

# GERMÁN HARVEY ALFÉREZ SALINAS, Ph.D.

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Research Fellow (SNI) in the National Council of Science and Technology (CONACYT), Government of Mexico  
Research Fellow in the National Council for Science, Technology and Technological Innovation (CONCYTEC), Government of Peru

## SHORT BIO

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I am the director of the Institute of Data Science at the School of Engineering and Technology, Universidad de Morelos, Mexico. I hold a Ph.D. in Computer Science (Summa Cum Laude) from Universitat Politècnica de València (Spain), a MSc in Information and Communication Technology from Assumption University (Thailand), and a BSc in Computer Science Engineering from Universidad EAFIT (Colombia). Also, I am a certified Data Science and Big Data Analyst by the Massachusetts Institute of Technology (MIT), USA. I am currently a postdoctoral fellow at the Geoscience Research Institute, Loma Linda University, USA.

My research interests include Services Computing, Model-Driven Engineering, Models at Runtime, Autonomic Computing, Data Science, Big Data, and Dynamic Software Product Lines. I have contributed to publications in top journals, book chapters, and international conferences (Scopus h-index: 8). I have worked in universities, IT companies, and research groups of four continents (America, Asia, Australia, and Europe).

My research contributions have been recognized by the National Council of Science and Technology (CONACYT), Government of Mexico by awarding me a distinction in the National System of Researchers (SNI) during 2018-20. Also, I am a research fellow of Peru's National Council for Science, Technology and Technological Innovation (CONCYTEC) during 2016-20.

## RESEARCH INTERESTS

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Artificial Intelligence, Aspect-Oriented Software Development, Autonomic Computing, Big Data, Computer Vision, Data Science, Dynamic Software Product Lines, Model-Driven Software Development, Service-Oriented Architectures, and Software Product Lines

## ACADEMIC INFORMATION

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### Ph.D. in Computer Science

December 2013

- **University:** Universitat Politècnica de València, Spain
- **Thesis Title:** Achieving Autonomic Web Service Compositions with Models at Runtime (<http://hdl.handle.net/10251/34672>)
- **Degree of Praise:** Summa Cum Laude. Chosen as one of the best theses in 2013-2014 at Universitat Politècnica de València (<http://www.upv.es/entidades/EDOCTORADO/info/904322normalc.html>)

### Master of Science in Information and Communication Technology

January 2008

- **University:** Assumption University, Thailand
- **Specialty:** Technology Management
- **Thesis Title:** Aspect-Oriented Driven Variability in Software Product Lines (<https://www.dropbox.com/s/alem0tcwptp0v2x/ThesisHarveyAlferez.pdf>)
- **GPA:** 4.0/4.0. President's Award for Academic Excellence

## Bachelor of Science in Computer Science Engineering

December 2004

- **University:** Universidad EAFIT, Colombia
- **Specialty:** Software Engineering and Databases
- **Thesis Title:** Análisis de un Sistema de Información Bajo la Aproximación de la Orientación a Aspectos. Caso Práctico: Manejo de Solicitudes en la Mesa de Ayuda de Servicios Generales de una Universidad (<http://bdigital.eafit.edu.co:8080/bdng/query/single.xsp?idregistro=1815603>)
- **GPA:** 4.02/5.00

## WORK EXPERIENCE

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### Director, Institute of Data Science, School of Engineering and Technology, Universidad de Montemorelos, Mexico – <http://icd.um.edu.mx>

September 2018 – Present

- **Duties and Responsibilities:** Lead international research and industrial projects in data science and big data
- **Accomplishments:** I lead a team of four engineers. We are developing several internal and external projects related to data science and big data (<http://icd.um.edu.mx>). The external projects are being developed for organizations in the USA

### Director (Founder), Global Software Lab, School of Engineering and Technology, Universidad de Montemorelos, Mexico

August 2014 – Present

- **Duties and Responsibilities:** Lead international software-engineering research and development projects to solve current problems in industry, and society
- **Accomplishments:** Founder of this lab. Several software-related research and development projects have been carried out

### Professor, School of Engineering and Technology, Universidad de Montemorelos, Mexico

January 2014 – Present

#### Courses Taught:

- **Undergraduate:** Software Engineering, Artificial Intelligence, Artificial Neural Networks, Natural Language Processing, Pattern Recognition, Computer Vision, English for Engineers, and Introduction to Research
- **Master in Computer Science:** Software Engineering, Object Oriented Programming, Software Development Methodologies, and Research Project

### Sessional Lecturer, Graduate School of Engineering and Architecture, Peruvian Union University, Peru

January 2019 – May 2019

Taught a Ph.D. in Computer Science course on Big Data

### Sessional Lecturer, Department of Computer Science, Faculty of Arts & Sciences, Middle East University, Lebanon

January 2019 – May 2019

Taught a M.Sc. in Computer Science course on Artificial Intelligence and Neural Computation

**Researcher, Research Center on Software Production Methods, Universitat Politècnica de València, Spain**

October 2010 – December 2013

- **Duties and Responsibilities:** Ph.D. thesis work at this international research center
- **Accomplishments:** Several top international scientific publications. I leaded a joint project with Prof. Camille Salinesi and his team at Université Paris 1 Panthéon-Sorbonne. Our results were presented in the Journal of Systems and Software

**Director, Center for Research and Technology Development, School of Engineering and Technology, Universidad de Montemorelos, Mexico**

August 2008 – September 2010

- **Duties and Responsibilities:** Coordinated lecturers and students in projects with several important institutions such as NASA
- **Accomplishments:** Exponential growth of scientific publications and research projects

**Lecturer, School of Engineering and Technology, Universidad de Montemorelos, Mexico**

January 2008 – September 2010

**Courses Taught:**

- **Undergraduate:** Emergent Technologies, Object Oriented Programming, Software Engineering, Systems Analysis and Design, and Visual Programming
- **Master in Computer Science:** Object Oriented Methodologies, Software Architectures, Software Engineering, Software Development, and Object-Oriented Programming

**Coordinator, Computer Information Systems Department, Faculty of Business Administration, Asia-Pacific International University (Formerly Mission College), Thailand**

August 2007 – December 2007

- **Duties and Responsibilities:** Monitored program quality and integrity. Managed the assessment process (curriculum, advising, placement, cooperative education, and internships). Recruited and supervised associate faculty
- **Accomplishments:** Creation of the IT Evangelistic Team. In this team a group of students developed IT solutions to support education in Southeast Asia

**Sessional Lecturer, School of Education, Avondale College, Australia**

July 2006 – April 2007

Master of Education (Extension in Asia-Pacific International University): Sessional academic employment to support IT-related research projects

**Lecturer, Computer Information Systems Department, Faculty of Business Administration, Asia-Pacific International University, Thailand**

June 2005 – December 2007

**Courses Taught:** Essentials of Computer Programming, Network and Data Communications, Web-Based Application Development, Visual Basic Programming, Systems Analysis and Design, and Computer Business Applications

**Systems Analyst and Web Manager, Information Technology Systems Department, Asia-Pacific International University, Thailand**

June 2005 – July 2007

- **Duties and Responsibilities:** Analyzed, developed, and improved software. Developed the website and the intranet of this university
- **Accomplishments:** Development of The Dorado Project, a multi-layered Web application that integrates several departments

**Systems Analyst, UNE (Formerly Orbitel S.A. E.S.P), Colombia**

July 2003 – December 2003

- **Duties and Responsibilities:** Managed the development cycle of a system for the quality and productivity of the company's processes using the Rational Unified Process (RUP) and the Capability Maturity Model (CMM)
- **Accomplishments:** Pioneer using Visual Studio .NET and MySQL in this international company. The financial benefits of the developed system were presented to the president and vice-presidents of this company

**Researcher, Software Engineering Research Group, EAFIT University, Colombia**

February 2001 – June 2001; January 2003 – May 2003

**Duties and Responsibilities:** Developed and maintained several software tools

**CERTIFICATION, DISTINCTIONS AND PROFESSIONAL AFFILIATION**

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- I am a certified Data Science and Big Data Analyst by the Massachusetts Institute of Technology (MIT), USA. October 30<sup>th</sup>, 2018. <https://mitxpro.mit.edu/certificates/4bd210437eab48209491be3f1042db79>
- My research contributions have been recognized by the National Council of Science and Technology (CONACYT), Government of Mexico by awarding me a distinction in the National System of Researchers (SNI). 2018-20
- Research fellow of Peru's National Council for Science, Technology and Technological Innovation (CONCYTEC) - [http://directorio.concytec.gob.pe/appDirectorioCTI/VerDatosInvestigador.do;jsessionid=8198533c7e730193d79f3e27ed59?id\\_investigador=82190](http://directorio.concytec.gob.pe/appDirectorioCTI/VerDatosInvestigador.do;jsessionid=8198533c7e730193d79f3e27ed59?id_investigador=82190). 2016-20
- Member of the IEEE Monterrey Section. Member of the IEEE Computer Society. 2017

**SOFTWARE KNOWLEDGE**

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- **Languages:** Java, .NET (Visual Basic and C#), C, C++, JavaScript, SQL, and PL/SQL
- **Data Science:** Python, R, Weka, TensorFlow, Scikit-Learn, Alteryx, and Tableau
- **Big Data:** Apache Spark, Apache Kafka, MongoDB, and Apache Cassandra
- **Mathematical and Statistical Analysis:** Jamovi, PSPP, Statgraphics, WinQSB, and LAPACK
- **DBMS:** Oracle, Oracle Forms, SQL Server, MySQL, PostgreSQL, and MS Access
- **Web Site Design:** Dreamweaver
- **UML Modeling:** Rational Rose, Visual Paradigm, and Enterprise Architect
- **Application Servers:** IIS, Apache Tomcat, and Flask
- **Development of Web Services and Web Service Compositions:** Apache Axis2, Apache CXF, and Apache ODE (WS-BPEL)
- **Business Process Management:** Activiti (BPMN2) and Babel
- **Models at Runtime:** EMF and Jena
- **Others:** OSGi, AspectJ, OpenCV, Eclipse, NetBeans, XML, and several free and open-source applications

## RELEVANT PROJECTS

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- Project leader in several intensive data science projects in Montemorelos University. 2015-2019. Contact: Alejandro García (awgarcia@um.edu.mx).
- Project leader in a data strategy project for the North American Division of the Seventh-day Adventist Church. I proposed a prototype of a platform to build and manage the strategic plan of the Division at different levels. July 2018. Contact: Elder Alvin Kibble (AlvinKibble@nadadventist.org).
- Project leader in a data science project for the North American Division of the Seventh-day Adventist Church. May-June, 2017. Contact: Elder Alvin Kibble (AlvinKibble@nadadventist.org).
- Researcher in the SMART ADAPT Project (TIN2013-42981-P, Ministry of Economy and Competitiveness, Spain): Adaptive Software Development in an Intelligent World. Technological Challenges in Model Driven Engineering. 2015-2017. Contact: Dr. Vicente Pelechano (pele@dsic.upv.es).
- Researcher in the EVERYWARE project (TIN2010-18011, Ministry of Science and Innovation, Spain): Building Adaptive Software for Integrating People, Services and Things using Models at Runtime. 2011-2013. Contact: Dr. Vicente Pelechano (pele@dsic.upv.es).

## REVIEWER

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- **Peer reviewer for grants calls**
  - UK Natural Environment Research Council (NERC) Standard grants call, 2020.
  - Mexican National Council of Science and Technology (CONACYT) grants call, 2018.
- **Peer reviewer for journals**
  - Journal of Digital Imaging, Springer.
  - Machine Vision and Applications, Springer.
  - Journal of Cereal Science, Elsevier.
  - IEEE Access.
  - Revista Internacional de Estudios Sobre Educación, Universidad de Montemorelos.
  - ACM Transactions on Software Engineering and Methodology (TOSEM).
  - Frontiers of Computer Science, Springer.
  - Informatics in Medicine Unlocked, Elsevier.
  - Journal of Computational Methods in Sciences and Engineering (JCMSE), IOS Press.
  - Journal of Information Technology & Software Engineering, OMICS.
  - CyberTech Publishing's International Advisory Review Board.
- **Peer reviewer for research conferences**
  - 2018 International Conference on Adaptive and Self-Adaptive Systems and Applications, ADAPTIVE 2018, Barcelona, Spain, February 18-22, 2018.
  - 2017 International Conference on Adaptive and Self-Adaptive Systems and Applications, ADAPTIVE 2017, Athens, Greece, February 19-23, 2017.
  - 2016 Software Product Lines Conference, SPLC 2016. Beijing, China, September 19-23, 2016.
  - 2015 Software Product Lines Conference, SPLC 2015. Nashville, USA, July 20-24, 2015.
  - 7th International Conference on Research Challenges in Information Science, RCIS 2013. Paris, France, May 29-31, 2013.
  - 25th International Conference on Advanced Information Systems Engineering, CAiSE 2013. Valencia, Spain, June 17-21, 2013.

## ADDITIONAL INFORMATION

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My website contains the following additional information:

- Software development projects: [http://www.harveyalferez.com/software\\_products\\_prototypes.html](http://www.harveyalferez.com/software_products_prototypes.html)
- Projects and presentations in the news (Adventist Review, Adventist News Network, etc.): <http://www.harveyalferez.com/press.html>

- Presentations in several international venues (Andrews University, Loma Linda University, GAIN (General Conference of the Seventh-day Adventist Church, etc.):  
[http://www.harveyalferez.com/relevant\\_presentations.html](http://www.harveyalferez.com/relevant_presentations.html)
- Podcasts (in Spanish): <http://www.harveyalferez.com/podcasts.html>
- Other interests: [http://www.harveyalferez.com/other\\_interests.html](http://www.harveyalferez.com/other_interests.html)

## Publications

**h-index:** 8 (<https://www.scopus.com/authid/detail.uri?authorId=53363255000>).

### International Scientific Journal Articles

- Aguilar, K. Alf3rez, G.H., Aguilar, C. (2020). Detection of difficult airway using deep learning. *Machine Learning and Applications*, 31(4).
- Quiroz, I.A. & Alf3rez, G.H. (2020). Image recognition of legacy blueberries in a Chilean smart farm through deep learning. *Computers and Electronics in Agriculture*, 168.
- Alf3rez, G.H. & Pelechano, V. (2017). Achieving autonomic Web service compositions with models at runtime. *Computers and Electrical Engineering*, 63, 332-352.
- Heradio, R., P3rez-Morago, H., Alf3rez, M., Fern3ndez-Amoros, D., Alf3rez, G.H. (2016). Augmenting measure sensitivity to detect essential, dispensable and highly incompatible features in mass customization. *European Journal of Operational Research*, 248(3), 1066-1077.
- Alf3rez, G.H. & Pelechano, V. (2014). Facing uncertainty in web service compositions. *International Journal of Services Computing*, 2(2), 1-16.
- Alf3rez, G.H., Pelechano, V., Mazo, R., Sailinesi, C., & Diaz, D. (2014). Dynamic adaptation of service compositions with variability models. *Journal of Systems and Software*, 91, 24-47.
- Tabares, M. S., Alf3rez, G.H., & Alf3rez, E.M. (2008). El desarrollo de software orientado a aspectos: Un caso pr3ctico para un sistema de ayuda en l3nea. *Avances en Sistemas e Inform3tica, Universidad Nacional de Colombia*, 5(2), 61-68.
- Alf3rez, G.H. & Poonphon, S. (2007). An aspect-oriented product line framework to support the development of software product lines of web applications. *International Journal of the Computer, the Internet and Management*, 15(SP4), 13.1-13.5.

### International Journal Articles

- Alf3rez, G.H. (2016). Tweeting in New York City - data science can teach us to sympathize. *Adventist Review*, 193(2), 47-49.
- Alf3rez, G.H. (2015). Big data for reaching a big world. *Adventist Review*, 192(11), 47-51.

### Scientific Articles in Proceedings of International Events

- Synice, J. & Alf3rez, G.H. (2018). Dynamic Evolution of Simulated Autonomous Cars in the Open World Through Tactics. Proceedings of the *Future Technologies Conference 2018 (FTC 2018)*, Vancouver, Canada.
- Espinoza, M., Alf3rez, G.H., & Castillo, J. (2018). Prediction of Glaucoma through Convolutional Neural Networks. Proceedings of the *2018 International Conference on Health Informatics and Medical Systems (HIMS 2018)*, Las Vegas, NV, USA.
- Medina, J., Urango, O., Arboleda, W., Alf3rez, G.H., & Anaya, R. (2016). Implementaci3n de una Arquitectura Open Health Data para la gesti3n y consumo de datos de salud. Proceedings of the *2o Congreso de Investigaci3n Universitaria de la Divisi3n Interamericana (CIDIA 2016)*, Montemorelos, NL, Mexico.
- Alf3rez, G.H., Jim3nez, J., Hern3ndez-Navarro, H., Gonz3lez, M., Dom3nguez, R., Briones, A., & Hern3ndez-Villalvazo, H. (2016). Aplicaci3n de ciencia de datos en las historias cl3nicas de una cl3nica ubicada en el noreste de M3xico para corroborar la relaci3n entre caries dental y diabetes. Proceedings of the *2o Congreso de Investigaci3n Universitaria de la Divisi3n Interamericana (CIDIA 2016)*, Montemorelos, NL, Mexico.
- Alf3rez, G.H., Jim3nez, J., Hern3ndez-Navarro, H., Gonz3lez, M., Dom3nguez, R., Briones, A., Hern3ndez-Villalvazo, H. (2016). Application of Data Science to Discover the Relationship between Dental Caries and Diabetes in Dental Records. Proceedings of the *2016 International Conference on Health Informatics and Medical Systems (HIMS 2016)*, Las Vegas, NV, USA.

- Alférez, G.H., Rodríguez, J., Clausen, B., & Pompe, L.R. (2015). Interpreting the Geochemistry of Southern California Granitic Rocks Using Machine Learning. Proceedings of the *2015 International Conference on Artificial Intelligence (ICAI 2015)*, Las Vegas, NV, USA.
- Zabala, B. & Alférez, G.H. (2015). Proactive Control of Traffic in Smart Cities. Proceedings of the *2015 International Conference on Artificial Intelligence (ICAI 2015)*, Las Vegas, NV, USA.
- Marín, C., Alférez, G.H. Córdova, J., & González, V. (2015). Detection of Melanoma Through Image Recognition and Artificial Neural Networks. Proceedings of the *2015 IUPESM World Congress on Medical Physics and Biomedical Engineering (WC 2015)*, Toronto, Canada.
- Torres, M., & Alférez, G.H. (2014). Software Architecture Evolution in the Open World through Genetic Algorithms. Proceedings of the *2014 International Conference on Software Engineering Research and Practice (SERP 2014)*, Las Vegas, NV, USA.
- Alférez, G.H. & Pelechano, V. (2013). Facing Uncertainty in Web Service Compositions. Proceedings of the *IEEE 20th International Conference on Web Services (ICWS 213)*, Santa Clara, CA, USA.
- Alférez, G.H. & Pelechano, V. (2012). Dynamic Evolution of Context-Aware Systems with Models at Runtime. Proceedings of the *ACM/IEEE 15th International Conference on Model Driven Engineering Languages & Systems (MODELS 2012)*, Innsbruck, Austria.
- Ayora, C., Alférez, G.H., Torres, V., Pelechano, V. (2012). Applying CVL to Business Process Variability Management. Proceedings of the *VARY workshop at MODELS 2012*, Innsbruck, Austria.
- Alférez, G.H. & Pelechano, V. (2011). Context-Aware Autonomous Web Services in Software Product Lines. Proceedings of the *15th International Software Product Line Conference (SPLC'11)*, München, Germany.
- Alférez, G.H. & Pelechano, V. (2011). Systematic Reuse of Web Services through Software Product Line Engineering. Proceedings of the *European Conference on Web Services 2011 (ECOWS'11)*, Lugano, Switzerland.
- Ayora, C., Alférez, G.H., Torres, V., Pelechano, V. (2011). Procesos de Negocio Auto-Adaptables al contexto. Proceedings of the *VII Jornadas de Ciencia e Ingeniería de Servicios (JCIS 2011)*, A Coruña, Spain.
- Alférez, G.H. (2009). Grupos de Investigación Tecnológica en Universidades Adventistas: Educación y Misión. Proceedings of the *39th International Seminar on the Integration of Faith and Learning*, Montemorelos, Mexico.

## Book

Alférez, G.H. (2020). Ideas para docentes-investigadores adventistas. Editorial Publicaciones Universidad de Montemorelos, México. ISBN: 978-607-8001-21-7.

## Book Chapters

- Alférez, G.H. & Mazo, R. (2018). Integración de los modelos de componentes con los modelos de variabilidad. In Mazo, R. (Ed.), *Guía Para la Adopción Industrial de Líneas de Productos de Software* (pp. 385-393). Medellín, Colombia: Editorial Eafit. ISBN 978-958-720-506-0.
- Pelechano, V., Fons, J., Alférez, G.H., & Gómez, M. (2012). Modelos en tiempo de ejecución. In García, J. et al. (Eds.), *Desarrollo de Software Dirigido por Modelos: Conceptos, Métodos y Herramientas* (pp. 529-551). Madrid, Spain: RA-MA. ISBN 978-84-9964-215-4.
- Alférez, G.H. & Alférez, E.M. (2011). An aspect-oriented framework to model non-functional requirements in software product lines of service-oriented architectures. In N. Milanovic (Ed.), *Methodologies for Non-Functional Requirements in Service Oriented Architecture: Requirements Engineering, Model-Driven Development and Security* (pp. 246-267). Hershey, Pennsylvania, USA: IGI Global. ISBN ISBN:1605667943 9781605667942.

## Technological and Scientific Magazines

- Cruz, E. & Alférez, G.H. (2014). Gestionando procesos de negocios usando BPMN 2.0. *Software Guru*, 46, 32-33.
- Serrano, J.A., Regalado, L.C., Villa, V.F., & Alférez, G.H. (2014). Diagnóstico físico utilizando Google Glass y machine learning. *Software Guru*, 45, 50-51.



- Núñez, R. & Alférez G.H. (2012). Propuesta para el mejoramiento de Adventist Forge (second part). *Revista Unaciencia, Corporación Universitaria Adventista*, 8, 25-33.
- Alférez, G.H., & Avila, P.D. (2010). Documentando en Scrum con Google Wave. *Software Guru*, 27, 18-19.
- Mago, E.R. & Alférez G.H. (2010). El papel de la arquitectura de software en Scrum. *Software Guru*, 30, 38-40.
- Núñez, R. & Alférez G.H. (2011). Propuesta para el mejoramiento de Adventist Forge (first part). *Revista Unaciencia, Corporación Universitaria Adventista*, 6, 26-29.
- Sánchez, R.J., Hernández, J., & Alférez, G.H. (2010). Repositorio de componentes de software para sistemas de la Iglesia Adventista del Séptimo Día. *Revista Unaciencia, Corporación Universitaria Adventista*, 4, 144-152.
- Alférez, G.H. & Alférez, E.M. (2009). Utilización de CLAPACK para resolver sistemas de ecuaciones lineales mediante paralelismo y optimización de memoria. *Revista Unaciencia, Corporación Universitaria Adventista*, 3, 27-33.
- Soto, O.O. & Alférez, G.H. (2009). An architecture proposal for academic software in Adventist universities. *Catalyst, Asia-Pacific International University*, 4(1), 35-44.
- Soto, O.O. & Alférez, G.H. (2009). Scrum, ¿un paradigma de administración de proyectos que cumple lo que promete? *Software Guru*, 25, 35-37.
- Alférez, G.H. (2008). Measurement of the support in the development stages of an aspect-oriented software product line framework. *Catalyst, Asia-Pacific International University*, 3(1), 14-24.

#### **Master Theses Advised**

- González, M. (2018). Software Para la Aplicación de Ciencia de Datos en la Unión del Medio Oriente y Norte de África. Caso de Estudio en Iraq. Maestría en Ciencias Computacionales. Universidad de Morelos, Mexico.
- Domínguez, R. (2017). Aplicación de Ciencia de Datos para la Creación de Software Predictivo de Morbimortalidad Materna en México. Maestría en Ciencias Computacionales. Universidad de Morelos, Mexico.
- De La Fuente, J. (2012). Herramienta para la Generación y Despliegue de Composiciones de Servicios Web Mediante Modelos BPMN. Máster en Ingeniería del Software, Métodos Formales y Sistemas de la Información. Universitat Politècnica de València, Spain.