Ricardo Omar Chavez-Garcia

Born in Oaxaca, Mexico

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Institut des Systèmes Intelligents et de Robotique

Current job: *Post doctoral Researcher at Architectures and Models*

for Adaptation and Cognition Research Group

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RESEARCH INTERESTS

I am interested on proposing and developing intelligent systems for robotic platforms that interact with the real world. I work on stochastic approaches for robotic perception and interaction. My research perspectives concern the environment understanding and learning of sensorimotor representations for decision-making tasks.

RESEARCH AND DEVELOPMENT EXPERIENCE

2015–Current Research and Development of a Cognitive Perception System for Indoor Robotics — Institut des Systèmes Intelligents et de Robotique (ISIR)

Developmental Robotics
 Proposal and development of an active cognitive perception system for modeling the environment by integrating action and perception processes. RoboErgoSum - Self Aware Robots, is a four year project funded by the French National Research Agency ANR which objective is to explore artificial conscienceness in robotics. roboergosum.isir.upmc.fr

2011–2014 Responsible of the Perception process inside the INTER-ACTIVE (ACCIDENT AVOIDANCE BY ACTIVE INTERVENTION FOR INTELLIGENT VEHICLES) IP EUROPEAN PROJECT

Autonomous Vehicles
 Proposal and development of a multi-sensor fusion solution software for a vehicle frontal object perception application. It involved: outdoor environment mapping; detection, tracking and classification of multiple objects of interest in different driving scenarios. The solution was part of a whole automotive application involving several car manufacturers and suppliers. www.interactive-ip.eu

2012–2014 Responsible of the Robotic Platforms — MACHINE LEARNING TEAM (AMA) - GRENOBLE INFORMATICS LABORATORY (LIG)

Robotic Platforms
 Development of robotic drivers and sensor (mono-camera and 2D lidar scanner) data processing modules for Wifibot and Nao robotic platforms.

EDUCATION

2010–2014 University of Grenoble 1 (Université Joseph Fourier), Grenoble, France

Ph.D. in Mathematics and Computer Science
Doctoral School: Mathématiques, Science et Technologies de l'Information
Thesis: *Multiple Sensor Fusion for Detection, Classification and Tracking of Moving Objects in Driving Environments*
Description: Two multi-sensor fusion approaches were proposed to include

classification information from different sources of evidence in a whole perception solution. Uncertainty and imprecision from sensor measurements, object detections and object classification process were considered as key factors to improve the final perception output.
Thesis Advisor: Olivier Aycard, Ph.D.

2008–2010 National Institute of Astrophysics, Optics and Electronics, Puebla, Mexico

Master in Computer Science

Thesis: *Re-ranking of retrieved images using a combination of visual and textual features*
Description: A multiple modal approach was proposed to represent images using textual and visual features. This approach uses a multi-modal representation to re-rank a list of retrieved images by applying Markov Random Fields.
Thesis advisors: Manuel Montes-y-Gomez, Ph.D. and Luis Enrique Sucar, Ph.D.

2001–2006 Technological University of Mixteca, Oaxaca, Mexico

Bachelor of Science

Computer Engineering
Thesis: *Coordinated Construction of Ontologies for Documents Ranking*
Description: Development of a software infrastructure for building knowledge repositories using ontological representations.
Thesis advisor: M. Auxilio Medina, Ph.D.

PUBLICATIONS

Discovering and Manipulating Affordances. R. Omar Chavez-Garcia, Mihai Andries, Raja Chatila and Pierre Luce-Vayrac. The 2016 International Symposium on Experimental Robotics (ISER 2016). *-Accepted-*.

Discovering Affordances Through Perception and Manipulation. R. Omar Chavez-Garcia, Raja Chatila and Pierre Luce-Vayrac. 2016 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2016). *-In review-*.

Multiple Sensor Fusion and Classification for Moving Object Detection and Tracking. Ricardo Omar Chavez-Garcia, Olivier Aycard.IEEE Transactions on Intelligent Transportation Systems, vol. 17, issue 2, pp. 252-534. September 2015.

Fusion at Detection Level for Frontal Object Perception. R. Omar Chavez-Garcia, Trung-Dung Vu, Olivier Aycard and Fabio Tango. IEEE Intelligent Vehicles Symposium (IV), 2014

Research Report on Sensor Data Fusion. Anastasia Bolovinou, Angelos Amditis, Nikos Floudas, Christina Kotsiourou, Trung-Dung Vu, R. Omar Chavez-Garcia, Olivier Aycard, Fabio Tango, Mario DallaFontana, Chris Benson, Nils Appenrodt, Markus Schutz, Sebastian Pangerl, Florian Janda, Erich Fuchse, Lali Ghosh, Mirko Meuter, Daniel Schuck and Christian Nunn. 7th Framework Programme ICT-2009.6.1: ICT for Safety and Energy Efficiency in Mobility Grant Agreement No. 246587 Large-scale Integrated Project. InteractIVe Project Consortium, 2013

Fusion framework for moving-object classification. R. Omar Chavez-Garcia, Trung-Dung Vu, Olivier Aycard and Fabio Tango. 16th International Conference on Information Fusion (FUSION), pp. 1159-1166, 2013

Multimodal Markov Random Field for Image Reranking Based on Relevance Feedback. R. Omar Chavez-Garcia, Hugo Jair Escalante and Luis Enrique Sucar. ISRN Machine Vision, vol. 2013, February 2013.

Frontal Object Perception Using Radar and Mono-Vision. R. Omar Chavez-Garcia, Julien Burlet, Trung-dung Vu and Olivier Aycard. IEEE Intelligent Vehicles Symposium (IV), pp. 159-164, 2012

Using a Markov Random Field for Image Re-ranking Based on Visual and Textual Features. R. Omar Chavez-Garcia, Manuel Montes and L. Enrique Sucar. Computacin y Sistemas Vol. 14, No. 4, 2011.

A Probabilistic Method for Ranking Refinement in Geographic Information Retrieval. Esau Villatoro-Tello, R. Omar Chavez-Garca, Manuel Montes-y-Gmez, Luis Villaseor-Pineda, L. Enrique Sucar. Procesamiento de Lenguaje Natural, No. 44, pp. 123-130, April 2010.

Image Re-Ranking Based on Relevance Feedback Combining Internal and External Similarities. R. Omar Chavez-Garcia, Manuel Montes-y-Gómez, Luis Enrique Sucar. In proceeding of: Proceedings of the Twenty-Third International Florida Artificial Intelligence Research Society Conference. May 19-21, 2010, Daytona Beach, Florida.

RDF-Based Model For Encoding Document Hierarchies. Ma. Auxilio Medina J., Alfredo Sanchez and R. Omar Chavez-Garcia. Proceedings of the 17th International Conference on Electronics, Communications and Computers (CONIELECOMP). Puebla, Mexico, 2007.

Construction, Implementation and Maintenance of Ontologies of Records. Ma. Auxilio Medina, Alberto Chavez Aragon, and R. Omar Chavez-Garcia. In Proceedings of the Fourth Latin American Web Congress (LAWEB). Puebla, Mexico, May 2006.

COPYRIGHTED SOFTWARE SOLUTIONS

2014   Multi-sensor Frontal Object Perception · S105 - FOP - *Frontal Objects Perception (P032)* - IDDN.FR.001.180016.000.S.C.2014.000.20700

2014   Multi-sensor Moving Object Classification · S106 - MOC - *Moving Objects Classification (P033)* - IDDN.FR.001.180017.000.S.C.2014.000.20700

CONFERENCES AND PRESENTATIONS

2014   Contributions to Perception for Intelligent Vehicles · National Institute of Astrophysics, Optics and Electronics, Puebla, Mexico

2013   Fusion Framework for Moving-object Classification · 16th International Conference on Information Fusion (FUSION), Istanbul, Turkey

2012   Frontal Object Perception Using Radar and Mono-Vision · IV Intelligent Vehicles Symposium, Alcalá de Henares, Spain

2010   Image Re-ranking Method Based on a Multimodal Markov Random Field · Automatic Image Annotation and Retrieval Workshop (AIARW), Puebla, Mexico

2006   Construction, Implementation and Maintenance of Ontologies of Records. · Fourth Latin American Web Congress, Puebla, Mexico

COMPUTER SKILLS

Programming Languages   C++, Python, Shell scripts,R, PHP, Java

Laboratory Platforms   ROS, Matlab

COMMUNICATION SKILLS

Languages   ENGLISH · Fluent

FRENCH · Intermediate (conversationally fluent)

SPANISH · Mothertongue

TEACHING ACTIVITIES

Fall, 2016   Integrative project "Stereo Vision Module for Parallel Architectures" for Master1 degree.

Co-supervisor   Proposal and supervision of a Software-Hardware module for acquisition and

processing of stereo data. Four Master degrees were involved: ISI, I4, SAR and CIMES

Spring, 2015   Master2 internship: Sensori-motor representations for interactive robots

Co-supervisor   Association of perceptual elements from visual sensors and proprioceptive data to create sensori-motor representations.

Fall, 2012   Informatique instrumentale et multimédia · Université Joseph Fourier

Teaching assistant   Theory of Algorithms and Introduction to Programming for undergraduate students.

AFFILIATIONS AND AWARDS

April, 2016   Member of the IEEE Technical Committee on Cognitive Robotics — IEEE Robotics and Automation Society

January, 2014   Member of The International Society of Information Fusion

November, 2010   Best Master in Science thesis on Artificial Intelligence Award

Granted by Mexican Society for Artificial Intelligence, for the thesis: 'Re-ranking of retrieved images using a combination of visual and textual features'

November, 2009   Best Student in Master in Computational Sciences Program Award

Granted by the National Institute of Astrophysics Optics and Electronics, for an outstanding academic performance

November, 2008   Master in Science Scholarship

Scholarship by the Mexican National Council of Science and Technology (CONA-CyT)

ACADEMIC ACTIVITIES

Invited reviewer for *IEEE Transactions on Intelligent Transportation Systems 2016*

Invited reviewer for *The Intelligent Vehicles Symposium (IV2016)*

Invited Program Committee Member for *The International Symposium on Intelligent Computing Systems 2016*

Invited reviewer for *The Seventh International Conference on Social Robotics 2015*

Invited reviewer for *The IEEE 18th International Conference on Intelligent Transportation Systems 2015*

Invited reviewer for *The Intelligent Vehicles Symposium (IV2015)*

Invited reviewer for *The Intelligent Vehicles Symposium (IV2014)*