

Academic *Curriculum Vitae*

Dr. Max Blanco

1. Personal Information

Name

Dr. Max Blanco

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Toronto, Ontario

CANADA M6G2W8

1.1. Previous Research Positions

| Position | Institution | Dates |
|--|---------------------------------------|---------------------------|
| CNRS Postdoctoral Fellow | Institut Pascal (UBP) | 01 May 2011 - 30 Apr 2012 |
| Project Manager | University of Southampton | 15 Oct 2007 - 14 Oct 2010 |
| Research Engineer | University of Toronto | 01 Jan 1996 - 30 Sep 1996 |
| Research Engineer | University of Toronto | 01 Oct 1997 - 30 Jun 1997 |

1.2. Educational Qualifications

| Year | Month | Item |
|------|---------|--|
| 2007 | June | Doctor of Aerospace Engineering at the University of Toronto |
| 1995 | October | Master of Applied Science in Aerospace Engineering at the University of Toronto |
| 1994 | June | Bachelor of Applied Science in Engineering Physics at Queen's University, Kingston Ontario |

1.3. Honours and Distinctions

| Year | Month | Item |
|------|-------|---|
| 2011 | May | Conseil National de Recherche Scientifique Chercheur Postdoctorant en Visual Feedback Control |
| 2010 | Aug | NATO Advanced Study Institute on Advanced All-Terrain Vehicles travel and accommodation award |
| 2009 | Dec | ‘Turbulohmeter’ investigation grant (via Roberts Fund) |
| 2007 | Oct | Marie Curie Experienced Researcher Fellowship |
| 1998 | Jan | NSERC Post Graduate Scholarship - renewed |
| 1997 | Jan | NSERC Post Graduate Scholarship |
| 1997 | Jan | Connaught Scholarship at the University of Toronto (declined) |
| 1994 | Sep | Connaught Scholarship at the University of Toronto |
| 1994 | Sep | SNAME Graduate Scholarship |
| 1994 | Sep | University of California, Berkeley Graduate Scholarship (declined) |
| 1994 | May | Honour List of the Dean of Applied Science at Queen’s* |
| 1993 | Sep | Maj. James H. Rattray Scholarship - renewed |
| 1993 | May | Honour List of the Dean of Applied Science at Queen’s |
| 1993 | Sep | Maj. James H. Rattray Scholarship |
| 1992 | May | Honour List of the Dean of Applied Science at Queen’s |
| 1992 | Sep | Queen’s Honour Matriculation Award - renewed |
| 1991 | May | Honour List of the Dean of Applied Science at Queen’s |
| 1991 | Sep | Queen’s Honour Matriculation Award |

1.4. Language Skills

- English (Native)
- French (Native)
- Spanish (Advanced)

2. Research and Development

2.1. Articles in progress

1. BLANCO, M. AND Y. MEZOUAR, “Visual feedback control of 2WDD robot by mobile overhead camera” [International Conference Robots and Automation 2014](#) to be submitted on 15 September 2013.
2. BLANCO, M. AND Y. MEZOUAR, “ Multi-vehicular visual feedback control in a mapped environment” [Journal of Field Robotics](#), to be submitted Q4, 2013.

3. BLANCO, M. AND Y. MEZOUAR, “One-pass camera calibration for aerial and satellite imagery,” [IEEE Transactions on Image Processing](#), to be submitted Q4, 2013.
4. BLANCO, M. AND Y. MEZOUAR, “A data compression algorithm for closed 2D curves,” [Autonomous Robots](#), to be submitted Q4, 2013.
5. BLANCO, M. AND P. A. WILSON, “On Green’s integral and the virtual mass of scalene ellipsoids,” [Trans. ASME: Journal of Fluids Engineering](#), shortened version to be submitted Q4, 2013.
6. BLANCO, M. AND Y. MEZOUAR, “AFMAFlightSim: outil statique de simulation de vols aériens pour développement d’appareils videoelectroniques,” [CNRS Magazine](#), to be submitted after publication of item 9.
7. BLANCO, M. AND Y. MEZOUAR, “Pattern recognition by invisible feature detection,” [Pattern Recognition Letters](#), submitted June 2012, feedback received August 2012, to be resubmitted Q4, 2013.

A tool for geometrical inference of invisible features is described here. A least-squares Euclidean distance function is minimised by evaluation over a combinatorial population. This algorithm serves to detect invisible n -gons in the robotics laboratory of the Institut Pascal.

2.2. Articles submitted

8. BLANCO, M. AND P. A. WILSON, “The hydrostatic and hydrodynamic balance under load of a reconfigurable AUV towtruck,” [Applied Ocean Research](#), submitted April 2013.

A proposal for an AUV towtruck is envisaged, in order to return subsurface buoys to manned platforms where they can be maintained or destroyed. The AUV towtruck has its performance envelope specified here, in measurements of weight, buoyancy, cable scope, power and the like. Some modifications to a flatfish-bodied AUV in order to maintain its hydrostatic and hydrodynamic balance under load are described. A reconfigurable robot results.

9. BLANCO, M. AND Y. MEZOUAR, “Hodograph of Kepler simulated by Cartesian robot,” [Advanced Robotics](#), submitted March 2013.

An algorithm is developed to program the dynamics of a Cartesian robot along the elliptical paths followed by some astronomical bodies. Kepler’s laws are reviewed, and a hodograph method is chosen for implementation. The Archimedean analysis of π is extensible to hodographs and to Keplerian ellipses. The algorithm is experimentally proven on a five cubic metre device.

10. BLANCO, M., “The Diophantine Spiral,” [Geometry & Topology](#), resubmitted July 2013.

The Diophantine spiral is a spiral centred on the origin of the Cartesian coordinate system whose values are limited to the natural numbers, \mathbb{N} . It is a near cousin to Ulam's spiral. It is shown completely to cover the integral values of the infinite Cartesian plane. Two theorems are proven: bijective algorithms are given whereby to locate the Cartesian axes on the Diophantine spiral, and vice-versa.

11. BLANCO, M., J. W. CRENSHAW AND Y. MEZOUAR, "Integer Navigation, Part 2: The integer hypotenuse function," [The Computer Journal](#), submitted April 2013 along with [12](#).

The integer-valued square root and hypotenuse functions are analogs to their real-valued equivalents. Several advantages obtain from the integer algorithms described here, not least that they economize complexity in an integrated circuit environment. The solution in integer space of the square root function is a necessary precursor to the implementation in these environments of navigation algorithms. Unlike the CORDIC technique, the present algorithm needs no lookup table. The algorithm proposed here is due to Crenshaw, and is compared in the range $\pm 2^{11}$ to the C99 [hypotf/sqrt](#) algorithm. The [isqrt](#) algorithm is seen accurate to within a fraction of a percent in the L_2 -norm, within five percent in the L_1 -norm if the range excludes $(0,20)$ and inaccurate at very close range in the L_1 -norm. The algorithm is a candidate for inclusion in the next iteration of ISO/IEC 9899 standard. Part 1/2 investigated an integer arctangent function.

12. BLANCO, M. AND Y. MEZOUAR, "Integer Navigation, Part 1: The integer arc tangent function," [The Computer Journal](#), submitted March 2013 along with [11](#).

The integer-valued arc tangent function is an analog to its real-valued equivalent. Several advantages obtain from the integer algorithm described here, not least that it economizes complexity to $O(1)$ in an **integer-only** integrated circuit environment. The solution in integer space of the arc tangent function is a necessary precursor to the implementation in these environments of navigation algorithms. Unlike the CORDIC technique, the present algorithm needs no lookup table. The algorithm proposed here is due to Black, and is compared in the range $\pm 2^{11}$ to the [atan2](#) algorithm and seen to be accurate to within two percent in the L_∞ -norm, and to within a fraction of a percent in the L_2 -norm. The algorithm is a candidate for inclusion in the next ISO/IEC 9899 standard. Part 2/2 will investigate an integer square root and an integer hypotenuse function.

2.3. Journal Papers - Academic Journals

13. BLANCO, M. AND P. A. WILSON, "A review of external hydrodynamics with experimental data assessment for low-speed ocean flows," [Trans. ASME: Journal of Fluids Engineering](#), **134**(3)

This article describes a literature review focused on published empirical measurements of external flows over bodies of revolution that can be employed for verification and validation of calculations of survey-class Autonomous Underwater Vehicles (AUVs) or other like bodies. The flow regime for a survey-class AUV is defined, and a mathematically-optimal velocity results for these energy-limited vehicles. A range-maximal hotel load is one of the inferences.

Cavitation is shown not to affect this type of AUV. Environmental and computational problems of turbulence are discussed. A table of vital statistics of contemporary survey-class AUVs is provided.

14. BLANCO, M. AND D. W. ZINGG, 2007, “[Newton-Krylov algorithm with a loosely coupled turbulence model for aerodynamic flows](#),” *AIAA Journal*, **45**(5), pp. 980–987.
15. BLANCO, M. AND D. W. ZINGG, 1998, “[Fast Newton-Krylov method for unstructured grids](#),” *AIAA Journal*, **36**(4), pp. 607–612.

2.4. Conference papers submitted

None.

2.5. Book Chapters

16. BLANCO, M. AND L. MALATERRE, 2012, “[A Three-dimensional Spatiotemporal Sensor by Means of a Heterogeneous Biaxial Camera System](#).” *Applied Mechanics and Materials volume 162: Mechanisms, Mechanical Transmissions and Robotics*.

The capabilities of a biaxial camera system to verify control loops is investigated here with the verification of a Cartesian robot. The biaxial camera system will serve in the future as a tool to investigate the three-dimensional trajectories of insects, projectiles and other airborne devices. Three-dimensional motion is measured by means of two cameras arranged at right angles to each other with a common focal point. Control loop instructions to the robot allow it to simulate a circular orbit. The control system for the Cartesian robot is documented. The biaxial camera system allows an elliptical least-squares minimisation algorithm to be employed to measure the phenomenon produced by the Cartesian robot.

2.6. Conference Contributions - Refereed

17. BLANCO, M. AND L. MALATERRE, 2012, “[A Three-dimensional Spatiotemporal Sensor by Means of a Heterogeneous Biaxial Camera System](#).” *XI Annual Conference on Mechanisms and Mechanical Transmission*, Clermont-Ferrand, 5-8 June 2012; also see [16](#).
18. BLANCO, M. AND P. A. WILSON, 2010, “[Autonomous Underwater Vehicle Minimum-Time Navigation in a Current Field](#)”. Presented at MTS/IEEE Oceans’10 Seattle, WA, 19-24 September 2010.

The problem of navigation in a spatially variable current is reviewed, and for a certain class of mathematically-describable functions, solved for minimum time in closed form.

19. BLANCO, M., 2010, “[Viscous Effects for a Towfish System Structural Model](#)”. Presented at MTS/IEEE Oceans’10 Seattle, WA, 19-24 September 2010.

The vibration of structural members towed astern of a surface vessel has been modelled variously by strings and beams, neither of which accounts for the viscosity of water. The work of Cortinez and Laura accounts for viscosity as a damper. An application of their method to towfish systems and the vibrational modes which result are described.

20. BLANCO, M. AND P. A. WILSON, 2010, “ [Transverse Oscillations of an Underwater Beam-Cable System](#)”. Presented at the 8th IFAC Conference on Control Systems in Marine Applications, Rostock, Germany, 15-17 September 2010.

An Autonomous Underwater Vehicle refuel station is proposed. The power source is located on board a surface vessel, while the AUV is serviced at depth. The structure which connects the two craft is modelled as a cable-beam. Transverse oscillations of this cable-beam system are investigated through a fourth-order differential equation.

21. BLANCO, M. AND P. A. WILSON, 2010, “ [Autonomous Underwater Vehicle Pursuit of Biological Specimens in the Open Ocean](#)”. Presented at the 8th IFAC Conference on Control Systems in Marine Applications, Rostock, Germany, 15-17 September 2010.

The pursuit equations in two-dimensional space are examined, and then parametrised in terms of relative velocity and initial range. Several inferences about the behaviour of these equations are drawn. The burst speed of several fish species are tabulated, along with several types of Autonomous Underwater Vehicle. An example pursuit calculation is described.

22. BLANCO, M., 2010, “ [Proposal for a shipborne AUV refuel system](#),” OMAE2010-20413. Presented at the 29th International Conference on Ocean, Offshore and Arctic Engineering Shanghai, China - June 6-11, 2010.

Autonomous Underwater Vehicles (AUVs) are limited by the quantum of energy they can carry. Contemporary operational strategy is either to remove and replace the fuel source, or to refuel on-deck. Both strategies require the vehicle to surface, be recovered and be relaunched. This proposal obviates the time inefficiency by a novel arrangement of a shipborne electromechanical cable combined with a deepwater vehicle dock, similar to the concept of aerial refuel. A theoretical prototype is analysed with the aid of a steady-state three-dimensional cable mathematics. Its aim is to predict the length of cable required to place the device at a fixed depth below the ocean surface. A steady-state vibrational analysis predicts the natural frequencies of the device. The vortex-induced vibrations that can impact the device depend on velocity and cable diameter are prevented by the suitable choice of physical parameters.

23. BLANCO, M., 2010, “ [A Fleet of Autonomous Underwater Vehicles To Locate Air France Flight 447](#),” OMAE2010-20419. Presented at the 29th International Conference on Ocean, Offshore and Arctic Engineering Shanghai, China - June 6-11, 2010.

The recent accident of Flight 447 in the mid-Atlantic will serve as backdrop to this document. An introduction to the field of Autonomous Underwater Vehicles is produced and the present limitations therein. A proposal is made based on a near-term forecast of developments in this field to improve the location and recovery of the emergency beacons.

24. BLANCO, M., 2009, “ [Proposal for an AUV refuel station](#). ” Presented at MTS/IEEE Oceans’09 Biloxi, MS, 26-29 October 2009.

A proposal for a buoy station for AUV refuel is described and depicted. An algorithm to calculate the forces on, and displacements of the buoy is selected. The buoy is to be funded and manufactured before September 2010, when it is to see service in the Azores as part of FREE[_{sub}]NET week, a public outreach activity of EC contract number MCRTN-036186. The design calls for a low-maintenance permanent installation. The buoy is to be accessible to the public for research purposes upon prior written permission.

25. BLANCO, M., 2009, “ [An economically rational selection of submarine hull materials.](#)” Presented at MTS/IEEE Oceans’09 Bremen, Germany, 11-14 May 2009.

The selection of an external pressure vessel material is described. Failures in the rupture and buckle modes are discussed, as well as the problem of submarine hull hydrostatics. A spherical geometry admits simplification to allow focus on the economic problem. The economic cost function is comprised of 28 variables: the market prices of the alloy components, some material properties of the alloy, and various extrinsic data. A variant of the exhaustive search method was preferred due to the discontinuous nature of the price data. A large database of alloys is searched, preliminary results obtained for a selection of 19 AISI alloys in the 300 and 400 series, and conclusions drawn.

26. BLANCO, M. AND D. W. ZINGG, 2006, “[A Newton-Krylov algorithm with a loosely-coupled turbulence model](#)”, AIAA 2006-691. Presented at the 44th [AIAA](#) Aerospace Sciences Meeting and Exhibit, 9-12 Jan., Reno, Nevada.
27. BLANCO, M., AND D. W. ZINGG, 1997, “[A Fast Solver for the Euler Equations on Unstructured Grids Using a Newton-GMRES Method,](#)” AIAA 97-0331. Presented at the 35th [AIAA](#) Aerospace Sciences Meeting and Exhibit, Reno, Nevada.

2.7. Conference Contributions - Other

28. BLANCO, M., February 2013. “An Introduction to Flight Mechanics and Control”, **Invited Lecture** at the University of Bristol Department of Aerospace Engineering.
29. BLANCO, M., September 2012. “Visual Feedback Control of Multiple Terrestrial Vehicles in a Suburban Environment by an Overhead Camera”, **Invited lecture** for the [First Croatian Computer Vision Workshop](#) at the [Centre of Excellence for Computer Vision](#), University of Zagreb.

An autonomous helicopter has been projected to be the locus of supervisory control for a multi-agent terrestrial vehicle system for purposes such as the Fukushima clean-up. The supervision here has been branded ‘Omniscient Observer’ and is based on a ‘perch and stare’ computer Graphical Regulation via Omniscient Observer Feedback Vision (GROOFV). This talk will break down some of the more important algorithms employed in the present GROOFV system, and document the suburban field test environment at the Institut Pascal in Clermont-Ferrand, as well as the apparatus needed to implement the prototype GROOFV system. Future work plans will be discussed to miniaturise the GROOFV system into a European smart camera that is to be transported at Fukushima by a Korean 125kcc helicopter in order to regulate the actions of surface decontamination or rescue intervention robots.

30. BLANCO, M., November 2010. “Progress on the Turbulohmeter Project”, 47th [Marine Measurement Forum](#), Farnborough UK.
31. BLANCO, M., September 2010. “Past, Present and Future of an Effort to Model Fluid-Structure Interactions” **Invited lecture** at the [Basque Center for Applied Mathematics](#), Bilbao.
32. BLANCO, M., August 2010, “How to find a needle in an underwater haystack”, 2010 NATO Advanced Study Institute on Advanced All-Terrain Autonomous Systems poster presentation.
33. BLANCO, M., January 2010, “Proposal for an AUV refuel buoy system,” University of Southampton School of Engineering Sciences Fluid and Structures Interaction Group ‘Away Day’ 2010 poster presentation.
34. BLANCO, M., January 2009, “An Autonomous Underwater Vehicle Basin at Southampton”. Prepared for 2010 [Parliamentary ‘SET for BRITAIN’](#) competition.
35. BLANCO, M., January 2009, “An economically rational selection of submarine hull materials,” University of Southampton School of Engineering Sciences Fluid and Structures Interaction Group ‘Away Day’ 2009 poster presentation.
36. WILSON, P. A. AND M. BLANCO, January 2008, “Some UoS FSI Group Autonomous Underwater Vehicle Activities: Past, Present and Future” University of Southampton School of Engineering Sciences Fluid and Structures Interaction Group ‘Away Day’ 2008 lecture presentation.
37. BLANCO, M., January 2008, “FREEsubNET” University of Southampton School of Engineering Sciences Fluid and Structures Interaction Group ‘Away Day’ 2008 poster presentation.

2.8. Patent Applications

38. BLANCO, M., “Visual Feedback Control of —”. Application for Patent to be submitted to the French [Institut National de la Propriété Intellectuelle](#). Target submission date Q3, 2013.

2.9. Editorships - Journal or Other

39. Reviewer - 2013 Robotics Society of Japan Journal of [Advanced Robotics](#).
40. Reviewer - 2013 International Conference on Robotics and Automation (ICRA) [Karlsruhe](#).
41. Reviewer - 2011 International Federation Automatic Control World Congress ([18th IFAC WC 2011 Milan](#)).
42. Reviewer - 2011 International Conference on Robotics and Automation (ICRA) [Shanghai](#).

2.10. Editorships - Newsletter

43. Publisher of, and contributor to, [FREESubNET](#) 'Newsletter'

2.11. Official Reports - Part of Report

44. FREESUBNET CONSORTIUM, 2010, "RTN Final activity report. FREESubNET - A European research network on key technologies for intervention autonomous underwater vehicles," Contract number MCRTN-CT-2006-036186.
45. FREESUBNET CONSORTIUM, 2008, "RTN Mid-term activity report. FREESubNET - A European research network on key technologies for intervention autonomous underwater vehicles," Contract number MCRTN-CT-2006-036186.

2.12. Other Publications - Research

46. BLANCO, M., 2007, [A Newton-Krylov Solver with a Loosely-Coupled Turbulence Model for Aerodynamic Flows](#), Ph.D. thesis, University of Toronto Institute for Aerospace Studies.
47. BLANCO, M., D. W. ZINGG AND C. R. ETHIER, 1997, "Improvements to the NSI incompressible Navier-Stokes flow solvers," Contract Report for Defence Research Establishment Atlantic, Dartmouth, N. S.
48. BLANCO, M., D. W. ZINGG AND C. R. ETHIER, 1996, "A three-dimensional incompressible Navier-Stokes flow solver," Contract Report for Defence Research Establishment Atlantic, Dartmouth, N. S.
49. BLANCO, M., 1995, [An Implicit Solution Method for the Euler Equations on Unstructured Triangular Grids](#), Master of Applied Science thesis, University of Toronto Institute for Aerospace Studies.
50. BLANCO, M., 1994. [Feasibility of an Underground Mine Equipment Positioning System](#), Bachelor of Applied Science thesis, Queen's University Department of Engineering Physics.

2.13. Other Publications - Research Equivalent

51. FREESUBNET CONSORTIUM, November 2008, "Project acronym: FREESubNET MCRTN-CT-2006-036186. Work Package 1 - New AUV concepts," Unpublished development report.
52. FREESUBNET CONSORTIUM, November 2008, "Project acronym: FREESubNET MCRTN-CT-2006-036186. Work Package 2 - New Standards," Unpublished development report.
53. FREESUBNET CONSORTIUM, November 2008, "Project acronym: FREESubNET MCRTN-CT-2006-036186. Work Package 3 - Navigation techniques," Unpublished development report.

54. FREESUBNET CONSORTIUM, November 2008, “Project acronym: FREEsubNET MCRTN-CT-2006-036186. Work Package 4 - Autonomous underwater telemanipulations,” Unpublished development report.
55. FREESUBNET CONSORTIUM, November 2008, “Project acronym: FREEsubNET MCRTN-CT-2006-036186. Work Package 5 - Vehicle control and mission management system,” Unpublished development report.

2.14. Other Media - Proposals & Research Equivalent

56. BLANCO, M., June 2013, a multi-youBot co-ordination proposal for the [KUKA Innovation in Mobile Manipulation Award](#) entitled Foundation construction with several youBots, application 15 June 2013, withdrawn 1 July 2013.
57. BLANCO, M., A. MAMIC AND Z. KOVACIC, April 2012, Visual feedback control of robotic devices via overhead/external camera; with example application to autonomous mobile robots for waterjet treatment of concrete and metal surfaces submission to the “[Technical Catalogue for Machine/Equipment Development for Fuel Debris Removal Preparation at TEPCO Fukushima Daiichi Nuclear Power Plant](#)”
 - Invited by Hitachi-GE to [bid for contract](#), November 2012.
 - Invited by Mitsubishi to [bid for contract](#), December 2012.

Visual feedback control of robotic devices via overhead/external camera ; with example application to AUTONOMOUS MOBILE ROBOTS FOR WATERJET TREATMENT OF CONCRETE AND METAL SURFACES. A control system or a data acquisition system from overhead or external cameras is described. System is known as ‘visual feedback control’ or ‘visual servoing’ of mobile robots, and applicable to both static and dynamic/mobile devices. Remote control is enabled via wireless wifi and/or Bluetooth technology.

58. BLANCO, M., September 2011, a multi-AUV construction technique for [www.difis.eu](#)-type structures entitled The AXA Research IDIFIOOS Proposal unsuccessful application to the [AXA Research Post-Doctoral Fellowship](#).

2.15. Exhibitions - Group

59. BLANCO, M., 2012, “AFMAFlightSim”. Exhibit and presentation as part of the [Institut Pascal](#) contribution to a [Universite Blaise Pascal ‘Journée Portes Ouvertes’](#) outreach activity.
60. BLANCO, M. AND N. C. TOWNSEND, 2010, “Turbulohmeter”. Exhibit, posters and presentation as part of the 2010 [Cheltenham Science Festival](#).
61. BLANCO, M. AND N. C. TOWNSEND, 2010, “Turbulohmeter”. Exhibit, posters and presentation as part of the University of Southampton ‘[Spectra Roadshow](#)’ outreach activity.

2.16. Design Practice

62. SELF-CERTIFIED, in February 2013, www.exoco.net as a target of the People's Republic of China Army [Advanced Persistent Threat 1](#).
63. BLANCO, M., 2013, Automatic navigation by solar interferometry, unpublished design notes.
64. BLANCO, M., as of November 2012, Twenty-year compendium of somewhere between 150-400 utility programmes for all-purpose engineering. Documentation compiled to date: 133 perl programs over eight years; 21 shell scripts; 45 fortran utilities; 3 C utilities.
65. BLANCO, M., 2012, Design for an undersea smart camera, unpublished design notes.
66. BLANCO, M. AND OTHERS, 2012, Design for a commoditized low-power miniature smart camera, unpublished design notes.
67. BLANCO, M., 2012, Stereographic projection camera, unpublished design notes.
68. BLANCO, M., L. MALATERRE AND L. SUTY, 2011, LED collar for AFMA end-effector, unpublished design notes.
69. BLANCO, M., 2010, Control of a small all-terrain vehicle by means of an inertial navigation unit, unpublished design notes from NATO/ASI.
70. BLANCO, M., 2010, The retrofit implementation to the 'Gilkes' water flume of a fluid velocimetric device, unpublished design notes.
71. BLANCO, M. AND M. P. RUMPFKEIL, 2008, Fortran at Bombardier, unpublished lecture notes.
72. BLANCO, M., M. P. RUMPFKEIL, T. LEUNG AND J. E. HICKEN, 2006, Fortran at Bombardier, unpublished lecture notes.

2.17. Consultancy

73. Provided a contract in Spring 2008 with M. P. Rumpfkeil to instruct, over two full days, 20 engineers at [Bombardier Aerospace](#) Montreal in the Fortran language.
74. Contracted in Fall 2006 with [Bombardier Aerospace](#) Toronto and three colleagues to deliver a two-day lecture series in the Fortran language.

2.18. Web sites/Web site design/CD ROM

75. 2007-2010: responsible for the conception, design and maintenance of www.freesubnet.eu. Features included: split between extramural and intramural zones; intramural wikimedia site; intramural document depository.
76. 2007-2010: responsible for the conception and administration of the *FREE_{sub}NET* real-time concurrent version server (CVS) document tree.
77. 2009-2010: responsible for the www.freesubnet.eu captive web server, in public rest area of building 28 for intramural dissemination of research results.
78. 2008-2010: contributor and maintainer of the ‘[soton](#)’ archive on the [Comprehensive Tex Archive](#) website.

3. Teaching

| Year | Month | Item |
|------|-------|---|
| 2008 | May | ‘Fortran at Bombardier (Montréal)’ lecture series |
| 2006 | Fall | Assistant for AER1316h ‘Fundamentals of Computational Fluid Dynamics’ (University of Toronto) |
| 2006 | Nov | ‘Fortran at Bombardier (Toronto)’ lecture series |

4. Administrative Activities

79. Secretary of *FREE_{sub}NET* project meeting at the University of Southampton (Southampton, UK: September 2010)
80. Chairman of *FREE_{sub}NET* virtual project meeting (July 2010)
81. Secretary of *FREE_{sub}NET* project meeting at the European Commission Joint Research Centre [Maritime Affairs Unit](#) of the [Institute for Protection and Security of the Citizen](#) (Ispra, Italy: May 2010)
82. Secretary of *FREE_{sub}NET* project meeting at the University of Craiova (Craiova, Romania: February 2010)
83. Secretary of *FREE_{sub}NET* project meeting at [CEA/LIST](#) (Paris: October 2009)
84. Chaired *FREE_{sub}NET* Workshop on ‘[AUV Launch and Recovery Systems](#)’ at [MARUM](#) (Bremen, Germany: May 2009)
85. Secretary of *FREE_{sub}NET* project meeting at [UMII/LIRMM](#) (Montpellier, France: March 2009)
86. Secretary of *FREE_{sub}NET* project meeting in [Universidad de Girona](#) (Girona, Spain: November 2008)
87. Seconded to [Universidad de Girona](#) (two weeks, October 2008)

88. Secretary of [FREE_{sub}NET](#) project meeting at [University of Southampton](#) (Southampton, UK: September 2008)
89. Secretary of [FREE_{sub}NET](#) project meeting at [University of Hannover](#) (Hannover, Germany: July 2008)
90. Chaired workshop at [IFAC NGCUV'08](#) (Killaloe, Ireland: April 2008)
91. Secretary of [FREE_{sub}NET](#) project meeting at [Universidad de Girona](#), (Girona, Spain: March 2008)
92. Chaired [FREE_{sub}NET](#) project meeting at the [Hellenic Center for Marine Research](#) (Athens: November 2007)

5. Professional Development

93. BLANCO, M., 2010, [NATO Advanced Study Institute on Advanced All-Terrain Vehicles](#), attended 10-day robotics laboratory session.
94. BLANCO, M., 2010, “Risk Assessment Description for the Electrical Safety of the Turbulohmeter Team”, written for University of Southampton School of Engineering Sciences.
95. BLANCO, M. AND N. C. TOWNSEND, 2010, “Public Display of Turbulohmeter - Risk Assessment”, written for University of Southampton School of Engineering Sciences.
96. BLANCO, M. AND N. C. TOWNSEND, 2010, “Surface preparation of borosilicate glass - Risk Assessment and COSHH form”, written for University of Southampton School of Engineering Sciences.
97. BLANCO, M. AND N. C. TOWNSEND, 2010, “High temperature diffusion of precious metals into borosilicate glass - Risk Assessment”, written for University of Southampton School of Engineering Sciences.
98. [Marine Technology Society](#) ‘Underwater Cables and Connectors for End Users’ tutorial, attended in conjunction with Oceans’09 Biloxi, October 26, 2009.
99. Qualified as a University of Southampton budget holder, 2008.
100. Attended [European Patent Academy](#) ‘Intellectual Property Rights Workshop for Marie Curie Fellows’, Munich, November 2008.

6. Other Community Activities

101. M. WALTHER, M. BLANCO AND B. BAUDICHON, 2012. Course in ‘French as a Second Language’, hosted by the Aubière branch of the [Accueil des Villes Françaises](#) for graduate-level students at the local [Campus des Cézeaux](#).

102. BLANCO, M., 2012. Hosted three high-school students for three full days each at the [Institut Pascal](#) laboratory facilities for part of their ‘work experience’ curriculum.
103. BLANCO, M., 2012. Initiated, designed and led the outreach activities of the [Institut Pascal](#) for the [Université Blaise Pascal](#) ‘Journée Portes Ouvertes’
104. BLANCO, M. AND N. C. TOWNSEND, 2010, “Turbulohmeter”. This exhibit was part of the the University of Southampton ‘[Spectra Roadshow](#)’ outreach activity, produced in 2010 by Tony Curran and Steve Dorney. (see also §[2.15](#) entry)



University of Toronto

This is to certify that

Max Blanco

has fulfilled the requirements of the
University of Toronto
and has been admitted under the
authority of the Governing Council of the
University of Toronto to the degree of

Doctor of Philosophy

In witness whereof we have hereto
subscribed our names and affixed the
academic seal of the University

JUNE 21, 2007



Conroy

PRESIDENT

S. Dhillon

DEAN OF THE SCHOOL OF
GRADUATE STUDIES

Louise Blaney

SECRETARY OF THE GOVERNING COUNCIL