

Part A. PERSONAL INFORMATION

CV date

21/09/2018

First and Family name	Manuel Ruiz Arahal		
Social Security, Passport, ID number	52233140W	Age	52
Researcher numbers	Researcher ID	I-3837-2018	
	Orcid code	0000-0003-0159-0498	

A.1. Current position

Name of University/Institution	U. Sevilla		
Department	Ingeniería de Sistemas y Automática		
Address and Country	Camino de los descubrimientos, s/n ETSI 41092, Spain		
Phone number	E-mail	arahal@us.es	
Current position	Professor	From	2009
Espec. cód. UNESCO	3311.01		
Palabras clave	Modelling, simulation, control, predictive control		

A.2. Education

PhD	University	Year
Ing. Industrial	U. Sevilla	1991
Dr. Ing. Industrial	U. Sevilla	1996

A.3. JCR articles, h Index, thesis supervised...

- 4 research sexenios CNAI (up to 2016)
- 2 PhD thesis under direction
- more than 1600 cites, 175+ cites/year
- more than 20 papers in publications in Q1
- h index 23 (Google)
- 5 books, 4 book chapters
- over 40 JCR publications
- over 50 papers in international conferences

Part B. CV SUMMARY (max. 3500 characters, including spaces)

- Full professor with 25+ year total teaching experience.
- Founding member of ACETI (TIC-201) research group.
- Head of 8 I+D contracts with more than 300.000,00€ managed.
- Best paper award 2010 in IEEE Transactions on Industrial Electronics.
- Best paper award in IET Electric Power Applications, 2010-2011.
- General chairs' recognition award for interactive papers at 48th IEEE CDC, 2009.
- Guest Editor of IET Electric Power Applications Special Issue in "Advances in Predictive Control of Variable-Speed Electric Drives", 2017
- Research objectives:
 - 1 Use of MPC and optimization methods for energy saving applications in particular by means of modeling/identification and simulation.
 - 2 Application of multi-phase IM to energy-related systems.

Some particularly relevant (for this proposal) activities performed by this researcher are cited below. They include papers where the relevant topic has been MIC (modeling, identification and control) applied to energy systems. These items are not included in section C as they belong to a different time-frame.

1. **Ruiz Arahal, Manuel**, Martinez Cirre, Cristina Rogelia, Berenguel Soria, Manuel:
Serial Grey-Box Model of a Stratified Thermal Tank for Hierarchical Control of a Solar Plant.
In: Solar Energy. 2008. Vol. 82. Núm. 5. Pag. 441-451

2. Bordons Alba, Carlos, Fernández Camacho, Eduardo, Tejera, José María, **Ruiz Arahal, Manuel**: Energy saving in a copper smelter by means of model predictive control. Vol. 1. Pag. 63-85. In: Identification and Control, the GAP Between Theory and Practice. Ed. 1. Berlín. Springer-Verlag. 2007. ISBN 978-1-84628-898-2
4. Luque Sendra, Amalia, Alamo Cantarero, Teodoro, **Ruiz Arahal, Manuel**, Limón Marruedo, Daniel: Modeling of a Hybrid Renewable/Fossil Hot Water Production System. 2010 IEEE International Conference on Emerging Technologies and Factory Automation. (ETFA' 2010).
5. Ridao Carlini, Miguel Angel, Fernández Camacho, Eduardo, Bordons Alba, Carlos, **Ruiz Arahal, Manuel**, Alamo Cantarero, Teodoro, et. al.: Consortium Developing Dra Model, Algorithm. In: Oil & Gas Journal. 2005. Vol. 103. Núm. 35. Pag. 78-84
6. Rodríguez Ramírez, Daniel, **Ruiz Arahal, Manuel**, Fernández Camacho, Eduardo: Min-Max Predictive Control of a Heat Exchanger Using a Neural Network Solver. In: IEEE Transactions on Control Systems Technology. 2004. Vol. 12. Núm. 5. Pag. 776-786
7. **Ruiz Arahal, Manuel**, Fernández Camacho, Eduardo, Berenguel Soria, Manuel: Neural Identification Applied to Predictive Control of a Solar Plant. In: Control Engineering Practice. 1998. Vol. 6. Núm. 3. Pag. 333-344

Part C. RELEVANT MERITS

C.1. Publications

1. Rodas, Jorge Esteban, Martín, Cristina, **Ruiz Arahal, Manuel**, Barrero, Federico, Gregor, Raul Igmar, 2017, Influence of Covariance-Based ALS Methods in the Performance of Predictive Controllers With Rotor Current Estimation. IEEE Transactions on Industrial Electronics. Vol. 64. Pag. 2602-2607.
2. Martín Torres, Cristina, Bermúdez, Mario, Barrero, Federico, **Ruiz Arahal, Manuel**, Kestelyn, Xavier, 2017, Sensitivity of Predictive Controllers to Parameter Variation in Five-Phase Induction Motor Drives. Control Engineering Practice. Vol. 68. Pag. 23-31.
3. Martín Torres, Cristina, **Ruiz Arahal, Manuel**, Barrero Garcia, Federico José, Duran Martinez, Mario Javier, 2016, Five-Phase Induction Motor Rotor Current Observer for Finite Control Set Model Predictive Control of Stator Current. In: IEEE Transactions on Industrial Electronics. Vol. 63. Pag. 4527-4538.
4. Martín Torres, Cristina, **Ruiz Arahal, Manuel**, Barrero Garcia, Federico José, Duran Martinez, Mario Javier, 2016, Multiphase Rotor Current Observers for Current Predictive Control: a Five-Phase Case Study. In: Control Engineering Practice. Vol. 49. Pag. 101-111
5. Rodas Benítez, Jorge Esteban, Barrero Garcia, Federico José, **Ruiz Arahal, Manuel**, Martín Torres, Cristina, Gregor Recalde, Raul Igmar, 2016, On-line Estimation of Rotor Variables in Predictive Current Controllers: A Case Study using Five-phase Induction Machines. In: IEEE Transactions on Industrial Electronics. 2016. Vol. 63. Pag. 5348-5356.
6. **Ruiz Arahal, Manuel**, Barrero Garcia, Federico José, Gil Ortega, Manuel, Martín Torres, Cristina, 2016, Harmonic Analysis of Direct Digital Control of Voltage Inverters. In: Mathematics and Computers in Simulation. 2016. Vol. 130. Pag. 155-166.
7. Duran Martinez, Mario Javier, González Prieto, Ignacio, Bermúdez Guzmán, Mario, Barrero Garcia, Federico José, Guzmán Jiménez, Hugo Mauricio, **Ruiz Arahal, Manuel**,

2016, Optimal Fault-tolerant Control of Six-phase Induction Motor Drives with Parallel Converters. In: IEEE Transactions on Industrial Electronics. Vol. 63. Pag. 629-640

8. Mena, Rafael, Rodriguez Diaz, Francisco, Castilla Nieto, Maria del Mar, **Ruiz Arahal, Manuel**, 2014, A prediction model based on neural networks for the energy consumption of a bioclimatic building. In: Energy and Buildings. Vol. 82. Pag. 142-155.

9. Castilla Nieto, Maria del Mar, Alvarez Hervas, Jose Domingo, Ortega Linares, Manuel Gil, **Ruiz Arahal, Manuel**, 2012, Neural network and polynomial approximated thermal comfort models for HVAC systems. In: Building and Environment. Vol. 59. Pag. 107-115.

10. **Ruiz Arahal, Manuel**, Núñez Reyes, Amparo, Alvarado Aldea, Ignacio, Rodriguez Diaz, Francisco, 2009, Agrupaciones de Modelos Locales con Descripción Externa: Aplicación de una Planta de Frío Solar. In: Revista Iberoamericana de Automática e Informática Industrial. Vol. 6. Pag. 51-62.

C.2. Research projects and grants

1. DPI2016-76144-R, Extensión de la Zona de Operación Segura de los Variadores Eléctricos de Inducción de 5 Fases, MEC Plan Estatal 2013-2016 Retos, IP= F. Barrero (U. Sevilla), from 30-12-2016 to 29-12-2018, budget: 93.800€.

2. DPI2015-70973-R, Optimización de la Producción de Frío Mediante Sistemas de Almacenamiento de Energía, MEC Plan Estatal 2013-2016 Retos, IP=Manuel Gil Ortega Linares (U. Sevilla), from 01-01-2016 to 31-12-2018, budget: 203.000€.

3. DPI2013-44135-R, Estimación y Predicción Distribuida de la Radiación para Control de Campos Solares, MEC Plan Estatal 2013-2016 Retos, IP=Francisco Rodríguez Rubio (U. Sevilla), from 01-01-2014 to 31-07-2017, budget: 147.000€.

4. DPI2012-37580-C02-02, Optimización y Control Robusto Multivariable de Sistemas de Refrigeración, MEC Plan Nacional del 2012, IP=Manuel Gil Ortega Linares (U. Sevilla), from 01-01-2013 to 31-12-2015, budget: 152.000€.

5. P07-TEP-02720, Control y optimización de sistemas híbridos de energías renovables, Junta de Andalucía, Proyectos de Excelencia de la Junta de Andalucía, IP=Eduardo Fernández Camacho (U. Sevilla), from 31-01-2008 to 31-12-2012, budget: 375.000€.

C.3. Contracts

1. Medida Coherente de Caudal 1 (PI-1071A/2013) and 2 (PI-1081/2013), EMASESA, IP=**Manuel Ruiz Arahal** (U. Sevilla), from 01-01-2013 to 31-12-2013, budget: 16.800€.

2. eFleet - Inteligencia y eficiencia energética en la gestión integral de flotas de vehículos eléctricos. (PI-1157/2013), AZVI SA, IP=**Manuel Ruiz Arahal** (U. Sevilla), from 01-09-2013 to 31-01-2015, budget: 98.000€.

3. Planta de almacenamiento térmico TES PS10 (0345/0105), Abengoa Solar New Technologies, IP=**Manuel Ruiz Arahal** (U. Sevilla), from 13-04-2009 to 13-04-2012, budget: 212.000€.

4. Diseño de sistema automático de control para prototipo de laboratorio de laboratorio de intercambiadores de presión (PI-0384/2008), PREXTOR SYSTEMS SL, IP=**Manuel Ruiz Arahal** (U. Sevilla), from 19-12-2008 to 18-12-2009, budget: 6.300€.

C.4. Patents

Davila Martin, Javier, Ruiz del Olmo, Fernando, Ruiz Arahal, Manuel: Baterías Submarinas de Par Ajustado. Patente de invención, Propiedad industrial. Solicitud: 2009-02-09

C.5 PhD Thesis

Gregor Recalde, Raul: Aportaciones al Control de Corriente de Máquinas de Inducción de Seis Fases con Doble Devanado Trifásico Independiente y Asimétrico. Presented 2010

Martín Torres, Cristina: Aportaciones al control de máquinas pentafásicas. To be presented in 2019.

C.6 Scientific societies

2008-2013 Member of IEEE-CSS Technical Committee on System Identification and Adaptive Control