

# Carlos Teodoro Monsalve Arteaga

Escuela Superior Politécnica del Litoral  
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## CURRENT POSITION

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<b>Vicerector for Research and Innovation</b> <i>Escuela Superior Politécnica del Litoral</i>	Since November 2022
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## EDUCATION

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<b>Ph.D. Candidate, Software Engineering</b> <i>École de technologie supérieure, Montréal – Canada</i> Emphasis: business process modeling	2012
<b>Graduate Certificate in Innovation, Capital and Technology</b> <i>IC2 Institute of University of Texas at Austin in cooperation with Escuela de Postgrado en Administración de Empresas (ESPAE – ESPOL)</i>	2002
<b>Master of Science in Electrical Engineering</b> <i>Purdue University</i> Major in Digital communications	1995
<b>Graduate Studies in Business Administration</b> <i>Escuela de Postgrado en Administración de Empresas (ESPAE) - ESPOL</i>	1991
<b>Bachelor of Science in Computer Engineering</b> <i>Escuela Superior Politécnica del Litoral (ESPOL)</i>	1990

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## PUBLICATIONS

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Espinal, Albert, et al. "MEDICIMODELAMIENTO DEL RETARDO UNIDIRECCIONAL EN UN ENLACE PUNTO A PUNTO." *Investigación Operacional* 44.3 (2023): 395-406.

Espinal, Albert, Rebeca Estrada, and Carlos Monsalve. "Análisis comparativo y modelamiento del tráfico IP en una red de campus heterogénea." *Investigación Operacional* 41 (2020): 494-504.

Ramírez, M. Olivia García, Miguel De-la-Torre, and Carlos Monsalve. "Methodologies for the design of application frameworks: systematic review." 2019 8th International Conference On Software Process Improvement (CIMPS). IEEE, 2019.

Espinal, Albert, Rebeca Estrada, and Carlos Monsalve. "Traffic analysis of internet applications on mobile devices over LTE and wireless networks." *Revista Ibérica de Sistemas e Tecnologias de Informação* E22 (2019): 81-94.

Espinal, Albert, Rebeca Estrada, and Carlos Monsalve. "Modelling TCP/IP traffic of a convergent campus wireless network." *International Journal of Circuits, Systems and Signal Processing* 13 (2019): 611-616.

Espinal, Albert, Rebeca Estrada, and Carlos Monsalve. "Traffic model using a novel sniffer that ensures the user data privacy." *MATEC Web of Conferences*. Vol. 292. EDP Sciences, 2019.

Morales, L. E. M., Monsalve, C., & Villavicencio, M, "Formal verification of business processes as timed automata", In 2017 12th Iberian Conference on Information Systems and Technologies (CISTI) (pp. 1-6), IEEE, Junio 2017

Luis Eduardo Mendoza, Carlos Monsalve, Mónica Villavicencio, "Application of Formal Methods to Verify Business Processes". In: Ribeiro L., Lecomte T. (eds) *Formal Methods: Foundations and Applications*. SBMF 2016. Lecture Notes in Computer Science, vol 10090. Springer, Cham/Alex, 2016.

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Armijos, Carlos Monsalve, Rubén Ullón, Ricardo Maya, José Romero, "Calidad en la inspección de requerimientos de software: una propuesta de medición", CIBSE 2016 – Congreso Iberoamericano en Ingeniería de Software, Quito, Abril 27-29 2015.

Carlos Monsalve, Rubén Ullón, Ricardo Maya, José Romero, "Estudio del tamaño de los documentos de requerimientos de software como factor para la estimación del esfuerzo de inspección de requerimientos de software", JIISIC 2015 - XI Jornadas Iberoamericanas de Ingeniería de Software e Ingeniería del Conocimiento, Riobamba, Junio 4-5 2015, pp. 1-12.

Carlos Monsalve, Alain April, Alain Abran, "Business Process Modeling with Levels of Abstraction: A Survey of Practitioners with Experience", COLCOM 2015 - IEEE Colombian Conference on Communications and Computing, Popayán, Mayo 13-15 2015, pp. 1-6.

Ahmad Alomari, Alain April, Carlos Monsalve, "BPM+: Proposal of Specialized Stakeholders Operational-Level Perspectives and their BPMN Extensions", MRI-BP'2015 - Workshop on Methodologies for Robustness Injection into Business Processes, Montreal, Mayo 12-15 2015.

Carlos Monsalve, Héctor Puyosa, Luis Terán, "IEEE hack Ecuador challenge (HEC'15)", ICEDEG 2015 - Second International Conference on eDemocracy & eGovernment, Montreal, Abril 8-10 2015, pp. 1-4.

Carlos Monsalve, Alain April, Alain Abran, "On the Expressiveness of Business Process Modeling Notations for Software Requirements Elicitation", IECON 2012 - 38<sup>th</sup> Annual Conference on IEEE Industrial Electronics Society, Montreal, October 25-28 2012, pp. 3132-3137.

Carlos Monsalve, "Representation of Business Processes at Multiple Levels of Abstraction (Strategic, Tactical and Operational) during the Requirements Elicitation Stage of a Software Project, and the Measurement of their Size with ISO 19761", École de technologie supérieure - Université du Québec, Montréal – Canada, 2012.

Carlos Monsalve, Alain Abran, Alain April, "Measuring Software Functional Size from Business Process Models", International Journal of Software Engineering and Knowledge Engineering (IJSEKE), Vol. 21, No. 3, May 2011, pp. 311-338.

Carlos Monsalve, Alain April, Alain Abran, "BPM and Requirements Elicitation at Multiple Levels of Abstraction: A Review", IADIS International Conference on Information Systems 2011, Avila, Spain, International Association for Development of the Information Society March 11-13, pp. 237-242.

Carlos Monsalve, Alain April, Alain Abran, "Requirements Elicitation Using BPM Notations: Focusing on the Strategic Level Representation", 10<sup>th</sup> International Conference on Applied Computer and Applied Computational Science (ACACOS '11), Venice, Italy, WSEAS Press, March 8-10 2011, pp. 235-241.

Carlos Monsalve, Alain Abran, Alain April, "Functional Size Measurement with Business Process Models: the Business Application Domain", Joined International Conferences on Software Measurement – IWSM/MetriKon/Mensura 2010, Stuttgart, Germany, Edited by: Abran, Buren, Dumke, Cuadrado, Munch, Otto von Guericke University Magdeburg, Germany: Saker Verlag, November 10-12, pp. 277-290.

Carlos Monsalve, Alain April, Alain Abran, "Representing unique stakeholder perspectives in BPM notations", presented at the 8th ACIS International Conference on Software Engineering Research, Management and Applications (SERA2010), ACIS International, IEEE Computer Society, May 2010.

Juan Pablo Verdezoto, José Bermeo, Carlos Monsalve, "Asignación Automatizada de Frecuencias Fijas en una Red GSM Mediante un Algoritmo de Optimización", VI Jornadas de Investigación ESPOLciencia, 2007.

Xavier Franco, Carlos Monsalve, "Diseño e Implementación de un Algoritmo Para Asignación de HSN en una Red GSM y Evaluación del Mismo en el Simulador SMART", Revista Tecnológica ESPOL, Vol. 20, No. 1, October 2007, pp. 57-64.

Boris Vintimilla, Dennys Paillacho, Vismar Salamea, Carlos Monsalve, Francisco Novillo, "Hacia la Construcción de un Microrobot", IV Jornadas Iberoamericanas de Robótica, Ciudad de Panamá - Panamá, January 2003.

Boris Vintimilla, Carlos Monsalve, et al., "Sistemas Multiagentes Aplicados al Fútbol Robótico: Problemática Existente", IV Jornadas Iberoamericanas de Robótica, Ciudad de Panamá - Panamá, January 2003.

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Carlos Monsalve, "Diseño e Implementación de un Equipo de Robots Autónomos que Cooperan en Tiempo Real: Fútbol Robótico", I Jornadas de Investigación ESPOLciencia, 2002.

Carlos Monsalve, Guido Caicedo, Ruth Alvarez, Arturo Santana, Ana Tapia, Marcelo Loor, "Quicklook Technology Assessment of Bitmaps Based Map Information Technology", Bitworld Congress, June 2002.

Carlos Monsalve, David Dominguez, "Implementación de un Controlador de Acceso Integrado para el Sistema de Seguridad de los Laboratorios de la FIEC", Revista Tecnológica ESPOL, Vol. 13, No. 1, October 1999, pp. 42-45.

Carlos Monsalve, Giovanni Mazzari, "Seguridad de Redes de Computadoras ante Internet: Estudio, Diagnóstico e Implementación de Firewalls", Revista Tecnológica de ESPOL, Vol. 12, No. 1, October 1998, pp. 39 -44.

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**TEACHING AND PROFESSIONAL EXPERIENCE**

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- Dean of Research** 2017/11 -2022/11  
*ESPOL.*  
Coordinate the research efforts within all the institution. Responsible for part of the research budget for support of the research projects and research personnel. Elaboration of regulations related to research activities. Establishment and monitoring of the research goals and performance indicators.
- Director of the Computer Science Doctoral Program** 2014/11 –2017/11  
*ESPOL.*  
Responsible for the elaboration of the doctoral program proposal that was approved by the university board and the national governmental agency. Operation of the program after its approval.
- Director of the Center for Software Research, Innovation and Development** 2008/07 – 2009/01  
*Centro de Investigación, Desarrollo e Innovación del Software (CIDIS)*  
Creator and first director of this research center at Escuela Superior Politécnica del Litoral (ESPOL). The mission of this center is to research in software based systems with an emphasis in knowledge generation and transference to the local industry to support the creation of a technological cluster capable of being worldwide competitive.
- Executive Director of the National Research and Education Network** 2007/04 – 2008/12  
*Consortio Ecuatoriano para el Desarrollo de Internet Avanzado (CEDIA)*  
Director of the Ecuadorian NREN which at that moment agglutinated twenty science and technology institutions, most of them universities and polytechnic institutes. CEDIA is part of the Cooperación Latino Americana de Redes Avanzadas (CLARA), organism in charge of the Latin American Advanced Network. CEDIA promotes and coordinates the development of the Ecuadorian advanced network as a support for science, technology, innovation and education in Ecuador.
- ESPOL – SUPSI – RETECA Agreement Coordinator** 2005 – 2008  
*Escuela Superior Politécnica del Litoral*  
The RETECA foundation supports young engineers from developing countries in performing applied research during a stay at the University of Applied Sciences of Southern Switzerland (SUPSI) in the field of electrical engineering or in related areas. The scope is to train these young engineers in such a way that the acquired competencies will bear fruit after their return to their countries of origin.
- Professor** 1995/06 - present  
*Escuela Superior Politécnica del Litoral*, Department of Electrical and Computer Engineering.  
Full Professor since October the 31<sup>st</sup> of 2002. Obligated to teach at least one course, complemented with research, administrative and services activities.
- Member of the Department team for ABET accreditation.
  - President of the Rector & Vice Rectors Elections Board
  - Member of the Faculty Union Board
- LaBioProc Project Coordinator** 2005-2007  
*Escuela Superior Politécnica del Litoral.*  
International cooperation project financed by the ALFA program of the European Commission. An academic network was created to develop knowledge in Bioprocesses Control Theory. A main goal of this project was to develop an international Master of Science program for students from all the universities members of the formed network. The leader of the project was University of Ghent. Besides ESPOL and University of Ghent, the other members of the network were: Universidad de Caixas from Brazil (UCS), Coruniversitaria from Colombia, Technical University of Denmark (DTU), French National Institute for Agricultural Research (INRA), and Instituto Superior Técnico (IST) from the Technical University of Lisbon.
- Dean** 2003/03 – 2006/03  
*Escuela Superior Politécnica del Litoral*, Department of Electrical and Computer Engineering.  
Managed all the academic and administrative issues of the Department. The E&C Department is the biggest one at ESPOL.
- Developed the Master of Engineering Program in Industrial Control Processes.
  - Developed the Telematics Engineering Program.
  - Got the ISO Certification for all the undergraduate processes of the Department
  - Member of ESPOL Council

- Created the Computer Vision and Robotics Center
- Labs created: Digital Telecommunications, Microcontrollers, and Automated Control Systems.

**Under Dean** 1999/11 – 2003/03  
*Escuela Superior Politécnica del Litoral*, Department of Electrical and Computer Engineering.  
 Responsible of all the academic issues of the Department.

- Developed the Multimedia Systems Engineering Program.
- Created of the Software Development Center
- President of the Permanent Academic Commission of ESPOL
- Member of ESPOL Council
- Created the Software Engineering Lab.

**LASPAU Instructor** 2001-2002  
*Academic and Professional Programs for the America (LASPAU)*

LASPAU is a nonprofit organization affiliated with Harvard University and governed by an independent, inter-American board of trustees.

- One of the instructors for the international seminar “Estrategias Para la Integración de las Nuevas Tecnologías de Información en la Educación Superior” that was offered to academic directors and professors of Latin American universities.

**Undergraduate Program Chair** 1995/06 – 1999/11  
*Computer Engineering Program*, Department of Electrical and Computer Engineering.  
 Direct responsible of all the academic and administrative issues of the program.

**Computer Center Officer** 1990/01 – 1991/07, 1995/05 –1997/07  
*Computer Services Center*, ESPOL.

Chief of the Technical Department of the Center. This department planned and operated all the systems interconnection, preventive and corrective maintenance of the hardware systems, technical support for all the administration of the institution, acquisition of new computer systems, data communications systems.

**IADB –ESPOL Supervisor** 1991/09 – 1993/03  
*Escuela Superior Politécnica del Litoral*.

Project funded by IADB to build the new ESPOL campus, and to develop laboratories, technological and faculty capacities at ESPOL.

- Supervised the implementation of the new Voice and Data Communications System at ESPOL. This included the PABX system, its integration to the mainframe architecture, and the installation of a new telephone and data network all around the campus.
- Created and managed the Voice and Data Services office at ESPOL

**Assistant Professor** 1991 - 1992  
*Universidad Católica Santiago de Guayaquil. Engineering School.*

- Taught *Data Structures* course

#### OTHER RESEARCH ACTIVITIES

**Committee Chair** 2007  
*Jornadas de Sistemas de Telecomunicaciones (JST)*  
 First Ecuadorian Telecommunications Conference with an international scope. It received contributions from Spain, Colombia, Argentina, and Perú.

**Committees** 2008  
*Jornadas de Sistemas de Telecomunicaciones (JST)*  
 Member of the Technical Committee and Reviewer

*Jornadas Iberoamericanas de Ingeniería del Software y del Conocimiento (JIISIC)* 2008  
 This Hispano-American conference has become the international meeting of scientists, technicians and professionals devoted to Software Engineering and Knowledge Engineering study and research.

<i>Conferencia Técnica de la Región Andina del IEEE (ANDESCON)</i> Member of the Technical Committee ANDESCON is the main technical IEEE event for the Andean countries of Region 9	2006
<i>I, II &amp; III Jornadas de Ingeniería del Software</i> Operating Committee	2004 - 2006
<i>Jornadas de Investigación ESPOLCiencias</i> Operating Committee	2002
<i>BITworld: Facilitating Global IS Alliances</i> Operating Committee Conference organized by Manchester University and hosted by ESPOL.	2002

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#### PROFESSIONAL AFFILIATIONS & VOLUNTEERING

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<b>IEEE Volunteering</b>	
Chair of the Computer Society – Ecuador Section	2010/01 - present
Coordinator of student branch counselors R9	2006/02 – 2008/02
ESPOL's student branch counselor	2003/03 – 2008
<b>IEEE &amp; Technical Societies</b>	
IEEE member	2003-present
Computer Society member	2003-present
WIE member	2005-present
EMS member	2007-present
<b>International Association for Computer and Information Systems (ACIS)</b>	2010/03 - present

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#### HONORS, AWARDS & FUNDINGS

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<b>Computer Society Distinguished Visitor for LATAM</b> <i>IEEE Computer Society</i> The Distinguished Visitors Program (DVP) of IEEE has been operating since 1971 to offer to the Computer Society chapters the opportunity to have Access to high quality speakers.	2014-2016
<b>Governor General's Gold Medal</b> <i>École de technologie supérieure (ETS)</i> This medal is presented on behalf of the Governor General of Canada to recognize outstanding scholastic achievements at a graduate level. It is the most prestigious recognition awarded to postgraduate students in Canada.	2013
<b>Best Oral Presentation Award</b> <i>Software Requirements Session of the Software Track</i> <i>IECON 2012</i> Award granted by the Technical Committee of the IECON 2012 Conference to the best oral presentation of research work during the session.	November 2012
<b>Recognition of Institutional Merit</b> <i>Escuela Superior Politécnica del Litoral</i> Recognition awarded by ESPOL's Council to a faculty member who has demonstrated an outstanding academic life, serviced at different levels of administrative functions, and unconditionally supported ESPOL to fulfill all its goals.	October 2007
<b>ITU – CISCO Grant</b> <i>International Telecommunications Union and CISCO</i> A whole CCNA lab package was received (commercial value: \$10.000) as part of the Internet Training Centers program of the International Telecommunications Union. This program grants funding to universities from developing countries to build high-tech training centers.	2001
<b>Honor Diploma</b> <i>Escuela Superior Politécnica del Litoral</i>	Several years

Annual recognition for teaching merits of faculty members. It is awarded to the best teachers of each department according to the student evaluations during a whole academic year.

**Fulbright LASPAU Scholarship**

1993

*Fulbright Faculty Development Program*

Scholarship for studying at Purdue University, West Lafayette - Indiana. It covered all tuition, fees, insurance and living expenses for the whole period of the Master of Science program.