Agustin Alberto Ortega-Jimenez

Objective: To become a high level research scientist in the field of computer vision, artificial intelligence, and robotics for applying my knowledge into find real world solutions for technological problems.

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1.- Education

Ph.D
September 2007– Present

PhD in Control, Vision and Robotics. I'm a phD student, working in the Institut de Robótica i Informática Industrial especially for calibration of camera networks, segmentation of planes in point clouds, and recognize dynamics objects using mobile robots at the Universitat Politécnica de Catalunya, in Barcelona spain.
Thesis title: Perception and interpretation of dynamic scenarios using lidar data and images.

MSc.
August 2003 - September 2005

Master of Sciences in Computer Science, National Institute of Astrophysics, Optics, and Electronics (Mexico) .
Thesis: Tracking extended object using 3d models:

This thesis project presents a computer vision system to track and to recognize 3D objects with a single camera. The tracker is designed for rigid models; the recognition provides the pose and correspondence with the image features and the model. The system does not present any constrain in the movement of the camera or the object. It is estimated the model position using the particle filter. The methods can be used in visual servoing systems or robotics.

BSc..
August 1998-July 2004

Computer Science Engineering, Computer Science School, Autonomous University of Puebla. (Mexico). GPA 9.1/10. **First class honours**.
Thesis: Tracking multiple birds by means digital image analysis

This thesis project uses computer vision techniques and Kalman filter to track multiple birds. The method estimates the bird's position and speed on the image allowing occlusion, the system is able to track multiple birds that appear in the scene.

2.- PROFESSIONAL/ RESEARCH EXPERIENCE

Oct. 2011-Jul 2012

Technical Support Researcher,

Institute: Institut de Robòtica i Informàtica Industrial.
Place: Barcelona, Spain.

The job activities include research and software develops for calibrating an outdoor camera network and robot sensors in the institute. The institute has 3 mobile robots used for research, the robots need to be calibrated, also the need arises of having perception methods specially designed for outdoor. The sensors used in the research are cameras and a lidar. The experiments are performed in lab called Barcelona RobotLab that has 21 cameras.

Jun. 2006-Aug. 2007

Researcher/Developer

Institute: Instituto de Investigación y Desarrollo Tecnológico de la Armada de Mexico(INIDETAM),.
Place: Veracruz, Mexico,

The job consists in the development of research projects for the Mexican Army. Principally, the development was applied on research for navigation and shooting range simulators, the second one applying computer vision techniques for identify shoot by means segmentation.

Sep. 2005-Feb. 2006.

Software Developer

Institute: Instituto Nacional de Astrofísica, Óptica y Electrónica (INAOE).
Place: Puebla, Mexico.

The activities include development of research projects in the National Institute of Astrophysics, Optics, and Electronics, Mexico. It was development a reconstruction system using stereo camera. The program was used for monitoring the fly behaviour during the life besides tracking the conduct and performance.

Jan. 2003 – May 2003

Software Develoer

Institute: Instituto Nacional de Astrofísica, Óptica y Electrónica (INAOE).
Place: Puebla, Mexico.

Activities include development of computer vision algorithms for tracking and segmenting, Principally the objective job wa for development of bachelor thesis algorithms.

Jan. 2002 – Aug. 2002.

Software Developer

Institute: Secretaria de Finanzas y credito Publico,
Place: Puebla, Mexico.

The jobs activities were data base programming designed especially for the institute.

3.- PARTICIPATION IN RESEARCH PROJECTS

2009-2012

AGAUR SGR Vision and Intelligent Systems Group (VIS)

Head researcher Dr. Alberto Sanfeliu
Institute Institut de Robotica i Informatica Industrial (IRI)
place Barcelona, Spain.

The main objective of the Artificial Vision and Intelligent Systems (VIS) is to do basic and applied research on the development of intelligent systems capable of interacting autonomously and in an ubiquitous manner with their environment. Said systems should be able to perceive reason, plan, and act and learn from previous experience. The group actively works in topics such as segmentation and robust labelling of color images, pattern recognition, illumination and pose-

invariant object recognition and learning, people and objects tracking, biometrics, document analysis, automatic classification and diagnosis of medical images, navigation for autonomous robots, simultaneous localization and mapping (SLAM) in robotics, and man-machine interaction.

2012 ***AIN-IRI: Detección de obstáculos para robots aéreos por medio de técnicas ópticas***

Head researcher Dr. Juan Andrade Cetto
Institute Institut de Robotica i Informatica Industrial (IRI)
place Barcelona, Spain

Private research contract with the Asociación de Industrias de Navarra. The goal of this project is to develop techniques for computing contact times, or collision times for autonomous aerial vehicles (AUV's) using computer vision.

2008-2011 ***Perception and action under uncertainty***

Head researcher Dr. Juan Andrade Cetto
Institute Institut de Robotica i Informatica Industrial (IRI)
place Barcelona,

The goal of this project is to provide a theoretical foundation of the relation between perception and action in the presence of uncertainty. The main outcome of the project will be novel scientific contributions on Bayesian estimation applied to robotics problems with large state spaces. In particular, the project will produce: novel uncertainty parameterizations that allow efficient inference, new probabilistic hypotheses testing strategies with respect to information load, new active exploration paradigms for scene and object model acquisition, and novel pose estimation algorithms.

2006-2009 ***Ubiquitous Networking Robotics in Urban Settings***

Head researcher: Dr. Alberto Sanfeliu
Institute: Institut de Robotica i Informatica Industrial (IRI)
Place: Barcelona, Spain.

The general objective of this project was the development of new ways of cooperation between network robots and human beings and/or the environment in urban areas, in order to achieve efficiently tasks that in the other way can be very complex, time consuming or too costly. The focus of the project was in urban pedestrian areas, an important topic in Europe where there exists a growing interest in reducing the number of cars in the streets and improving the quality of life. Network robots can be an important instrument to address these issues in the cities.

2005-2008 ***Tactital simulator of the Mexican Army***

Head researcher Dr. Captain Miguel Alvarado Juarez
Institute: Mexican Army
Place: Veracruz, Mexico.

The purpose of the project is to have a tool to train future officials in the Mexican army for tactical actions before manning a real boat. The simulator works with different kinds of boats, and submarines simulating the effects of sensors such as radars, and sonars.

My participation in this project was the development of algorithms to simulate boat, submarines, sensors, and military weapons.

2006-2007

Virtual shooting range

Head researcher: Dr. Captain Miguel Alvarado Juarez
Institute: Mexican Army
Place: Veracruz, Mexico.

The project objective is to create a simulator of the shooting range with different arms used in the Mexican army. Therefore allow to the naval officials extend and make more efficient the training. My participation was to apply computer vision methods to simulate and evaluate the score of the user, as well as calibration of cameras and projectors to acquire the data information.

2004-2005

Missile Naval

Head researcher Dr. Leopoldo Altamirano Robles
Institute Instituto Nacional de Astrofisica Optica y Electronica (INAOE),
Place Puebla, Mexico.

The Mexican army seeks to eliminate dependence on foreign supplies by developing their own arms. Therefore they proposed develop an unmanned vehicle with applications other than military ones. I have participated in the study for the development of this unit, and developing during my master thesis of computer vision method to identify rigid 3D objects.

2005

Studying the Behaviour of Mexican Fruit Fly

Head researcher Dr. Leopoldo Altamirano Robles
Institute Instituto Nacional de Astrofisica Optica y Electronica (INAOE),
Place Puebla, Mexico

The project proposed a study of the Mexican fruit fly to control its reproduction and plagues. The idea was to monitor the complete activities tracking the fly to know their habits in alimentation and resting using computer vision. I participated in using stereo systems to reconstruct the fly in 3D and know its position in the 3D space.

2003-2004

Garfio 1.0 fire control director

Head researcher Dr. Leopoldo Altamirano Robles
Institute Instituto Nacional de Astrofisica Optica y Electronica (INAOE),
Place Puebla, Mexico

This project had as principal objective to develop a surveillance sensor and automatic shooter to detect objects in the sea considering adverse weather condition. The project uses computer vision algorithms and control.

My participation was principally to finish my bachelor's thesis in computer science using computer vision methods in collaboration with BUAP and INAOE.

4.- SCHOLARSHIPS

Oct. 2007 – Sep. 2011	***Scholarship for Abroad Studies,*** Mexican Council of Science and Technology (CONACYT), Mexico.
Aug. 2003 – Sep. 2005	***Scholarship for Master Studies***, Mexican Council of Science and Technology (CONACYT), Mexico.
May-August 2003	***Entry level master studies financial aid***, CONACYT-INAOE, Mexico.

5.- AWARDS

Ad honorem, Benemérita Universidad Autónoma de Puebla (BUAP), Honorable Mention to obtain the Bachelor degree.

Award in Master Studies Instituto Nacional de Astrofísica, Óptica y Electrónica (INAOE) in the Preparatory curse to be accepted in the institute.

Award in project participation, Instituto de Investigación y desarrollo tecnológico de la armada de México (INIDETAM).

6.- LANGUAGES

Spanish	1st Language	Mother tongue.
English	2nd Language	Fluent: speaking, good: listening, good: writing.
French	3er Language	Basic.

7.- GENERAL SKILLS (SOFTWARE AND HARDWARE)

Summary: ***Advanced Programming Languages*** (Advanced in C, C++, Python and Java), ***Computer Vision*** (algorithms, method, and OPENCV), Robotics software(***ROS, YARP), Point cloud algorithms(Point Cloud Library)***, ***Robotics*** (Mobile robots).

SOFTWARE

Programming: Visual Basic, SQL, C++, Pascal, Java,Javascript,HTML, Delphi, Builder C++, Tcl/Tk, Visual C++/C#, Perl, Prolog, Latex, Kdevelop, OpenCV, ROS(Robot Operating System), YARP(Yet Another Robot Platform),QT, Python

Knowledge: UML Design, Image Processing,Computer Networks ,Hardware/software Maintenance,,Matlab, Maple, Ubuntu, Windows 98/XP/2000/Vista/7, Windows server

HARDWARE

Cameras (Flea, Bumblebee) programming for computer vision C++.
Laser(knowledge) : Hokuyo, Leuze.
Mobile platform(knowledge): Segway rpm200 and rmp400,
Computer assembly and maintenance.

8.- PUBLICATIONS

A. Ortega and J. Andrade-Cetto. Segmentation of dynamic objects from laser data. In Proc. European Conference On Mobile Robots, Orebro, Sweden, Sept. 2011.

A. Ortega, J. Andrade-Cetto, Segmentation of dynamic objects from low acquisition rate range data (poster) ENS/INRIA Visual Recognition and Machine Learning Summer School, Paris France, 2011.

J. Andrade-Cetto, **A. Ortega** E. Teniente, E. Trulls, R. Valencia, and A. Sanfeliu. Combination of distributed camera network and laser-based 3d mapping for urban service robotics. In Workshop on Network Robots Systems IEEE/RSJ Conf. Intell. Robots Syst., St. Louis, MO, USA, Oct. 2009.

A. Ortega, B. Dias, E. Teniente, A. Bernardino, J. Gaspar, and J. Andrade-Cetto. Calibrating an outdoor distributed camera network using laser range finder data. In Proc. IEEE/RSJ Conf. Intell. Robots Syst., St. Louis, MO, Oct. 2009.

A. Ortega, I. Haddad, and J. Andrade-Cetto. Graph-based segmentation of range data with applications to 3D urban mapping. In Proc. European Conference On Mobile Robots, Mlini/Dubrovnik, Croatia, Sept. 2009.

A. Ortega Seguimiento de objetos rígidos usando información 3D, Eae Editorial Acad MIA Espa Ola, 2012 8192 ISBN: 978-3-8484-5569-0, 2012

A. Ortega and L. Robles. Estimating the motion of 3D objects using the particle filter. In 6th Research Encounter, National Institute of Astrophysics, Optics and Electronics, 2005.

A. Ortega and L. Robles. Tracking extended object using 3D models. Master's thesis, National Institute of Astrophysics, Optics and Electronics, 2005.

A. Ortega, L. Robles, M. Martin, and I. Olivera. Seguimiento de múltiples aves mediante análisis digital de imagenes. Bachelor's thesis Buap. 2002.

9. COURSES

2011	International conference on computer Vision, Barcelona, Spain.
2011	ENS/INRIA Visual Recognition and Machine Learning Summer School Paris France.
2010	Good Experimental Methodology in Robotics and Replicable Robotics Research, Robotics: Science and Systems (RSS), Zaragoza, Spain.
2010	Workshop RGB-D: Advanced Reasoning with Depth Cameras, Robotics: Science and Systems (RSS), Zaragoza, Spain.
2010	Learning Robots: Bayesian and Active Learning, Vilanova i la Getru, Catalunya, Spain. Universitat Politècnica de Catalunya
2009	International Computer Vision Summer School (ICVSS), Sicily, Italy.
2004	Iberoamerican Congress on Pattern Recognition (CIARP), Techniques of identification and tracking of objects and humans in mobile robots, National Institute of Astrophysics, Optics, and Electronics, Mexico.
2002	Mantenimiento de Redes de Computadoras, Autonomous University of Puebla, México
2001	8a Semana de la Estadística, Autonomous University of Puebla , Mexico.
2001	C++ Builder , Autonomous University of Puebla, Mexico
2001	Introducción a las Redes de Computadoras, Benemérita Universidad Autónoma de Puebla, México.

11.-INTERSHIPS

January 2009 Instituto Superior Técnico (IST), Lisbon, Portugal, Stay, working in associating with Jose Gaspar and Alexandre Bernardino.

10.-REVIEWS

I have been co-reviewer in the following conferences:

IEEE I**nternational Conference on Intelligent Robots and Systems (ICRA) 2013.**

IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) 2012.

IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) 2011

REFEREES

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