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Career Goal

Use machine learning and artificial intelligence to narrow the gap between robotics and the real world.

Summary of Qualifications

- Experience in multidisciplinary research (Mobile Robotics, Machine Learning methods for time series modelling and analysis and pattern recognition, Artificial intelligence, Sensor systems)
- Experience writing project proposals and papers.
- Successful and comfortable working in and leading research teams.

Research Interests:

Robotics, Machine learning, Artificial intelligence. (Autonomous navigation, Learning by demonstration, Reinforcement learning, Simultaneous Localization and Mapping, Decision and Planning)

Education:

- B.Sc., Mechatronic Engineering, Universidad Militar Nueva Granada, GPA: 3.01/4.0, Bogotá–Colombia December 2006.

Research Experience:

- **Research Programmer (Current)** July 15 2009.
Carnegie Mellon University - Robotics Institute
Auton Lab , Pittsburgh - United States
Areas of research: Time series analysis, pattern recognition, sound recognition, Hidden Markov Models
Projects:
 - Localisation of Leatherback and Loggerhead turtles nests using GPR radargrams (in collaboration with Disney)
 - Sound classification using Hidden Markov Models (Joint project CMU and Mobile Fusion Inc.)Supervisor: Artur Dubrawski.
- **Research Visitor** February 1 – May 31, 2009.
Carnegie Mellon University - Machine Learning Department – Robotics Institute
Select Lab - Auton Lab , Pittsburgh - United States
 - Sound classification using Hidden Markov Models (Joint project CMU and Mobile Fusion Inc.)Areas of research: Time series, sound recognition, Hidden Markov Models

- Learning algorithms on data (ladar, odometer, stereo camera images) from a Mobile Robot for planning
Areas of research: Mobile robotics, Reduced Rank Hidden Markov Models, Linear Dynamical Systems
Supervisors: Geoffrey Gordon, Artur Dubrawski .

- **Robotics Institute Summer Scholar** June 28 – September 30, 2008.

Carnegie Mellon University - Robotics Institute - School of Computer Science,
Select Lab - Pittsburgh - United States

- Learning algorithms on data (ladar, odometer, stereo camera images) from a Mobile Robot for planning
Areas of research: Computer vision(Structure from motion, SIFT features), Mobile Robotics.
Supervisor: Geoffrey Gordon.

- **Lead researcher (Non-funded project)** August 2007 – August 2008.

Universidad Militar Nueva Granada - Research Center - Engineering School,
Grupo de sistemas particulados complejos , Bogotá Colombia

Research project: Robot for Odour Source Localisation (Design and Construction)

Areas of research: Sensor systems, mobile robotics, Artificial intelligence (Bio-inspired algorithms)

- **Young Researcher** February – December 2007.

Universidad Militar Nueva Granada - Research Center - Engineering School,
Grupo de sistemas particulados complejos , Bogotá Colombia

Research project: Physiochemical sensors for explosives detection

Areas of research: Sensor systems, artificial intelligence (neural networks).

Advisor: Watson L. Vargas Ph.D.

- **Research assistant** August 2006 – December 2006

Universidad Militar Nueva Granada - Research Center - Engineering School,
Grupo de sistemas particulados complejos , Bogotá Colombia

Research project: Physiochemical sensors for explosives detection

Areas of research: Sensor systems, artificial intelligence (neural networks).

Advisor: Watson L. Vargas Ph.D.

Publications:

1. Ramos J. A. , Siddiqi S., et al., "Automatic State Discovery for Unstructured audio scene analysis". Iccasp 2010. (Accepted).
2. Ramos J. A. and Vargas W. L. "Pattern recognition from a sensor array using neural networks". Proceedings of 23rd ISPE International Conference on Cad/Cam Robotics and factories of the future. ISBN 978-958-978-597-3 (2007).
3. Ramos J. A. and Vargas W. L. "Reconocimiento de patrones en un arreglo sensorico usando redes neuronales". Ciencia e Ingeniería Neogranadina. ISSN 01248170 Vol. 17 No.1 (2007).
4. Ramos J. A. and Vargas W. L. "Icarus, Software para reconocimiento de patrones de arreglos sensoricos". Proceedings of 3rd IEEE Colombian Workshop on Robotics and Automation. ISBN 978-958-978-658-1 (2007).

Presentations:

1. Ramos J. A. (speaker) and W. L. Vargas. "Pattern recognition from a sensor array using neural networks". 23rd ISPE International Conference on Cad/Cam Robotics and factories of the future, Bogotá – Colombia. 2007.
2. Ramos J. A. (speaker) and W. L. Vargas. "Icarus, Software para reconocimiento de patrones de arreglos sensoricos-Icarus, *Software for pattern recognition from sensor array*", 3rd IEEE Colombian Workshop on Robotics and automation, Cartagena - Colombia 2007.
3. Ramos J. A. (speaker) and W. L. Vargas. "Atractores caoticos como dispositivo de sensado-*Chaotic attractors as sensor devices*", 1st UMNG Research Meeting, Universidad Militar Nueva Granada. Bogotá – Colombia. 2007.
4. Ramos J. A. (speaker) and W. L. Vargas. "Sensorica en desminado humanitario, -*Sensors in humanitarian demining* (poster)", 1st UMNG Week of Human rights, Universidad Militar Nueva Granada. Bogotá – Colombia. 2006.
5. Ramos J. A. (speaker) and W. L. Vargas. "Chaotic attractors. Theory, simulation and experiments". Engineering week, Universidad Militar Nueva Granada. Bogota – Colombia. 2006.
6. Ramos J. A. 2nd IEEE Colombian Workshop on Robotics and automation. 2006. Project exhibited: Hovercraft. San Buenaventura University. Bogotá - Colombia.
7. Opening season Science + Technology. Project exhibited: Hovercraft, design and construction. Maloka. Bogotá – Colombia
8. Expo-Science. October 2005. Project exhibited: Hovercraft, design and construction. Corferias, Bogotá – Colombia.
9. Expo-Student. November 2005. Project exhibited: Hovercraft, design and construction. Corferias. Bogotá – Colombia.
10. Ramos J. A. 1st Colombian Workshop on Robotics and automation. 2005. Project exhibited: Hovercraft. Maloka, Bogotá – Colombia

Awards and Prizes:

1. First Programming Marathon, Universidad Militar Nueva Granada, Second Place. 2006.
2. First place, Robot Challenge: Design and construction of an autonomous robot. Universidad Militar Nueva Granada – Engineering School – Mechatronics department. 2005.
3. First Mechatronics WorkShop, Universidad Militar Nueva Granada, First Place, Project Name: Chaotic Attractors Theory, simulation and experiments. 2007.
3. Selected for the young researcher program at the Research Center, School of engineering. Universidad Militar Nueva Granada, 2006-2007.
4. Second best ECAES in the Mechatronics Program 2005 (Still). ECAES (*is an examination done to all the senior students in their specialties in my case though a mechatronics engineer I had to take the electronics engineering*

ECAES. <http://www.umng.edu.co/www/section-3840.jsp>)

5. First place, Design and Construction of an Hovercraft. Universidad Militar Nueva Granada – Engineering School – Mechatronics department. 2004.

Prototypes:

1. Sensor System for detection of organic volatile compounds (VOC):
Software, Data acquisition Board, Gas sensing validation bank and Gas sensor module.
2. Robot for localisation of odour sources
3. Dipping device for deposition of polymers
4. Hovercraft

Programing and software experience:

Programming

C++ and C - Windows – Using Borland C++ Builder

C++ and C - Linux

Matlab

Perl Shell scripting

Software

Solid Edge	<i>Mechanical design</i>
Solid Works	<i>Mechanical design</i>
Visual Nastran	<i>Physics simulation</i>
Ansys	<i>Finite element analysis</i>
Blender	<i>3D Graphical design</i>
Multisim	<i>Electronic Circuits simulation</i>

References:

Dr. Watson L. Vargas

Associate professor

School of Engineering,

Universidad de los Andes

Bogotá, D.C – Colombia

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Dr. Geoffrey Gordon
Associate research professor
School of Computer Science,
Machine Learning Department,
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Dr. Artur Dubrawski
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Dr. Sajid Siddiqi
Research scientist
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