



AYUDAS RAMÓN Y CAJAL CONVOCATORIA 2015

Turno de acceso general

Nombre: JIMENEZ CELORRIO, SERGIO
Referencia: RYC-2015-18009
Área Científica: Ciencias de la Computación y Tecnología Informática
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Título:

Computer Science, artificial intelligence

Resumen de la Memoria:

My research focuses on finding innovative integrations of machine learning and automated planning to address complex decision making problems. My aim is developing integrative solutions that cancel out the weaknesses and improve the strengths of both Artificial Intelligence (AI) paradigms. My recent work on this topic opens the door to novel approaches for the automated generation of complex controllers and programs.

My top 5 scientific contributions and associated publications are:

1. Effective computation of generalized plans and their application to improve AP scalability, [De La Rosa et al., 2008], [De la Rosa et al., 2011],[Jiménez and Jonsson, 2015].
2. Learning action performance models and compilations of these models to improve plan execution [Jiménez et al., 2006], [Lanchas et al., 2007],[Jiménez et al., 2008], [Jiménez et al., 2013].
3. The state-of-the-art solver for temporal planning tasks [Jiménez et al., 2015].
4. The organization of three editions of the International workshop on Planning and Learning and the organization of the 7 th International Planning Competition (IPC) [Jiménez et al., 2012], [Coles et al., 2012], [López et al., 2013], [López et al., 2015]. All these events took place within the International Conference on Automated Planning and Scheduling (ICAPS). This is the main international conference on AP and is ranked as A+ by the CORE conferences rank and with h5-index 25 at Google Scholar.
5. Program Committee at the last two editions of the International Joint Conference on Artificial Intelligence (IJCAI). This is one of the top conferences in AI, ranked as A+ by the CORE rank and with h5-index 43 at Google Scholar.

Resumen del Currículum Vitae:

I obtained a European Ph.D that received the distinguished Thesis Award at the computer science department of Universidad Carlos III de Madrid and, from 2004 to 2013, I worked there as a member of the 'Planning and Learning research group' led by Prof. Dr. Daniel Borrajo. In 2013 I obtained a ' Juan de la Cierva' post-doc and joined the 'Artificial Intelligence Group', led by Prof. Dr. Hector Geffner, at the Department of Technology of the Universitat Pompeu Fabra de Barcelona.

I have participated in more than 10 research projects related to automated planning and machine learning including 3 projects funded by the National Research Plan. I completed four research stays (3 pre-doc and 1 post-doc) at international research groups dedicated to automated planning and machine learning. I am author of 6 scientific papers in JCR journals, 3 book chapters and more than 10 scientific papers at international conferences (4 of them with the maximum rate at the CORE ranking). I also review for major AI conferences and journals like IJCAI, AAAI and AIJ.

I am organizer of three editions of the International workshop on Planning and Learning and organizer of the 7th International Planning Competition, being also responsible for the planning and learning track.



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Nombre: AGUDO TORRES, RUBEN
Referencia: RYC-2015-17280
Área Científica: Biología Fundamental y de Sistemas
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Título:

Directed evolution of proteins

Resumen de la Memoria:

I am a protein engineer interested on manipulation and modification of enzymes by directed evolution in order to obtain new catalysts with non-natural or improved abilities. During my PhD in the laboratory of Professor Esteban Domingo at Centro de Biología Molecular "Severo Ochoa" (CBMSO) I used enzymological and cell culture approaches to study the dynamics and molecular basis of genetic variability in RNA viruses. Furthermore, thanks to the outstanding of my excellent scientific results, I earned an internship awarded by the Universidad Autónoma de Madrid to stay of three months in the laboratory of Professor Nuria Verdaguer (Institut de Biologia Molecular de Barcelona, IBMB) where I could solve the crystal structure of several mutant proteins that I obtained during the development of my research.

Due to my interest in enzymatic reactions and evolution of proteins, in 2011 I moved to the laboratory of Prof. Dr. Manfred T. Reetz in Germany (Marburg University and Max Plank Institute), a worldwide prominent figure in the field of biocatalyst engineering. There, I had the opportunity to expand my knowledge of enzymology working on the directed evolution of potentially useful industrial biocatalysts such as enoate reductase, Baeyer-Villiger monooxygenase and thermostable dehydrogenases. Furthermore I also acquired a strong background in biocatalyst reaction engineering and process optimization.

Currently, I am involved in an European project that I recently awarded (EVOPRIMPOL) consisting in the depth structure-function study of PrimPol, a novel protein capable of performing both priming and polymerase activities in human cells and involved in tolerance to DNA damage. Due to variety activities that this protein displays, the novelty of its discovery and the absence of a solved crystal structure, study of PrimPol can not be accomplished using standard site-directed mutagenesis protocols and further characterization. Thus EVOPRIMPOL is a novel, fast and reliable approach to study the role of critical amino acids involved in the different activities shown by the enzyme based on the in vitro directed evolution of PrimPol gen. This project integrates the research lines developed in my predoctoral stage and my postdoctoral experience and reinforces my professional maturity and capacity for independent thinking, since I am leading my own research proposal. Likewise I deal with daily difficulties related to both research objectives and project management.

As new approach to face this project, I have devised a novel method to select PrimPol residues that will be randomized based on the evolutionary analysis of a given protein family to identify sites which are probable to affect the activity of an enzyme, producing a new branch in its evolutionary tree. Obtaining a Ramón y Cajal fellowship would allow me to launch this novel research line useful to evolve any kind of enzymes (specifically, I am especially interested in directed evolution of antibodies as well as tailoring different proteins from extremophile microorganisms and parasites towards biomedical and pharmaceutical applications). Besides, this possibility would represent a step forward in my research career facilitating the opportunity to establish me as independent researcher in Spain, where the promising and expanding field of directed evolution of proteins is highly underrepresented.

Resumen del Currículum Vitae:

**Publications:

- 24 SCI publications including 2 reviews.
- 1 book chapter.
- Total citations: 509
- Total citations excluding self citations: 449
- Average citations per year during the last 5 years (2011-2015): 76
- Publications in the top tier journals (Q1) 15; I am first author in 7 of them.
- First author papers: 10
- h-index: 14

Granted Patents:

- Authors: Domingo, E., Agudo, R., Tejero, H., Cuevas, S., Perales C.
- Title: Tratamiento Antiviral (Antiviral Treatment).
- Patent number: P200930482, 20th July 2009 (First application).

Participation in European and National Research Projects:

- 4 national and 1 european funded research projects.

Conference Contributions:



MINISTERIO
DE ECONOMÍA, INDUSTRIA
Y COMPETITIVIDAD



DIVISIÓN DE PROGRAMACIÓN
Y GESTIÓN ECONÓMICA Y
ADMINISTRATIVA

SUBDIVISIÓN DE
PLANIFICACIÓN Y GESTIÓN
ADMINISTRATIVA

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- 5 international and 1 national conferences with 5 oral presentations and 4 posters.

Awards and personal recognition:

- 05/2015 Marie Curie postdoctoral Individual Fellowship from the Horizon 2020 Programme of the European Commission.
- 10/2009 Special Thesis prize awarded by Universidad Autónoma de Madrid.
- 05/2008 Internship awarded by "Universidad Autónoma de Madrid" to work in the laboratory of Profesor Nuria Verdaguer.
- 10/2004 Ph.D. student fellowship awarded by Comunidad Autónoma de Madrid.
- 08/2001 Student fellowship awarded by Educational Science Ministry to acquire research experience in the Immunological Unit of Microbiology National Centre of Instituto de Salud Carlos III.