

# Dr. Pere Ramos-Bosch

## Personal Details

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Date of Birth: 30-10-1980

Nationality: Spanish

## Work Experience

Nov 2008 – Present Technical University of Catalonia (UPC)  
group of Astronomy and GEomatics (gAGE)

### Senior Researcher

Reporting to Dr. Manuel Hernandez-Pajares

- Working as a senior researcher and consultant in GNSS, in particular GPS, GALILEO, EGNOS and Low Earth Orbit (LEO) satellite navigation.

Feb 2004 – Oct 2008 Technical University of Catalonia (UPC)  
group of Astronomy and GEomatics (gAGE)

### PhD Student / Junior Researcher

Reporting to Dr. Manuel Hernandez-Pajares

- Working as a researcher and consultant in GNSS.
- PhD dissertation thesis development.
- Involvement in several R+D projects (Neural Networks for Radionavigation, EGNOS Data Collection and Analysis Network, FES-WARTK and EGNOS Integrity Analysis).

Nov 2003 – Feb 2004 INDRA Space

### Proposal Assistant

Reporting to Dr. Josep Antoni Perlas

- Giving support to proposal preparations to the EU 6<sup>th</sup> Framework Programme (FP6).

## Education

Feb 2004 – Nov 2008 Technical University of Catalonia (UPC)  
group of Astronomy and GEomatics (gAGE)

### PhD in Aerospace Science and Technology

- PhD title: *Improvements in autonomous GPS navigation of Low Earth Orbit satellites*. (available at <http://files.gage.es/ThesisPRB/ThesisPRB.pdf>)
- Supervisors: Dr. Manuel Hernandez-Pajares (gAGE/UPC), Dr. Miguel Juan (gAGE/UPC) and Dr. Oliver Montenbruck (DLR).

Sep 2002 – Feb 2006 University of Barcelona (UB)

### BSc. Physics

Specialty: Astrophysics and Astronomy.

Sep 1998 – Sep 2004 Technical University of Catalonia (UPC)

### Engineer of Telecommunications

Final Project: GPS multipath estimation in ground stations.

### Journal papers

- M. Hernandez-Pajares, J.M. Juan, J. Sanz, A. Aragon-Angel, P. Ramos-Bosch, D. Odijk, P. Teunissen, J. Samson, M. Tossaint, M. Albertazzi, P. de Bakker, S. Verhagen, H. van der Marel, *Wide-Area RTK*, Inside GNSS, pp. 35-46, March/April 2010.
- O. Montenbruck, P. Ramos-Bosch, *Precision real-time navigation of LEO satellites using global positioning system measures*, GPS Solutions, DOI 10.1007/s10291-007-0080-x, Vol. 12, No. 3, pp. 187-198, 2008.
- P. Ramos-Bosch, M. Hernandez-Pajares, J.M. Juan, J.Sanz, *Real time GPS positioning of LEO satellites mitigating pseudorange multipath through neural networks*, Journal of the Institute of Navigation, Vol. 54, No. 4, pp. 309-315, 2007.
- M. Tossaint, J. Samson, F. Toran, J. Ventura-Traveset, M. Hernandez-Pajares, J.M. Juan, J. Sanz, P. Ramos-Bosch, *The Stanford-ESA Integrity Diagram: A New Tool for The User Domain SBAS Integrity Assessment*, Journal of the Institute of Navigation, Vol. 54, No. 2, pp. 153-162, 2007.
- P. Ramos-Bosch, M. Hernandez-Pajares, J.M. Juan, J.Sanz, *Mitigación de multipath de código mediante redes neuronales*, Mapping Interactivo, No. 119, pp. 10-13, 2007.

### Conference proceedings

- O. Montenbruck, A. Hauschild, F. Zangerl, W. Zsalcsik, P. Ramos-Bosch and U. Klein, *Onboard Real-Time Navigation for the Sentinel-3 Mission*, ION GNSS 2009, Savannah, USA, 2009.
- J. Sanz, P. Ramos-Bosch, A Aragon-Angel, M. Ciollaro, F. Toran, J. Ventura-Traveset, C. López, *The User Domain Integrity Assessment Technique*, 4<sup>th</sup> ESA Workshop on Satellite Navigation. User Equipment Technologies (NAVITEC), Noordwijk, Netherlands, 2008.
- M. Hernandez-Pajares, J. M. Juan, J. Sanz, A. Aragon-Angel, P. Ramos-Bosch, D. Odijk, P. F. de Bakker, H. van der Marel, S. Verhagen, I. Fernandez-Hernandez, M. Toledo, J. Samson, *Feasibility Study of a European Wide Area Real Time Kinematic System*, 4<sup>th</sup> ESA Workshop on Satellite Navigation. User Equipment Technologies (NAVITEC), Noordwijk, Netherlands, 2008.
- M. Tossaint, J. Samson, F. Toran. J. Ventura-Traveset, M. Hernandez-Pajares, J.M. Juan, J. Sanz, P. Ramos-Bosch, *The Stanford - ESA Integrity Diagram: A proposal to assess robustness of SBAS integrity in the user domain*, Proceedings of the 3<sup>rd</sup> ESA Workshop on Satellite Navigation. User Equipment Technologies (NAVITEC), Noordwijk, Netherlands, 2006.
- W. Vigneau, F. Benghouzi, O. Nouvel, M. Manzano-Jurado, C. Carrascosa-Sanz, H. Abdulkader, D. Roviras, M. Hernandez-Pajares, P. Ramos-Bosch, C. Macabiau and P. Holsters, *Neural networks algorithms prototyping to mitigate GNSS multipath for LEO positioning applications*, Proceedings of the 3<sup>rd</sup> ESA Workshop on Satellite Navigation. User Equipment Technologies (NAVITEC), Noordwijk, Netherlands, 2007.
- P. Ramos-Bosch, *Real time GPS positioning of LEO satellites mitigating pseudorange multipath through neural networks*, Proceedings of the Institute of Navigation, pp. 2548-1554, Fort Worth, Texas, 2006.

### Stages in research centers

- **German Space Agency (DLR)**: Two months stay (January-February 2007) with Dr. Oliver Montenbruck to research on real time orbit dynamics integrated with GPS. The results of the stage were published in a paper.
- **European Space Agency (ESA)**: Two one-week stages (June 2007 and May 2008) at **ESTEC** (*European Space Research and Technology Centre, ESA*, Noordwijk, The Netherlands) in the context of a project to study the feasibility of the WARTK system. Laboratory work with GPS and GALILEO equipment: receivers and **simulators**.

### Awards

- **Best Presentation Award**, ION GNSS 2006, Fort Worth, Texas: Best presentation of its session (Space and Satellite Applications).
- **Student Paper Sponsorship**, ION GNSS 2006, Fort Worth, Texas: Award for the ION GNSS 2006 conference. It covered all travel, hotel and registration expenses.
- **Student Poster Sponsorship**, NAVITEC 2008, Noordwijk, The Netherlands: Award for the NAVITEC 2008 conference. It covered all travel, hotel and registration expenses.

### Teaching experience

- Laboratory support to the course Precise GPS Data Processing of 20 hours at the Institut de Geomàtica at the Castelldefels Campus (November 2005).
- Laboratory substitutions of the GPS Data Processing subject at the ETSETB engineering university.
- Theory substitutions on the Algebra subject at the ETSETB engineering university.

### Involvement in R+D funded projects

- **Precise Real Time Orbit Determination and Time Synchronization (PRTODTS)**: Project funded by the **European Space Agency (ESA)** for the study of a feasible way to provide real time orbits and clock offset of GPS satellites.
- **Enhanced PPP (EPPP)**: Project funded by **ESA** for the study of the best way to use precise real time orbits and clock offset of GPS satellites for the user positioning. One week stage on the ESTEC installations in the frame of the project (see stages in research centers).
- **EDUNAV**: Project funded by **ESA** to create an educational tool for students and professionals in Global Navigation Satellite Systems.
- **Neural Networks for Radionavigation**: Project funded by the **ESA** for the study of the usage of neural networks for multipath mitigation on Low Earth Orbit satellites (LEO).
- **EGNOS Data Collection and Analysis Network**: Project funded by **EUROCONTROL** for the monitoring and analysis of anomalies in EGNOS.
- **FES-WARTK**: Support to this project funded by **ESA** for the study of the WARTK feasibility. One week stage on the ESTEC installations in the frame of the project (see stages in research centers).
- **EGNOS Integrity Analysis**: Project funded by **ESA** for the Integrity Analysis of the EGNOS system.

- Invited conferences**
- *L'Agència Espacial Europea (ESA): el seu passat i futur*. Cerdanyola, Spain. October, 2008.
  - *The future european satellite navigation system GALILEO and its expectations*. Castelldefels, Spain. May, 2008.
  - *Mitigación de multipath de código mediante redes neuronales*. Pamplona, Spain. October, 2006.
- Technical meetings**
- NAVITEC 2008, ESTEC/ESA, Noordwijk, The Netherlands. December 2008.
  - Spirent Simulator User Conference 2007, Barcelona, Spain. November 2007.
  - GPS Workshop, Austin, Texas, USA. October 2006.
  - V Jornadas GPS, Aplicaciones GPS: Agricultura, Ingeniería, Ciencias de la Tierra, Pamplona. October 2006.
  - ION GNSS 2006, Institute of Navigation, Fort Worth, Texas, USA. September 2006.
- Courses and seminars**
- Realization of the specialization course *Technology Project Management* of 8 hours done by Michael D. Griffin, formerly NASA administrator 2005-2009. Course held by *Fundació UPC* (December 2009).
  - Realization of the specialization course *Quality Assurance in Critical Software and Systems. Focus on Transport and Aerospace Applications* of 30 hours done by the *Fundació UPC* (November 2007).
  - Realization of the *Negotiation Course* of 4 hours done by the *l'Associació d'Amics de la UPC* (November 2007).
  - Realization of the *Jornades Doctorials 2007* done by the Catalanian Government (GenCat). March 2007.
- Fellowships**
- **Researcher Training fellowship (FI)**, given by the Catalanian Government (GenCat) for the realization of the PhD Dissertation (2004-2008).
  - **Fellowships for stages outside Catalonia (BE)**, fellowship given by the Catalanian Government (GenCat) for a two months stay (January-February 2007) at the German Space Agency (DLR) with Dr. Oliver Montenbruck. The results of the stage were published in a paper.
- Others**
- Languages: **English** (fluent), **French** (basic), Spanish (native), Catalan (native).
  - High programming skills in different languages: C, C++, Fortran, Shell script and gawk.
  - Finalist of the 3<sup>rd</sup> Programming Contest of the UPC.
  - *Open Water Diver* license for recreational diving.