in Proc. *IEEE International Conference on Communications (ICC) 2011*. Kyoto, Japan. Jun 2011. DOI: [10.1109/icc.2011.5962785](https://doi.org/10.1109/icc.2011.5962785)
16. **S. Céspedes** U., X. (Sherman) Shen. "An Efficient Hybrid HIP-PMIPv6 Scheme for Seamless Internet Access in Urban Vehicular Scenarios", in Proc. *IEEE Global Telecommunications Conference (GLOBECOM) 2010*. Miami, USA. Dec 2010. DOI: [10.1109/GLOCOM.2010.5684018](https://doi.org/10.1109/GLOCOM.2010.5684018)
17. C. Lazo, **S. Céspedes**, M. Veiga. "QoS and multipath routing in vehicular networks", in Proc. *Euro American Conference on Telematics and Information Systems (EATIS)*. Faro, Portugal. 2007.

IV. RESEARCH GRANTS AND FELLOWSHIPS

1. **Project:** "Community Mesh-networking for Ukamau's Social Movement". Coordinator. Sponsored by Internet Society, Chapter Small Projects Funding. 2016.
2. **Project:** "VNET- Towards End-to-End Network Cloudification". Researcher. Sponsored by CONICYT Chile, Project STIC AMSUD N° 16-STIC-11. 2016-2017.
3. **Project:** "Exploiting network diversity for improved performance of traffic efficiency applications in urban vehicular networks". Principal Investigator. Sponsored by CONICYT Chile, Project FONDECYT Iniciación N° 11140045. 2014 – 2017.
4. **Project:** "Efficient Data Dissemination in Heterogeneous Vehicular Communication Networks". Principal Investigator. Sponsored by U-INICIA, Universidad de Chile, Project N° UINICIA-2014-005. 2014 -2016
5. **Project:** "Mediators' design and evaluation for networked agent's behavior". Researcher. Sponsored by Icesi University. 2013-Present.
6. **Project:** "Evaluation of topologies and routing mechanisms in AMI networks for smart grid communications in rural and urban environments in Colombia". Principal Investigator. Sponsored by Icesi University. 2013-2014.
7. **Project:** "Universal system for portability on mobile devices between heterogeneous wireless networks". Mobile Computing Research Consortium - i2ComM. Researcher. Sponsored by Colciencias. 2006-2008
8. **Fellowship:** Returning ISOC Fellow to the IETF meeting (2015 - Prague, 2013 - Berlin, 2012 - Paris, 2010 - Beijing, 2009 - Hiroshima, 2007 - Chicago), Sponsored by the Internet Society (ISOC).
9. **Fellowship:** Fellowship to the LACNIC VIII meeting (2005 - Lima), Sponsored by the Latin American and Caribbean Internet Addresses Registry (LACNIC).

V. AWARDS AND HONORS

1. Best Poster Award. "Smart Networked Bicycles with Platoon Cooperation". *2014 IEEE Vehicular Networking Conference*. (2014), Paderborn, Germany.
2. Ontario Research and Development Challenge Fund Bell Scholarship (2012, 2011), University of Waterloo, Canada.
3. University of Waterloo Graduate Scholarship (2010), University of Waterloo, Canada.
4. Colfuturo Scholarship for Graduate Studies (2008), Colfuturo, Colombia.
5. Magna Cum Laude (2003), Universidad Icesi, Colombia.

VI. INVITED TALKS

2015

1. Osaka Prefecture University, Graduate School of Engineering, "Exploiting Network Diversity in Heterogeneous Vehicular Networks", Osaka, Japan.
2. Spring School of Networks, "Internet Engineering Task Force (IETF)", Invited Speaker, Santiago, Chile.
3. Spring School of Networks, "Vehicular Communication Networks", Keynote Speaker, Santiago, Chile.
4. IEEE Colombian Conference on Communications and Computing (COLCOM), "Challenges of Internet-connected Cyber-Physical Systems", Keynote Speaker, Popayán, Colombia.

2014

1. 2014 CDIO Worldwide CDIO Fall Meeting, "Redesign of Telematics Engineering and Computing Systems Engineering programs with CDIO – an implementation perspective," Invited talk. Universidad de Chile, Santiago, Chile.

2013

1. 1º Jornada de I+D+I Facultad de Ciencias de la Ingeniería, "Depth First Forwarding in Unreliable Networks," Universidad Austral de Chile, Valdivia, Chile.
2. 1º Jornada de I+D+I Facultad de Ciencias de la Ingeniería, "Smart Grid Communications," Universidad Austral de Chile, Valdivia, Chile.
3. 1º Jornada de I+D+I Facultad de Ciencias de la Ingeniería, "I+D+I en la Facultad de Ingeniería de la Universidad Icesi," Universidad Austral de Chile, Valdivia, Chile.
4. VI Seminario Nacional de Tecnologías Emergentes en Telecomunicaciones, "Protocolos de Internet: ¿En qué va la estandarización en la IETF?," Keynote Speaker. Universidad del Cauca, Popayán, Colombia.
5. IEEE Colombian Conference on Communications and Computing (COLCOM), "Enabling Vehicular Communications: A Walk-through the Vehicular Network communications technologies and standards", Invited tutorial. Universidad Pontificia Bolivariana, Medellín, Colombia.
6. Jornada Telemática: Computación ubicua, una forma de estar en contacto, "Movilidad IP en redes de comunicación vehiculares multiasalto,," Keynote Speaker. Universidad Distrital Francisco José de Caldas, Bogotá, Colombia.

2012

1. Seminario de Investigación en Ingeniería, "IP Mobility Support in Multi-hop Vehicular Communications Networks", Universidad Icesi, Cali, Colombia.
2. Ph.D. Seminars, "IP Mobility Management in Vehicular Communications Networks", University of Waterloo, Waterloo, Canada.

2011

1. MOBOPTS Working group, "Mobility Management, Privacy, and other Issues in Vehicular Networking@, 81st Internet Engineering Task Force (IETF) Meeting, Quebec, Canada.
2. Departamento de Tecnologías de Información y Comunicaciones, "Movilidad en redes IP: Una visión desde el proceso de estandarización en la IETF y su aplicación en redes vehiculares", Universidad Icesi, Cali, Colombia.

VII. TEACHING EXPERIENCE

Universidad de Chile, Santiago, Chile. Course Instructor.

Undergraduate courses:

- Information and Communications Technologies (2015-1, 2014-2)
- Laboratory of Information and Communications Technologies (2016-1, 2015-2)

Graduate courses:

- Advanced concepts in Wireless Networking (2016-1, 2015-2)

Universidad Icesi, Cali, Colombia. Course Instructor.

Undergraduate courses:

- Computer Networks and Laboratory I (2013-1, 2013-2)
- Telematics Graduation Project I (2013-1, 2013-2)
- Communications Networks Laboratory II (2006-2, 2007-1, 2007-2, 2008-1)
- Network programming [Java-Processing] (2008-1)
- Algorithms and programming languages I [Java] (2006-1)
- Algorithms and programming languages II [Java] (2006-2)
- Algorithms and programming languages III [Java] (2007-1)
- Algorithms for telematics [C#.Net] (2006-1)
- Data structures and algorithms [C#.Net] (2007-1, 2007-2, 2008-1)

Graduate courses:

- Introduction to modelling and simulation with application to wireless digital transmission systems (2013-2) – Master in Informatics and Telecommunications.
- Network infrastructure services laboratory (2003) – Postgraduate Diploma in Network Services.

University of Waterloo, Waterloo, Canada. Teaching Assistant.

Undergraduate courses assisted in Electrical and Computer Engineering:

- Computer networks and security [4th year] (Winter 2009)
- Introduction to Programming [1st year] (Fall 2009, Fall 2010)

VIII. RESEARCH EXPERIENCE

Researcher (2014 – Present). Universidad de Chile, Santiago, Chile. Department of Electrical Engineering.

- Conducting research in Heterogeneous Vehicular Networks, Smart grid communications, IPv6 integration and the Internet of Things.
- Supervision of Graduate and Undergraduate students' theses.

Researcher (2005 – 2014). Icesi University, Cali, Colombia. Informatics and Telecommunications (i2t) Research group.

- Conducting research in routing, IP mobility, VANET, and Smart grid communications. Supervision of Master and Undergraduate students' theses.

Research Assistant (2009 – 2012). University of Waterloo. Waterloo, Canada. Broadband Communications Research Group (BBCR).

- Conducting research on IP mobility management, vehicular communication networks, and related topics.

Research intern (Winter 2011). Fujitsu Laboratories of America. Sunnyvale, CA, USA. Trusted systems innovation group (TSIG).

- Conducting research on routing for the Smart Grid (AMI networks). Simulations in OMNeT++.

Researcher (2006-2008). Mobile Computing Research Consortium - i2ComM. Cali, Colombia.

- Conducting research for the project "Universal system for portability on mobile devices between heterogeneous wireless networks".
- Organizer of i2ComM 2006 (Cali, Colombia) and i2ComM 2008 (Cartagena, Colombia) Academic Conferences.

IX. SERVICE TO PROFESSION

Associate Editor. IET Communications, March 2015-Present.

Coordinator. IEEE Women in Engineering affinity group, Chilean section, July 2015 – Present.

Journal Manuscript Reviewer. IEEE Communications Magazine, IEEE Communications Letters, IEEE Journal on Selected Areas of Communications, IEEE Transactions on Mobile Computing, IEEE Transactions on Vehicular Technology, IEEE Transactions on Intelligent Transportation Systems, IEEE Transactions on Smart Grid, IEEE Transactions on Wireless Communications, Ad Hoc Networks, Wireless Networks, Computer Communications, among others.

Technical Program Committee. Chair: International Conference on Computing, Networking and Communications (ICNC 2016) Workshops co-chair, Spring School on Networks (SSN 2015, 2016), IEEE GLOBECOM 2016 Publicity Vice-chair Latin America. **Member:** LANCOMM Workshop - in ACM SIGCOMM 2016, IEEE Vehicular Networking Conference (VNC) 2015, ACM Cyber-Physical Systems Security and PrivaCy Workshop (CPS-SPC) 2015, IEEE Vehicular Technology Conference (VTC) Fall 2013-2015, IEEE Int'l Conf. on Communications (ICC) 2014-2016, IEEE Global Communications Conference (GLOBECOM) 2011-2016, IEEE Colombian Conference on Communications and Computing (COLCOM) 2013-2015, IEEE CHILEAN Conference on Electrical, Electronics Engineering, Information and Communication Technologies (CHILECON) (CHILECON) 2015.

X. OTHER INFORMATION

Languages

- Spanish: Native.
- English: Proficient. Oral and written.

Professional affiliations

- IEEE Member (2012), IEEE Student Member (2009)
- IEEE Communications Society (2012)

Computer Skills and Certifications

- Computer programming: C++, Java, C#
- Simulation's software: OMNeT++
- International Teaching Assistant ITA Training. Centre for Teaching Excellence. University of Waterloo. 2009.
- Next Generation Leaders eLearning Course-Shaping the Internet: History and Future. NGL Programme. Internet Society. 2011.
- ExpectATions TA training workshop. ECE Department. University of Waterloo. 2009.
- Cisco Certified Network Associate CCNA. CISCO Network Academy. 2005.

Service

- Directorate member and IEEE WiE Coordinator. IEEE Chilean Section. 2015 – Present.
- External Advisory Committee Member. Telematics Engineering - Universidad Icesi (Colombia). 2015- Present.
- Volunteer. Women in Engineering Committee (2010). University of Waterloo.
- Global Representative of Colombia (2009 - 2012). International Students Office. University of Waterloo.
- Coordinator of the Microsoft's Academic Cell (2006- 2008). Universidad Icesi.
- Alumni Representative (2005) - Accreditation of Quality Committee. Telematics Engineering – Universidad Icesi (Colombia).