
JOSÉ MIGUEL VARELA

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EDUCATION

Technical University of Lisbon Ph.D. in Naval Architecture and Marine engineering Numerical Simulation of Ship Dynamics in Virtual Environments Very Good	2012
University of Glasgow M.Sc. in Naval Architecture and Marine engineering Virtual Reality Models for Ship Damage Control Approved	2004
Technical University of Lisbon Graduation in Naval Architecture and Marine Engineering	1999

EXPERIENCE

CENTEC – Centre for Marine Technology and Engineering
Assistant Researcher | Ph.D. Researcher **January 2000 – September 2014**

Participation in R&D projects:

Towing Dynamics of Ships in Harbour Areas (TOWING)

Duration: 2010.04.01 – 2013.09.30
Entity: Foundation of Portuguese Universities (PTDC/ECM/100686/2008)
Rule: Development of ship models and virtual scenario to visualize a control ship towing operations Development of distributed virtual environments.

Safe Offloading from Floating LNG Platforms (SAFEOFFLOAD)

Duration: 2006.01.01 – 2009.10.31
Entity: EU – Programme Transport II
Rule: Development of ship models and virtual scenario to visualize and control in real-time the approaching of a LNG vessel to a barge for offloading operations.

Condition Assessment of Aging Ships for Real Time Structural Maintenance Decision (CAS)

Duration: 2005.04.01 – 2008.03.31
Entity: EU – Programme EU-STREP
Rule: Development of a rapid prototyping CAD tool to model ship structures for visual inspection and measurement of plate thicknesses and condition.

Virtual Ship Model to Support the Ship Damage Emergency Plans (VIRTUAL SHIP)

Duration: 2001.11.01 – 2003.10.31
Entity: Foundation of Portuguese Universities and Ministry of Defence
Rule: Development of a Virtual Environment to support decisions in emergency situations in military vessels in risk of flooding, fire or contamination.

Maritime Virtual Enterprise Network (MARVIN)

Duration: 1998.12.01 – 2001.11.30

Entity: EU – Programme ESPRIT

Rule: Data specification and exchange between shipyard and ship owner management systems through neutral internet platform to assist communication during the enquiry, contract and ship building phases.

DOMAIN OF SPECIALIZATION

Computer Aided Design (CAD) and Geometric modelling.
Interactive simulations of maritime scenarios in Virtual Environments.

RESEARCH INTERESTS

Geometric modelling: methodologies for automatic and semi-automatic parametric ship hull modelling. Virtual Reality models of floating structures.

Simulations in Interactive and Distributed Virtual Environments: design and development of virtual models that allow the visualization and interaction in real-time with physical simulations of typical maritime scenarios based in the state of the art mathematical models.

Scientific visualization: use of 3D Computer Graphics techniques and Abstract Visualization Objects to display large of complex amounts of data in Virtual Environments (such as ship structures' components, sea surface, etc.)

Ocean simulation: visualization of the sea surface waves in real-time using multi directional spectra and multi-grids for different levels of detail.

GPU programming: use of modern graphics hardware programming capabilities to increase the speed of computation.

SOFTWARE

CAD and 3D modelling:	3D Studio Max, Rhinoceros 3D
2D Painting/Drawing:	Corel Paint Shop Pro
3D Animation:	3D Studio Max
Interactive Graphics API:	OpenGL, Ogre3D
Ship design:	AutoShip, Orca 3D
Programming:	C++, GLSL
Databases:	MySQL

PUBLICATIONS AND PAPERS

Thesis

J.M. Varela, Numerical Simulation of Ship Dynamics in Virtual Environments (in Portuguese), Doctor of Philosophy (PhD) Thesis, Technical University of Lisbon, Centre for Marine Technology and Engineering, Portugal, 2012.

J.M. Varela, Virtual Reality Models for Ship Damage Control. Master of Science (MSc) Thesis. University of Glasgow, United Kingdom, 2004.

Book Chapters

J.M. Varela and C. Guedes Soares, A high level architecture framework for real-time simulation of ship towing operations in virtual environments, *Developments in Maritime Transportation and Exploitation of Sea Resources*, C. Guedes Soares, F. López Pena (Eds.), Taylor & Francis Group, 2014, Vol. 1, ISBN: 978-1-138-00161-9, pp. 135-147.

J.M. Varela and M. Ventura, Generation of an Adaptive Triangular Mesh from a Parametric Surface, *Maritime Engineering and Technology*, C. Guedes Soares, Y. Gorbato, S. Sutulo, T.A. Santos (Eds.), CRC Press - Taylor & Francis Group, 2012, ISBN: 978-0-415-62146-5, pp. 107-115.

J.M. Varela, A.J. Cacho, C. Guedes Soares, Virtual Environments for simulation and study of maritime scenarios, *Marine Technology and Engineering*, C. Guedes Soares, Y. Gorbato, N. Fonseca, A.P. Teixeira (Eds.), Taylor & Francis Group, 2011, Vol. 1, ISBN: 978-0-415-62888-4, pp. 719-741.

J.M. Varela, Serge Sutulo and C. Guedes Soares, Interactive Manoeuvrability Simulator for the Catamarans Operating in Tagus River (in Portuguese), *O Sector Marítimo Português*, C. Guedes Soares e C. Costa Monteiro (Eds.), Edições Salamandra, 2010, ISBN: 978-9726892373, pp. 569-582.

J. M. Varela, Manuel Ventura and C. Guedes Soares, *Digital Prototyping of Hull Structures in Basic Design*, Analysis and Design of Marine Structures, C. Guedes Soares, P. K. Das (Eds.), Taylor & Francis, 2009, ISBN: 978-0415549349, pp. 457-465.

J.M. Varela and C. Guedes Soares, Real-time visualization of the Sea Surface Based on Directional Wave Spectrums (in Portuguese), *Inovação e Desenvolvimento nas Actividades Marítimas*, C. Guedes Soares e V. Gonçalves de Brito (Eds.), Salamandra, 2006, ISBN: 978-9726892328, pp. 703-716.

J. M. Varela and C. Guedes Soares, Survey of Techniques for Real-Time Visualization of the Ocean Surface, *Maritime Transportation and Exploitation of Ocean and Coastal Resources*, C. Guedes Soares, Y. Garbatov, N. Fonseca (Eds.), Taylor & Francis, Vol. 2, 2005, ISBN: 978-0415390361, pp. 1167-1174.

J.M. Varela and C. Guedes Soares, Virtual Model to Support Ship Damage Control Operations (in Portuguese). *As Actividades Marítimas e a Engenharia*, C. Guedes Soares e V. Gonçalves de Brito (Eds.), Edições Salamandra, 2004, ISBN: 978-9726892328, pp. 713-727.

J. M. Varela e C. Guedes Soares, Virtual Environment for Visualization and Control of Progressive Flooding On-board (in Portuguese). *O Mar, Fonte de Desenvolvimento Sustentado*, C. Guedes Soares, J. Beirão Reis e M. B. Martins Guerreiro (Eds.), Edições Salamandra, 2002, ISBN: 978-9726892151, pp. 477-490.

International journals

J.M. Varela and C. Guedes Soares, Ring Discretization of the Wave Spectrum for the Sea Surface Simulation, *IEEE Computer Graphics & Applications*, 34(2): 58-71, 2014, doi:10.1109/MCG.2013.102.

J.M. Varela, J.M. Rodrigues and C. Guedes Soares, On-board Decision Support System for Ship Flooding Emergency, *Procedia Computer Science*, Elsevier, 29: 1688-1700, 2014, ISSN: 1877-0509.

J.M. Varela, Manuel Ventura e C. Guedes Soares, Product data model of hull structures and digital prototyping system for basic structural design, *Ships and Offshore Structures*, Taylor & Francis, 6(1): 3-14, 2011, doi: 10.1080/17445302.2010.480900.

J. M. Varela e C. Guedes Soares, A Virtual Environment for Decision Support in Ship Damage Control, *IEEE Computer Graphics & Applications*, 27(4): 32-43, 2007, doi:10.1109/MCG.2007.74

Conferences

J.M. Varela and C. Guedes Soares, Interactive simulation of ship motions in random seas based on real wave spectra, *GRAPP 2011 - Proceedings of the International Conference on Computer Graphics Theory and Applications*, March 5-7, 2011, Vilamoura, Algarve, Portugal, SciTePress 2011, ISBN: 978-9898425454, pp. 235-244.

J. M. Varela, Manuel Ventura and C. Guedes Soares, Fast Ship Structures Modelling System for Hull Maintenance Support, *Proceedings of the International Symposium on Ship Repair Technology: Life Cycle Effect of Ship Repairs (SRT'2008)*, pp. 49-58.

J. M. Varela, T. A. Santos e C. Guedes Soares, Visualization and Control of a Flooding Simulation Onboard Using a 3D Virtual Environment (in Portuguese), *Proceedings of the Congresso de Métodos Computacionais em Engenharia (CMCE 2004)*, 31 May - 2 June 2004, Lisboa-Portugal.

J. M. Varela, T. A. Santos and C. Guedes Soares, Simulation of Fluid Dissemination in a Virtual Reality Environment On-board the Ship, *Proceedings of the 2nd International Conference on Computer Applications and Information Technology in the Maritime Industries (COMPIT'03)*, 14-17 May 2003, Hamburg, Germany, pp. 432-443.

J. M. Varela and C. Guedes Soares, An Object Oriented Architecture of a Fluid Dissemination Virtual Environment in a Ship, *Proceedings of the SIMOUEST 2002*, 28-29 November 2002, Nantes, France.

LANGUAGES

Portuguese – Native language

English – speak fluently and read/write with high proficiency

French and Spanish – basic understanding

MEMBERSHIPS

Order of Engineers of Portugal – College of Naval Architecture. Professional license nº 42575.

TurboSquid (www.turbosquid.com) gold member as Maritime Virtual Worlds.