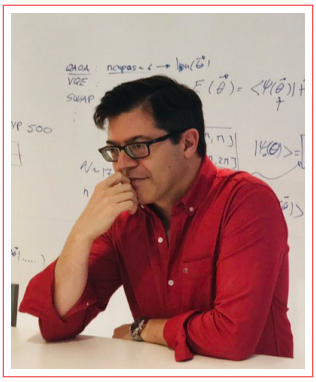

Jose L. Salmerón

Current position

Principal Data Scientist
Capgemini Engineering

Professor of Data Science
University Pablo de Olavide

Professional experience

2020- **Principal Data Scientist**, *Capgemini Engineering*, Spain.

- **[AI4HealthyAging] (NextGenEU) Inteligencia Artificial distribuida para el diagnóstico y tratamiento temprano de enfermedades con gran prevalencia en el envejecimiento** (2021-2023)
  - Goals: Federated Learning, Explainable Artificial Intelligence, Deep Learning, Anomaly detection
  - Activities: Technical and research leadership, algorithms design.
  - Team: 60 (profiles: 60% data scientists, 40% health experts (Physician and Biomedical engineers))
  - Technologies: Python, PyTorch, PySyft, and others
  - Budget: 12.000.000 €
- **[QML] Quantum Machine Learning for real-world environments** (2021-2022)
  - Goals: Quantum Deep Learning, Variational Quantum Circuits, Quantum Denoising Autoencoders
  - Activities: Algorithms design, coding, experimental approach, team leadership and management
  - Team: 4 (profiles: 100% data scientists)
  - Technologies: Python, PyTorch, IBM Q Experience, Qiskit
- **[COVIDSION] Artificial Intelligence multipurpose for pandemics response** (2020-2021)
  - Goals: Deep Learning algorithms (CNN, LSTM, DN), Federated Learning, Explainable Artificial Intelligence, NLP
  - Activities: Algorithms design, coding, experimental approach, team leadership and management
  - Team: 8 (profiles: 80% data scientists, 20% physicians)

- Technologies: Python, PyTorch

- **[COVID] Federated Computer Vision for COVID diagnosis** (2020-2021)
  - Goals: Deep Learning algorithms (CNN), Federated Learning
  - Activities: Algorithms design, coding, experimental approach, team leadership and management
  - Team: 5 (profiles: 90% data scientists, 10% physicians). Consortium with Intel Corp., Vodafone, Cisco and Gilead.
  - Technologies: Python, Tensorflow, Azure

- **[SCIRUP] Deep Learning-based process automatization in industry** (2020)
  - Goals: Deep Learning algorithms, NLP and Computer Vision for industrial processes automation
  - Activities: Algorithms design, coding, experimental approach, team leadership and management
  - Team: 7 (profiles: 66% data scientists, 33% managers)
  - Technologies: Python, AWS

- **A400M Wing Fit for Airbus Military** (2020)
  - Goals: Feasibility analysis of a Machine Learning-based virtual photogrammetry for wing fit.
  - Activities: Algorithms design, coding, experimental approach, team leadership and management
  - Team: 5 (profiles: 40% data scientists, 40% Aeronautical engineers. 20% managers)
  - Technologies: Python, Open3D, Catia3D

2018-2020 **Lead Data Scientist**, *BBVA New Digital Business*, Spain.

- **Avoiding Bias and Unfairnes in Artificial Intelligence** (2020)
  - Goals: Designing algorithms for avoiding Bias and promoting Fairness in Financial Machine Learning
  - Activities: Algorithms design, coding, experimental approach, team leadership and management
  - Team: 3 (profiles: 66% data scientists, 33% managers)
  - Technologies: Python, AWS

- **Data poisoning detection in Distributed Artificial Intelligence** (2019-2020)
  - Goals: Data poisoning detection and sanitisation countermeasures in distributed artificial intelligence environments for home equity line credit
  - Activities: Algorithms design, coding, experimental approach, team leadership and management
  - Team: 9 (profiles: 50% data scientists, 50% developers)
  - Technologies: Python, AWS, Openmined

- **Contribution importance in Distributed Artificial Intelligence** (2019-2020)
  - Goals: Participants' contribution assessment in federated learning for machine learning-based home equity line credit
  - Activities: Algorithms design, coding, experimental approach, team leadership and management
  - Team: 9 (profiles: 50% data scientists, 50% developers)
  - Technologies: Python, AWS, tensorflow federated

- **Distributed Artificial Intelligence in asymmetric environments** (2019-2020)
  - Goals: Accuracy improvement in Federated Learning with scarce financial datasets
  - Activities: Algorithms design, coding, experimental approach, team leadership and management
  - Team: 7 (profiles: 50% data scientists, 50% business people)
  - Technologies: Python, AWS, Openmined

- **Secure Multiparty Computation for financial risk scoring** (2019)
  - Goals: Accuracy and perfomance improvement in financial risk scoring
  - Activities: Algorithms design, coding, experimental approach, team leadership and management
  - Team: 4 (profiles: 75% data scientists, 25% business people)
  - Technologies: Python, Secure MultiParty Computation
- **Opening the black-box of Deep Learning** (2019)
  - Goals: Computing the most critical paths in different deep neural architectures using multicriteria analysis for home equity line of credit.
  - Activities: Algorithms design, coding, experimental approach, team leadership and management
  - Team: 4 (profiles: 50% data scientists, 50% developers)
  - Technologies: Python, AWS
- **Human-friendly local explanations of financial services rejection** (2019)
  - Goals: Natural language-based local explanations for black-box machine learning models in finance
  - Activities: Algorithms design, coding, experimental approach, team leadership and management
  - Team: 3 (profiles: 66% data scientists, 33% business people)
  - Technologies: Python, AWS
- **Quantum-inspired Optimization in Finance** (2019)
  - Goals: Portfolio optimization with quantum-inspired algorithms
  - Activities: Algorithms design, coding, experimental approach, team leadership and management
  - Team: 2 (profiles: 60% data scientists, 40% business people)
  - Technologies: Python, AWS, IBM
- **Explainable Artificial Intelligence in finance** (2018-2019)
  - Goals: Global and local explainability for black-box machine learning models for financial datasets
  - Activities: Algorithms design, coding, experimental approach, team leadership and management
  - Team: 6 (profiles: 50% data scientists, 34% developers, 16% business people)
  - Technologies: Python, AWS
- **Machine Learning for financial risk scoring** (2018)
  - Goals: Risk scoring accuracy improvement with advanced machine learning models
  - Activities: Algorithms design, coding, experimental approach, team leadership and management
  - Team: 5 (profiles: 80% data scientists, 20% business people)
  - Technologies: Python, AWS

2018-2020 **Principal Data Scientist**, *Canadian Institutes of Health Research (CIHR)*.

- **Artificial INTELLIGENce for efficient community based primary healTh CARE** (2018-2019)
  - Goals: Development of an intelligent system to optimize emergency queues. The system included an automatic triage
  - Activities: Algorithms design, coding, experimental approach, technical team leadership
  - Team: 4 (profiles: 40% data scientists, 60% phsysicians)
  - Technologies: Python, AWS

- **[Xi-Care] eXplainable intelligent system for Cardiovascular disease management among women in primary Care** (2020-2021)
  - Goals: Strategy for Patient-Oriented Research (SPOR)
  - Activities: Algorithms design, coding, experimental approach, technical team leadership
  - Team: 8 (profiles: 50% data scientists, 50% phsysicians)
  - Technologies: Python, AWS

2017-2018 **Mentor**, *McKinsey*, Brussels (Belgium).

- Serving as an external mentor for a senior BA consultant.

2014-2017 **Director of the technical committee and Principal Data Scientist**, *European Comission*.

- **Integrated Support System for Efficient Water Usage and Resources Management**
  - Goals: Development of an intelligent system for efficient for urban water management. The system adjusted the pressure in the pipes according to the demand forecast to minimize losses. The system also combined different water sources minimising on cost and pollutants
  - Activities: Algorithms design, coding, experimental approach, team leadership and management
  - Team: 4 (profiles: 75% data scientists, 25% thermal engineers)
  - Technologies: .Net, MySQL, AngularJS

2014-2018 **IT projects evaluator**, *DNV GL, OCAcert, TÜV Rheinland*.

- Goals: Technical assessment of diferent IT projects

2017-2019 **Lead Data Scientist**, *Wellness Telecom*.

- **Recommender system for energy efficiency in buildings** (2017-2019)
  - Goals: Development of a system for energy efficiency recommendation in urban buildings
  - Activities: Algorithms design, coding, experimental approach, team leadership and management
  - Team: 4 (profiles: 75% data scientists, 25% thermal engineers)
  - Technologies: Javascript, MongoDB, ExpressJS, AngularJS, NodeJS

2012- **Main partner of *Proyectos, Tecnología e Ingeniería Smart, S.L.***

- **Artificial Intelligence projects in different industries**
  - Role: Technical director
  - Team: 4-10 (profiles: 40% data scientists, 50% developers, 10% business people)
  - Technologies: Python, R, Javascript, HTML5, PHP, MySQL, MongoDB, AWS, Azure

2009-2013 **GEA 21, S.A.**

- **Environmental control system for civil engineering** (2011-2013)
  - Goal: Design and development of a control system for environmental impact forecasting in civil engineering. The intelligent system made an environmental estimation before it happened. In this way, the alternative with the lower environmental impact could be chosen before carrying out the works.
  - Activities: Algorithms design, coding, experimental approach, team leadership and management
  - Team: 4 (profiles: 50% data scientists, 50% civil engineers)
  - Technologies: Python, Javascript, HTML5, MySQL
- **Intelligent system for labour risk prevention in civil engineering** (2009-2012)

- Goals: Design and development of an intelligent system for labour risk prevention in civil engineering
- Activities: Algorithms design, coding, experimental approach, team leadership and management
- Team: 3 (profiles: 66% data scientists, 33% civil engineers)
- Technologies: Python, Javascript, HTML5, MySQL

2008 **Avante**.

- **Multimedia applications for SME support**
  - Goals: Development of multimedia applications
  - Activities: Team leadership and management
  - Team: 3 (profiles: 50% data scientists, 20% business people)

Education

2014 **PhD in Artificial Intelligence**, *Summa Cum Laude*, Universidad de Almería (Spain).
Dissertation: *Modelling Complex Adaptive Systems with Fuzzy Cognitive Maps*

2000 **PhD in Management Information Systems**, *Summa Cum Laude por unanimidad*, Universidad of Huelva (Spain).
Dissertation: *A systemic approach of Executive Information Systems*

2008 **Master of Computer Science**.
Universitat Oberta de Catalunya (Barcelona, Spain), Final project: Discrete-event simulation with asymmetric process (Honours)

2006 **Bachelor of Computer Science**.
Universitat Oberta de Catalunya (Barcelona, Spain), Final Project: Software engineering of an IF-THEN rules engine (Honours)

1994 **Master and Bachelor of Business Administration**.
Universidad de Huelva (Spain)

Academia

Positions

2012 - **Professor (Catedrático) of Artificial Intelligence**, *Universidad Pablo de Olavide*, Spain.

2019 - **Adjunt Professor of Artificial Intelligence**, *Tech Revolution in Finance*, Instituto de Empresa, Madrid, Spain.

2015- **Research Professor of Artificial Intelligence**, *Univerzita Hradec Králové*, Czech Republic.

2015-2017 **Leverhulme Trust International Network in Grey Systems**, *The Leverhulme Trust*, Coordinator: DeMonfort University.
UPO partner principal investigator: Jose L. Salmeron

2014 - **Senior associate researcher of Artificial Intelligence**, *Universidad Autonóma de Chile*, Chile.

2013 **Visiting Scientist**, *Center for Intelligent Technologies, Department of Cybernetics and AI.*
Technical University of Kosice, Slovak Republic.

2012 **Visiting Scientist**, *Department of Systems and Industrial Engineering.*
The University of Arizona, USA.

2003-2011 **Associate Professor**, *Universidad Pablo de Olavide*, Sevilla.

2001 **Visiting scholar**, *Department of Information Systems and Quantitative Sciences*, USA.
Texas Tech University, USA

Projects

2015-2016 **HHRR computational analysis**, *Regional Government of Andalusia.*
UPO principal investigator: Jose L. Salmeron

2010-2012 **Fuzzy Dynamic Models in Technological Forecasting/Foresighting for supporting public policies**, *Spanish Ministry of Science and Innovation.*
Principal investigator: Jose L. Salmeron

2010-2010 **Usability of Fuzzy Cognitive Maps**, *University of Hradec Kralove, Czech Republic.*
Principal investigator: Jose L. Salmeron

2009-2011 **Decision making processes in autonomous Systems (Rozhodovaci procesy v autonomnich systemech - GACR 402/09/0662)**, *Czech Science Foundation.*
Principal investigator: Karel Mls

2007-2009 **Forecasting/Foresighting techniques for supporting public policies**, *Spanish Ministry of Science and Innovation.*
Principal investigator: Jose L. Salmeron

2008-2012 **ERP systems implementation and maintenance analysis**, *Regional Government of Andalucia (Excellence project).*
Principal investigator: Jose L. Salmeron

Summer 2008 **Visiting Scientist**, *Engineering Design Lab, Department of Mechanical Engineering and Construction.*
University Jaime I, Castellon, Spain.

2005-2008 **ENLACES**, *European Union EQUAL.*
Principal investigator: Jose L. Salmeron

2005-2006 **A foresight analysis for ERP tools selections with Fuzzy Cognitive Maps**, *VR of Research - UPO.*
Principal investigator: Jose L. Salmeron

2003-2004 **A methodological framework for developing ERP solutions specifications**, *VR of Research - UPO.*
Principal investigator: Jose L. Salmeron

2003-2004 **Technological forecasting infrastructure**, *Regional government of Andalusia.*
Principal investigator: Jose L. Salmeron

Scientific publications

Full info at `https://joselsalmeron.github.io/#pubs`

Additional activities

Scientific committes

Full info at https://joselsalmeron.github.io/#research

Awards

- *Six-year research award* 2015-2020, Spanish Ministry of Science and Technology
- *Six-year research award* 2009-2014, Spanish Ministry of Science and Technology
- *Six-year research award* 2003-2008, Spanish Ministry of Science and Technology
- *Six-year research award* 1997-2002, Spanish Ministry of Science and Technology
- *IT mention award* 2000, PCWEEK.
- Included in *Who's Who in Science* since 2005.

Tools

Languages	Python, R, Matlab/Octave, Julia, Scala, Erlang/Elixir, Prolog, Java, C, Javascript, SQL, LaTeX	Tools	Visual Studio Code, JupyterLab, Apache Spark, Azure DevOps, AWS, RStudio, JuliaStudio, Docker, Git, MS Project, Xcode, VirtualBox, Docker, Kubernetes, TeXShop
OS	Mac OSX, MS Windows, Linux	Databases	MongoDB, SQLite, MySQL, PostgreSQL

Languages

Spanish	*Native*	English	*Fluent*