

CARLOS VILLEGAS

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Dublin, Ireland
Nationality: Mexican Date of Birth : December 16, 1978

PROFILE

A target-driven and proactive mechanical/control engineer with experience working on advanced control systems and mechanical design from concept to real tests. Has proven his project management skills as well the ability to work both unsupervised and in team environments during various internships and academic projects. With excellent oral and written communication, has also very good organization and language skills.

EDUCATION

Nov 2004 –
to date **Ph.D. in Control Engineering** – expected graduation: November 2008
Hamilton Institute at NUI Maynooth (Co. Kildare, Ireland)
Development and testing of Integrated Controllers for passenger vehicles in collaboration with DaimlerChrysler as part of the EU project CEMACS; Development of Decentralized Control Methodology based on Passivity; Design of Adaptive Active Suspension design with decoupled Comfort and Handling; Rear-wheel Steering Application to increase Safety and Handling.

Sep 2002 –
Aug 2004 **Master of Science in Mechatronics**
CINVESTAV-IPN (Mexico City, Mexico)
CNC machining, CAD/CAM/CAE, non-linear control, robotics, real-time programming, computer architecture, sensors and actuators.
Master Thesis project at DaimlerChrysler.

Sep 1997 –
May 2002 **Mechanical-Electrical Engineer**
ITESM – Campus Ciudad de México (Mexico City, Mexico)
Electronics, power electronics, CAD, control systems, materials science, manufacturing, machine design, mechanical vibrations, power systems.

Sep 2000 –
Jun 2001 **Exchange program in France**
EPF – École d'Ingénieurs (Sceaux, France)
Vehicle dynamics, finite element method, sheet metal forming, fatigue and crack propagation, metallurgy, composite materials.

INTERNSHIPS IN EUROPE

Jun 2006 -
Jul 2006 **Google**
Develop and test improvements to the boot time of Linux-Debian as part of the *summer of code 2006*

Sep 2003 –
May 2004 **DaimlerChrysler AG (Esslingen, Germany)**
Active suspension control design and experimental testing in two test vehicles; testing vehicle steering via roll moment distribution (warp); analysis of interactions with Electronic Stability Program (ESP).

Jan 2001
– June 2001 **Bureau Veritas. (Paris-La Défense, France)**
Revision and improvement of rules for fatigue strength of welded ship structures.

INTERNSHIPS IN MEXICO

Jun 2002 –
Aug 2002 **Graduaciones Tauro (Mexico City).**
Jewelry manufacturer with 15 workers. Member of management board. The tasks included production control, deal with workers and supervise sales.

Jun 2000 –
Aug 2000 **Beutelspacher (Mexico City).** Plastic extrusion and blow molding machines manufacturer. The tasks included design, drawing and production of machine parts and molds using Pro/Engineer.

Jun 1999 –
August 1999

General Motors de México (Toluca City).

Revision of Mexican vehicle standards and creation of an international database.

SOFTWARE

CAD/CAM/CAE: **AutoCAD, Pro-Engineer, Unigraphics,**
Control: **Matlab / Simulink / Stateflow / Dymola / dSpace ControlDesk**
Linux hard real-time programming: **RTAI**
languages: **C, C++/Basic / Perl / Javascript / CGI / HTML / Latex**
Finite-Element-Method: **CASTEM 2000 / Visual Nastram**

LANGUAGES

Spanish mother tongue
English fluent
French fluent
German intermediate

SELECTED ACCOMPLISHMENTS

IT
2008 Irish Patent Application P88405IE00 “ Method and System For Providing A Text Messaging Service” (inventor).
Control Engineering
2003 Differential flatness controller of rotatory inverted pendulum in real-time.
Machine-Design
2002 Extrusion machine design and construction. Injection mold design.
Business
2000 Winner business plan at Entrepreneurship Contest ITESM-CCM
Aeronautics
1998-1999 President of the Experimental Aviation School Association.
Production of monoplane / Free flight contest organization.
Car Design
1998 Construction in team of an off road vehicle for SAE Minibaja contest in El Paso, Texas, USA.
Submarine-Design
1997 Second place in Submarine Design ASME Contest in Mexico City.

PUBLICATIONS AND EU PROJECT REPORTS

Feb 2005 Villegas, C., D. Leith, and R. Shorten,
“Deliverable 2: Integrated Chassis Control - State-of-the-Art”,
In CEmACS Project Report - First Review.
Oct 2005 Villegas, C., M. Akar, and R. Shorten,
“Deliverable 8: Integrated Chassis Control - Controller Specification”,
In CEmACS Project Report - Second Review.
Oct 2006 Barreras, M., C. Villegas, M. Garcia-Sanz, and J. Kalkkuhl,
“Robust QFT tracking controller for a car equipped with 4-wheel steer-by-wire”,
In Proc. of the *IEEE International Conference on Control Applications*, Munich.
Nov 2006 Villegas, C., M. Akar, and R. Shorten,
“Deliverable 14: Integrated Chassis Control - Simulation Results”,
In CEmACS Project Report - Third Review.
Nov 2006 Villegas, C., D. Leith, and R. Shorten,
“Control Design for Integrated Chassis Control”,
In Deliverable 15: Controller Design,
In CEmACS Project Report - Third Review.

- Jun 2007 Villegas, C., D. Leith, R. Shorten, and J. Kalkkuhl,
 “A disturbance response decoupling controller for emulating vertical dynamics”
 In *IEEE Intelligent Vehicles Symposium IV'07*, Istanbul, Turkey.
- Jun 2007 Villegas, C., M. Akar, R. Shorten, and J. Kalkkuhl,
 “A Robust PI controller for Emulating Lateral Dynamics of Vehicles”,
 In *IEEE Intelligent Vehicles Symposium IV'07*, Istanbul, Turkey.
- Jul 2007 Villegas, C., M. Readman, M. Akar, and R. Shorten,
 “Deliverable 21: Integrated Chassis Control – Final Report”,
 In CEMACS Project – Final Review.
- Apr 2008 Villegas, C., M. Corless, R. Shorten, M. Readman, and S. Solmaz,
 “Decentralised control design of lateral and vertical vehicle dynamics using
 passivity”, In 79th Annual Meeting of the *International Association of Applied
 Mathematics and Mechanics*, Bremen, Germany.
- Apr 2008 Readman, M. C., M. Corless, C. Villegas, and R. Shorten,
 “Adaptive road disturbance decoupling for active suspensions”,
 In 79th Annual Meeting of the *International Association of Applied Mathematics and
 Mechanics*, Bremen, Germany.
- Jun 2008 Readman, M. C., M. Corless, C. Villegas, and R. Shorten,
 “Self-tuning for disturbance transmission decoupling in active vehicle
 suspensions”, In *Proceedings of the American Control Conference*, Seattle.
- 2008 (in press) Readman, M. C., M. Corless, C. Villegas, and R. Shorten,
 “Adaptive Williams Filters for Active Vehicle Suspensions”,
Transactions of the Institute of Measurement and Control.

HOBBIES

Swimming, football, history and arts.

REFEREES

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