

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

I am the director of the Institute of Data Science and a computer science professor at the School of Engineering and Technology, Universidad de Morelos, Mexico. Also, I am currently a postdoctoral fellow at the Geoscience Research Institute, Loma Linda University, USA.

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.

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 2018-23. Also, I am a research fellow of Peru's National Council for Science, Technology and Technological Innovation (CONCYTEC) during 2016-21.

RESEARCH INTERESTS

Artificial Intelligence, Autonomic Computing, Big Data, Computer Vision, Data Science, Dynamic Software Product Lines, Machine Learning, Model-Driven Software Development, Natural Language Processing, Service-Oriented Architectures, and Software Product Lines

ACADEMIC INFORMATION

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

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

- I am a certified Data Science and Big Data Analyst by the Massachusetts Institute of Technology (MIT), USA. October 30th, 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. 2016-20
- Member of the IEEE Monterrey Section. Member of the IEEE Computer Society. 2017

SOFTWARE KNOWLEDGE

- **Languages:** Java, .NET (Visual Basic and C#), C, C++, JavaScript, SQL, and PL/SQL
- **Data Science and Artificial Intelligence:** Python, R, Weka, TensorFlow, Scikit-Learn, NLTK, SpaCy, 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

- Post-doctoral Research on Data Science Applied to Geochemical Data within a Seventh-day Adventist Paradigm, sponsored by the Faith and Science Council of the Seventh-day Adventist Church (\$36,100 USD). 2020-2021. Contact: Dr. Benjamin L. Clausen (bclausen@llu.edu).
- 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

- **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**
 - 2021 International Conference on Adaptive and Self-Adaptive Systems and Applications, ADAPTIVE 2021.
 - 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

My website contains the following additional information:

- Software development projects: 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
- Podcasts (in Spanish): <http://www.harveyalferez.com/podcasts.html>
- Other interests: 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. Alférez, G.H., Aguilar, C. (2020). Detection of difficult airway using deep learning. *Machine Learning and Applications*, 31(4).
- Quiroz, I.A. & Alférez, G.H. (2020). Image recognition of legacy blueberries in a Chilean smart farm through deep learning. *Computers and Electronics in Agriculture*, 168.
- Alférez, G.H. & Pelechano, V. (2017). Achieving autonomic Web service compositions with models at runtime. *Computers and Electrical Engineering*, 63, 332-352.
- Heradio, R., Pérez-Morago, H., Alférez, M., Fernández-Amoros, D., Alférez, 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.
- Alférez, G.H. & Pelechano, V. (2014). Facing uncertainty in web service compositions. *International Journal of Services Computing*, 2(2), 1-16.
- Alférez, 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., Alférez, G.H., & Alférez, E.M. (2008). El desarrollo de software orientado a aspectos: Un caso práctico para un sistema de ayuda en línea. *Avances en Sistemas e Informática, Universidad Nacional de Colombia*, 5(2), 61-68.
- Alférez, 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

- Alférez, G.H. (2016). Tweeting in New York City - data science can teach us to sympathize. *Adventist Review*, 193(2), 47-49.
- Alférez, 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. & Alférez, 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., Alférez, 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., Alférez, G.H., & Anaya, R. (2016). Implementación de una Arquitectura Open Health Data para la Gestión y Consumo de Datos de Salud. Proceedings of the *2o Congreso de Investigación Universitaria de la División Interamericana (CIDIA 2016)*, Montemorelos, NL, Mexico.
- Alférez, G.H., Jiménez, J., Hernández-Navarro, H., González, M., Domínguez, R., Briones, A., & Hernández-Villalvazo, H. (2016). Aplicación de Ciencia de Datos en las Historias Clínicas de una Clínica Ubicada en el Noreste de México para Corroborar la Relación entre Caries Dental y Diabetes. Proceedings of the *2o Congreso de Investigación Universitaria de la División Interamericana (CIDIA 2016)*, Montemorelos, NL, Mexico.
- Alférez, G.H., Jiménez, J., Hernández-Navarro, H., González, M., Domínguez, R., Briones, A., Hernández-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. (2021). Intelligent computational agents require a designer. In Gibson, L.J. et al. (Eds.), *Design and Catastrophe: 51 Scientists Explore Evidence in Nature*. Berrien Springs, Michigan, USA: Andrews University Press. ISBN 978-1-940980-30-0.
- 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:1605667943 9781605667942.

Technological and Scientific Magazines

- Cruz, E. & Alf  rez, 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., & Alf  rez, G.H. (2014). Diagn  stico f  sico utilizando Google Glass y machine learning. *Software Guru*, 45, 50-51.
- N    ez, R. & Alf  rez G.H. (2012). Propuesta para el mejoramiento de Adventist Forge (second part). *Revista Unaciencia, Corporaci  n Universitaria Adventista*, 8, 25-33.
- Alf  rez, G.H., & Avila, P.D. (2010). Documentando en Scrum con Google Wave. *Software Guru*, 27, 18-19.
- Mago, E.R. & Alf  rez G.H. (2010). El papel de la arquitectura de software en Scrum. *Software Guru*, 30, 38-40.
- N    ez, R. & Alf  rez G.H. (2011). Propuesta para el mejoramiento de Adventist Forge (first part). *Revista Unaciencia, Corporaci  n Universitaria Adventista*, 6, 26-29.
- S  nchez, R.J., Hern  ndez, J., & Alf  rez, G.H. (2010). Repositorio de componentes de software para sistemas de la Iglesia Adventista del S  ptimo D  a. *Revista Unaciencia, Corporaci  n Universitaria Adventista*, 4, 144-152.
- Alf  rez, G.H. & Alf  rez, E.M. (2009). Utilizaci  n de CLAPACK para resolver sistemas de ecuaciones lineales mediante paralelismo y optimizaci  n de memoria. *Revista Unaciencia, Corporaci  n Universitaria Adventista*, 3, 27-33.
- Soto, O.O. & Alf  rez, G.H. (2009). An architecture proposal for academic software in Adventist universities. *Catalyst, Asia-Pacific International University*, 4(1), 35-44.
- Soto, O.O. & Alf  rez, G.H. (2009). Scrum,   un paradigma de administraci  n de proyectos que cumple lo que promete? *Software Guru*, 25, 35-37.
- Alf  rez, 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

- Gonz  lez, M. (2018). Software Para la Aplicaci  n de Ciencia de Datos en la Uni  n del Medio Oriente y Norte de   frica. Caso de Estudio en Iraq. Maestr  a en Ciencias Computacionales. Universidad de Morelia, Mexico.
- Dom  nguez, R. (2017). Aplicaci  n de Ciencia de Datos para la Creaci  n de Software Predictivo de Morbimortalidad Materna en M  xico. Maestr  a en Ciencias Computacionales. Universidad de Morelia, Mexico.
- De La Fuente, J. (2012). Herramienta para la Generaci  n y Despliegue de Composiciones de Servicios Web Mediante Modelos BPMN. M  ster en Ingenier  a del Software, M  todos Formales y Sistemas de la Informaci  n. Universitat Polit  cnica de Val  ncia, Spain.