Curriculum Vitae

Roger Bustamante Plaza

Dirección:	Departamento de Ingeniería Mecánica Universidad de Chile Facultad de Ciencias Físicas y Matemáticas Beauchef 851, Santiago, 8370448 Chile
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Personal:	Casado con hijos
Nacionalidad:	Chileno
Lenguajes:	Inglés

Educación:

Estudios de Postgrado:

University of Glasgow, Glasgow, United Kingdom
Fechas: Septiembre 2004-Septiembre 2007
Grado: Doctorado (Matemáticas)
Título de Tesis: 'Mathematical modelling of non-linear magneto- and electro-active rubber-like materials'
Supervisor de Doctorado: Raymond Ogden

Universidad Técnica Federico Santa María, Valparaíso, Chile
Fechas: Marzo 1998 -Noviembre 2000
Grado: Magister en Ingenieía Mecánica
Título de Tesis: 'Aplicación de la mecánica de fractura con dos parmetros para un recipiente a presión con una grieta elíptica 3D'
Supervisores de Magister: Fernando Labbé, Juan Donoso

Estudio de Pregrado:

Universidad Técnica Federico Santa María, Valparaíso, Chile
Fechas: Marzo 1993-Septiembre 2000
Título Profesional: Ingeniero Civil Mecánico
Título de Memoria: 'Modelación con elementos finitos de los esfuerzos residuales en uniones soldadas'
Supervisores: Fernando Labbé, Juan Donoso

Experiencia Docente y de Investigación:

Julio 2016–a la fecha:	Profesor Titular Departamento de Ingeniería Mecánica Universidad de Chile
Noviembre 2012–Junio 2016:	Profesor Asociado Departamento de Ingeniería Mecánica Universidad de Chile
Noviembre 2007–Octubre 2012:	Profesor Asistente Departamento de Ingeniería Mecánica Universidad de Chile
Septiembre 2005–Junio 2006:	Tutor de Cátedra Department of Mathematics University of Glasgow
Septiembre 2003–Agosto 2004:	Ayudante de Cátedra Department of Mathematics New Jersey Institutive of Technology
Marzo 2001–Julio 2003:	Instructor Departamento de Ingeniería Mecánica Universidad Técnica Federico Santa María
1998–2000:	Ayudante de Investigación Departamento de Ingeniería Mecánica Universidad Técnica Federico Santa María
1995–1998 :	Ayudante de Cátedra Departamento de Ingeniería Mecánica y Departamento de Matemáticas Universidad Técnica Federico Santa María

Administración

- Noviembre 2015 a la fecha: Encargado de diseñar la carrera de Ingenieráa Mecánica en la Universidad de O'Higgins.
- Octubre 2011 a Noviembre 2013: Jefe Docente (Jefe de Carrera) del programa de pregrado en Ingeniería Mecánica.

Editor

- 2014-2015: Editor invitado en la revista Acta Mechanica (*Volumen especial para el XIV Pan-American Congress of Applied Mechanics*)
- 2013-2014: Co-editor para el IMA Journal of Applied Mathematics (*Volumen especial en honor del cumpleaños 70 de Raymond Ogden*)

Membresía a Sociedades Científicas y Profesionales

- European Mechanics Society.
- The Society for Natural Philosophy.

- Sociedad Chilena de Mecánica Computacional.

Proyectos con Financiamiento Externo

- Abril 2016 a la fecha: Fondecyt nḿero 1160030 'On the use of implicit constitutive relations to model the behaviour of elastic and inelastic deformations in continua: Applications to the mathematical modelling of rock'.
- Marzo 2012 a Marzo 2016: Fondecyt número 1120011 'Study of some new constitutive laws for elastic bodies'.
- Noviembre 2008 a Octubre 2011: Fondecyt número 11085024 'Mathematical modelling of non-linear magneto-sensitive elastomers'.

Publicaciones

1. R. Bustamante, Solutions of some boundary value problems for a class of constitutive relation for nonlinear elastic bodies that is not Green elastic. *The Quarterly Journal of Mechanics and Applied Mathematics*, 69 (2016) 257-279.
2. M.H.B.M. Shariff, R. Bustamante, An anisotropic model for the Mullins effect in magneto-active rubber-like materials. *Journal of Mechanics of Materials and Structures*, 11 (2016) 559-582.
3. P. Arrue, R. Bustamante, D. Sfyris, A note on incremental equations for a new class of constitutive relation for elastic bodies. *Wave Motion* 65 (2016) 44-54
4. D. Sfyris, G.I. Sfyris and R. Bustamante, Nonlinear electro-magneto-mechanical constitutive modeling of monolayer graphene. *Proceedings of the Royal Society of London A*, 472 (2016) 20150750
5. R. Bustamante, O. Orellana, R. Meneses and K.R. Rajagopal, Large deformations of a new class of incompressible elastic bodies. *Zeitschrift fr angewandte Mathematik und Physik* 67 (2016) 47
6. R. Bustamante, M.H.B.M. Shariff, New set of invariants for an electro-elastic body with one and two families of fibres. *European Journal of Mechanics A* 58 (2016) 42-53.
7. S. Montero, R. Bustamante, A. Ortiz, Numerical study of some plane stress problems for a new class of constitutive relation for elastic bodies. *Acta Mechanica*, 227 (2016) 601-615.
8. R. Bustamante, K. R. Rajagopal, On the consequences of the constraint of incompressibility with regard to a new class of constitutive relations for elastic bodies. Small displacement gradient approximation. *Continuum Mechanics and Thermodynamics* 28 (2016) 293-303.
9. R. Bustamante, K. R. Rajagopal, Study of a new class of non-linear inextensible elastic bodies. *Zeitschrift fr angewandte Mathematik und Physik* 66 (2015) 3663-3677.
10. R. Bustamante, K. R. Rajagopal, A note on some new classes of constitutive relations for elastic bodies, *IMA Journal of Applied Mathematics*, 80 (2015) 1287-1299.
11. R. Bustamante, K. R. Rajagopal, Implicit constitutive relations in nonlinear magneto-elasticity. *Proceedings of the Royal Society of London A*, 471 (2015) 20140959
12. M.H.B.M. Shariff, R. Bustamante, On the strain invariants for a body with two preferred directions in nonlinear elasticity. *International Journal of Engineering Science* 97 (2015) 18-25

13. D. Sfyris, R. Bustamante, On the treatment of non-solvable implicit constitutive relations in solid mechanics, *Zeitschrift fr angewandte Mathematik und Physik*, 66 (2015) 1165-1774

14. R. Bustamante, K. R. Rajagopal, Solutions of some boundary value problems for a new class of elastic bodies. Comparison with the classical theory of linear elasticity: Part I Problems with cylindrical symmetry. *Acta Mechanica*, 226 (2015) 1815-1838

15. R. Bustamante, K. R. Rajagopal, Solutions of some boundary value problems for a new class of elastic bodies. Comparison with the classical theory of linear elasticity: Part II A problem with spherical symmetry. *Acta Mechanica*, 226 (2015) 1807-1813

16. E. Salas, R. Bustamante, Numerical solution of some boundary value problems in nonlinear magnetoelasticity, *Journal of Intelligent Material Systems and Structures*, 26 (2015) 156–171.

17. R. Bustamante, M.H.B.M. Shariff, A principal axis formulation for nonlinear magnetoelastic deformations: Isotropic bodies, *European Journal of Mechanics*, 50 (2015) 17-27

18. R. Bustamante, D. Sfyris, Direct determination of stresses from the stress equation of motion and wave propagation for a new class of elastic bodies, *Mathematics and Mechanics of Solids*, 20 (2015) 80-91

19. A. Ortiz-Bernardin, R. Bustamante, K. R. Rajagopal, A numerical study of elastic bodies that are described by constitutive equations that exhibit limited strains, *International Journal of Solids and Structures*, 51 (2014) 875–885.

20. D. Sfyris, R. Bustamante, Use of some theorems related with the tensor equation AX+XA=H for some classes of implicit constitutive relations, *The Quarterly Journal of Mechanics and Applied Mathematics*, 66 (2013) 157-163

21. R. Bustamante, R. W. Ogden, Nonlinear magnetoelastostatics: energy functional and their second variations, *Mathematics and Mechanics of Solids*, 18 (2013) 760–772.

22. R. Bustamante, K. R. Rajagopal, On a new class of electroelastic bodies. II. Boundary value problems, *Proceedings of the Royal Society of London A*, 469 (2013) 20130106.

23. R. Bustamante, K. R. Rajagopal, On a new class of electroelastic bodies: Part I, *Proceedings of the Royal Society of London A*, 469 (2013) 20120521.

24. F. Vogel, R. Bustamante, P. Steinmann, On some mixed variational principles in magneto elastostatics. *International Journal of Nonlinear Mechanics*, 51 (2013) 157–169.

25. G. deBotton, R. Bustamante, A. Dorfmann, Axisymmetric bifurcatios of thick spherical shells under inflation and compression, *International Journal of Solids and Structures*, 50 (2013) 403–413.

26. R. Bustamante, J. Merodio, On weak formulations and their second variation in nonlinear electroelasticity, *Mechanics Research Communications*, 46 (2012) 15–19.

27. R. Bustamante, K. R. Rajagopal, On the inhomogeneous shearing of a new class of elastic bodies, *Mathematics and Mechanics of Solids*, 17 (2012) 762–778.

28. A. Ortiz, R. Bustamante, K. R. Rajagopal, A numerical study of a plate with a hole for a new class of elastic bodies, *Acta Mechanica*, 223 (2012) 1971–1981.

29. F. Vogel, R. Bustamante, P. Steinmann, On mixed variational principles in electro-elastostatics, *International Journal of Nonlinear Mechanics*, 47 (2012) 341–354.

30. R. Bustamante, K. R. Rajagopal, Solutions of some simple boundary value problems within the context of a new class of elastic bodies, *International Journal of Nonlinear Mechanics*, 46 (2011) 376–386.

31. R. Bustamante, J. Merodio, Constitutive structure in coupled non-linear electro-elasticity: Invariant descriptions and constitutive restrictions, *International Journal of Nonlinear Mechanics*, 46 (2011) 1315–1323.

32. R. Bustamante, A. Dorfmann and R. W. Ogden, Numerical solution of finite geometry boundary-value problems in nonlinear magnetoelasticity, *International Journal of Solids and Structures*, 48 (2011) 874–883.

33. R. Bustamante, G. Holzapfel, Methods to compute 3D residual stress distributions in hyperelastic tubes with application to arterial walls, *International Journal of Engineering Science*, 48 (2010) 1066–1082.

34. R. Bustamante, J. Merodio, On some simple constitutive restrictions for transversely isotropic nonlinearly elastic materials and isotropic magneto-sensitive elastomers, *Journal of Engineering Mathematics*, 68 (2010), 15–26.

35. R. Bustamante, K. R. Rajagopal, A note on plane strain and plane stress problems for a new class of elastic bodies, *Mathematics and Mechanics of Solids*, 15 (2010), 229–238.

36. R. Bustamante, Transversely isotropic nonlinearly magnetoelastic solids, *Acta Mechanica*, 210 (2010), 183–214.

37. R. Bustamante, A variational formulation for a boundary value problem considering an electro-sensitive elastomer interacting with two bodies, *Mechanics Research Communications*, 36 (2009), 791–795.

38. R. Bustamante, A. Dorfmann and R. W. Ogden, On electric body forces and Maxwell stresses in an electroelastic solid, *International Journal of Engineering Science*, 47 (2009) 1131–1141.

39. R. Bustamante, Some topics on a new class of elastic bodies, *Proceedings of the Royal Society of London, Series A*, 465 (2009) 1377–1392.

40. R. Bustamante, Mathematical modelling of boundary conditions for magneto -sensitive elastomers: variational formulations, *Journal of Engineering Mathematics*, 64 (2009) 285–301.

41. R. Bustamante, Transversely isotropic non-linear electro-active elastomer, *Acta Mechanica*, 206 (2009) 237–259.

42. R. Bustamante, A. Dorfmann and R. W. Ogden, Nonlinear electroelastostatics: a variational framework, *Z. angew. Math. Phys.* 60 (2009) 154–177.

43. R. Bustamante, A. Dorfmann and R. W. Ogden, On variational formulations in nonlinear magneto-elastostatics, *Mathematics and Mechanics of Solids*, 13 (2008) 435–450.

44. R. Bustamante, A. Dorfmann and R. W. Ogden, A nonlinear magnetoelastic tube under extension and inflation in an axial magnetic field: numerical solution, *Journal of Engineering Mathematics*, 59 (2007) 139–153.

45. R. Bustamante, A. Dorfmann and R. W. Ogden, Universal relations in isotropic nonlinear magnetoelasticity, *The Quarterly Journal of Mechanics and Applied Mathematics*, 59 (2006) 435–450.

46. R. Bustamante, R. W. Ogden, On nonlinear universal relations in nonlinear elasticity, *Z. angew. Math. Phys.*, 57 (2006) 708–721.

47. R. Bustamante, R. W. Ogden, Universal relations for nonlinear electroelastic solids, *Acta Mechanica*, 182 (2006) 125–140.

Publicaciones en prensa

1. M.H.B.M Shariff, R. Bustamante, M. Hossain and P. Steinmann, A novel spectral formulation for nonlinear transversely magnetoelastic deformations. *Mathematics and Mechanics of Solids* (In press) DOI: 10.1177/1081286515618999
2. R. Meneses, O. Orellana, R. Bustamante, A note on the wave equation for a new class of constitutive relation for nonlinear elastic bodies. *Mathematics and Mechanics of Solids* (In Press) DOI: 10.1177/1081286516673234
3. R. Bustamante, Corrigendum: Direct determination of stresses from the stress equations of motion and wave propagation for a new class of elastic bodies. *Mathematics and Mechanics of Solids* (Accepted)
4. M.H.B.M. Shariff, R. Bustamante, J. Merodio, On the spectral analysis of residual stress in finite elasticity. *IMA Journal of Applied Mathematics* (Accepted)
5. R. Bustamante, K.R. Rajagopal, Implicit equations for thermoelastic bodies. *International Journal of Non-linear Mechanics* (Accepted)

Publicaciones en preparación

1. R. Bustamante, K.R. Rajagopal, An implicit viscoelastic model. (In Preparation)
2. R. Bustamante, K.R. Rajagopal, A nonlinear model for the mechanical behaviour of rock (In Preparation)
3. R. Bustamante, K.R. Rajagopal, Modeling residual stresses in elastic bodies described by implicit constitutive relations. (In Preparation)
4. M.H.B.M. Shariff, R. Bustamante, J. Merodio, Constitutive equations for fiber reinforced nonlinearly viscoelastic solids using spectral invariants. (Submitted)

Publicaciones en Proceedings

1. R. Bustamante, Numerical modelling of the behaviour of magneto-sensitive elastomers, Books of Abstracts, 2nd International Conference on Material Modelling, Eds. J. Besson and M. Mazière, Paris, France, 31 August to 2 September (2011), pp 7.
2. R. Bustamante, A simple constitutive inequality for isotropic magneto-sensitive elastomers, Proceedings of the 7th Euromech Solid Mechanics Conference (Books of Abstracts, Mini-Symposia), Eds. J. A. C. Ambrósio and M. P. T. Silva, Lisbon, Portugal, 7–11 September (2009), pp 463–464.
3. R. Bustamante, A. Dorfmann and R. W. Ogden, On boundary conditions in nonlinear magneto- and electroelasticity, Proceedings of the 5th European Conference on Constitutive Models for Rubber, ECCMR, Eds. A. Boukamel, L. Laiarinandrasana, S. Méo and E. Verron, Paris, France, 4–7 September (2007), pp 339–344.
4. R. Bustamante, A. Dorfmann and R. W. Ogden, A variational formulation for magneto-active elastomers based on a total energy function, PAMM Proceedings of Applied Mathematics and Mechanics, Vol. 7, 1090703-1090704 (2007)/ DOI 10.102/pamm.200700146

Cursos Cortos

- 'Nonlinear electro-elasticity: Theory and challenges for the numerical modelling'. Universidad Politécnica de Madrid, España, 2011.
- 'Variational formulations in solid mechanics'. Universidad Politécnica de Madrid, España, 2012.

Presentaciones en Conferencias

1. R. Bustamante, Some topics on some new classes of constitutive relations for elastic bodies, Department of Mechanical Engineering, University of Texas A&M, College Station, Texas, USA, 19th of January 2017.

2. R. Bustamante, Implicit constitutive relations for thermoelastic bodies. 40th Solid Mechanics Conference, Warsaw, Poland, 28th of August- 2nd September 2016.

3. R. Bustamante, Constraints for some new classes of constitutive relations for elastic bodies, 9th European Solid Mechanics Conference ESMC 2015, Madrid, Spain, 6-10 July 2015.

4. R. Bustamante, M.H.B.M. Shariff, New sets of invariants for an electro-elastic body with one and two families of fibres, Encuentro de Elasticidad No-lineal, Homogenizacin y Fractura, Facultad de Matematicas, Pontificia Universidad Catlica de Chile, 24-24 June 2015.

5. R. Bustamante, Some topics on some new classes of constitutive relations for elastic bodies, XXI Congreso sobre Métodos Numéricos y sus Aplicaciones ENIEF 2014, Bariloche, Argentina, 23–26 Septiembre 2014.

6. Ortiz-Bernardin, R. Bustamante, K. R. Rajagopal, Estudio numérico de cuerpos elásticos que están descritos por ecuaciones constitutivas que exhiben deformaciones limitadas, Jornadas de Mecánica Computacional, Santiago, Chile, 3–4 Octubre 2013.

7. R. Bustamante, New classes of constitutive relations for electro-elastic materials, International Workshop on New Trends in Solid Mechanics: Coupled Fields and Multi-scale Modelling, Castro Urdiales, Cantabria, España, 24–28 Junio 2013.

8. R. Bustamante, Implicit constitutive relations for electro-elastic bodies, Chinese-Italian Bilateral Meeting on Mechanics and International Workshop on Mathematical and Mechanical Modelling for Materials, City University of Hong Kong, Hong Kong, China 28–31 Agosto 2012.

9. R. Bustamante, K. R. Rajagopal, On a new class of elastic bodies: Some theoretical issues and applications, 8th European Solid Mechanics Conference, Graz, Austria 9–13 Julio 2012.

10. R. Bustamante, Numerical modelling of the behaviour of magneto-sensitive elastomers, 2nd International Conference on Material Modelling, Paris, Francia, 31 Agosto to 2 Septiembre 2011.

11. R. Bustamante, Un nuevo tipo de ecuación constitutiva para cuerpos elásticos: Desafíos para la modelación numérica, X Jornadas de Mecánica Computacional, Departamento de Ingeniería Estructural, Pontificia Universidad Católica de Chile, Santiago, 13–14 Octubre 2011.

12. R. Bustamante, Some topics on a new class of elastic bodies, Perambulation in Continuum Mechanics: A Meeting in Celebration of the 60th Birthday of Professor K. R. Rajagopal, Texas A&M University, College Station, Texas, Estados Unidos 11–13 Noviembre 2010.

13. R. Bustamante and G. Holzapfel, The problem of computing 3D residual stresses distributions in a neo-Hookean tube, Symposium in honor of the contribution of Ray Ogden, the recipient of the Prager Medal, 47th Annual Technical Meeting of the Society of Engineering Science, Iowa State University, Ames, Iowa, Estados Unidos 4–6 Octubre 2010.

14. R. Bustamante, Mathematical modelling of a new class of elastic bodies, Symposium on Nonlinear Mechanics in Celebration of the 60th Birthday of K. R. Rajagopal, 47th Annual Technical Meeting of the Society of Engineering Science, Iowa State University, Ames, Iowa, Estados Unidos 4–6 Octubre 2010.

15. R. Bustamante, Finite element modelling of magneto-sensitive elastomers, 9th World Congress on Computational Mechanics and 4th Asian Pacific Congress on Computational Mechanics (WCCM/APCOM 2010), Sydney, Australia 19–23 Julio 2010.

16. R. Bustamante, A variational formulation for a magneto sensitive body interacting with a rigid semi-infinite body, and some restrictions for the total energy function, Kolloquium für Mechanik, Universität Erlangen Nünberg, Erlangen, Alemania, 19 Enero 2010.

17. R. Bustamante, A simple constitutive inequality for isotropic magneto-sensitive elastomers, 7th Euromech Solid Mechanics Conference Lisboa, Portugal, 7–11 Septiembre 2009.

18. R. Bustamante, R. W. Ogden, Transversely isotropic electro-sensitive rubber-like materials, 3rd Canadian Conference on Nonlinear Solid Mechanics, University of Toronto, Toronto, Ontario, Canada 25–29 Julio 2008.

19. R. Bustamante, A. Dorfmann and R. W. Ogden, On boundary conditions in nonlinear magneto- and electroelasticity, 5th European Conference on Constitutive Models for Rubber, ECCMR, Paris, Francia, 4–7 Septiembre 2007.

20. R. Bustamante, A. Dorfmann and R. W. Ogden, A variational formulation for magneto-active elastomers based on the total energy approach, International Conference on Industrial and Applied Mathematics, Federal Institute of Technology, Zurich, Suiza 16–20 Julio 2007.

21. R. Bustamante, Transversely isotropic non-linear magneto-sensitive rubber-like materials, Kolloquium für Mechanik, Technische Universität Kaiserslautern, Kaiserslautern, Alemania, 27 Febrero 2007.

22. R. Bustamante, R. W. Ogden, Some boundary value problems for non-linear transversely isotropic electro-active elastomers, International Symposium on Trends in Applications of Mathematics to Mechanics (STAMM), Vienna University of Technology, Viena, Austria, 10–14 Julio 2006.

23. R. Bustamante, R. W. Ogden, A numerical model of the electric field for an electro-active rubber like cylinder under traction, British Applied Mathematics Colloquium (BAMC), Keele University, Reino Unido, 24–27 Abril 2006.

Visitas de investigación a otras universidades

He visitado los siguientes lugares para realizar estadías cortas de investigación:

- Septiembre 2014, University of Texas A&M, Estados Unidos
- Septiembre 2012, University of Erlangen-Nürnberg, Alemania
- Mayo 2012, Universidad Politécnica de Madrid, España
- Enero 2010, University of Glasgow, Reino Unido
- Enero 2010, Graz Univ. of Technology, Austria
- Julio 2008, University of Texas A&M, Estados Unidos

Tesistas de Magister

- Sebastian Montero: 'Solución numérica de algunos problemas de valor de frontera para un nuevo tipo de ecuación constitutiva considerando pequeñas deformaciones y comportamiento no lineal de solido' (2014).

- Patricio Arrué: 'Solución de algunos problemas de valor de frontera para un nuevo tipo de ecuación constitutiva considerando pequeñas deformaciones y comportamiento no lineal de solido' (2014).
- Eduardo Salas: 'Modelación numérica del comportamiento de elastómeros que reaccionan a campos magnéticos' (2012).

Memoristas (pregrado)

- Juan Parra: 'Inestabilidad elástica en materiales electroelásticos bajo el efecto de un campo eléctrico' (2014).
- Felipe Moroni: 'Análisis numérico del micromovimiento en implantes dentales sometidos a carga inmediata' (2013).
- Claudio Mutizabal: 'Análisis Numérico del Micromovimiento de distintos tipos de Supraestructura e implantes dentales sometidos a carga Inmediata' (2012).
- Antonio Zuñiga: 'Análisis Dinámico de Esfuerzos en un Sistema de Cañerias para el Transporte de Pulpa Mineral de Cobre' (2011).
- Eladio Hurtado: 'Modelación del Micromovimiento en Implantes Dentales Sometidos a Carga Inmediata por el Método de Elementos Finitos' (2011).
- Nicolas Farfan: 'Modelación del Proceso de Soldadura por Medio del Método de Elementos Finitos' (2010).
- Cristhian Sánchez: 'Selección de un Domo para Telescopio Robotico' (2010).

Revisor de artículos científicos

He sido revisor de publicaciones enviadas a las siguientes revistas:

- Journal of Elasticity
- International Journal of Solids and Structures
- Journal of Electrostatics
- Acta Mechanica
- Mathematics and Mechanics of Solids
- Proceedings of the Royal Society A
- International Journal of Damage Mechanics
- Computer Methods in Applied Mechanics and Engineering
- Mechanics Research Communications
- International Journal of Engineering Sciences
- International Journal of Non-linear Mechanics
- International Journal of Advances in Engineering Sciences and Applied Mathematics
- The European Physical Journal E: Soft Matter and Biological Physics
- Indian Journal of Engineering & Materials Sciences
- Rubber Chemistry and Technology

- The Quarterly Journal of Mechanics and Applied Mathematics
- Meccanica
- The Journal of the Mechanics and Physics of Solids
- Journal of Applied Physics
- International Journal of Engineering Technologies, IJET
- International Journal for Numerical Methods in Engineering
- BioMedical Engineering OnLine
- Mathematical Reviews
- Mathematical Problems in Engineering

Trabajo de consultoría

(*Los proyectos mencionados a continuación han sido desarrollados para la división El Teniente de Codelco. En dichos proyectos participé como integrante de laboratorio MMGeo del Centro de Modelación Matemática de la Universidad de Chile* http://mmgeo.cmm.uchile.cl)

- 2014: A study of the collapse phenomena in lateral caving.
- 2011–2012: A study for the determination of the breaking surfaces in the subterranean mine of El Teniente.
- 2009–2010: Stress field behavior in a primary rock mass in relation to the preconditioning.
- 2008–2009: Hydraulic fracture morphology analysis in primary rock body.

Otros

- Organizador del XIV Pan-American Congress of Applied Mechanics, 24-28 de Marzo 2014
- Co-organizador del mini-simposio 'Nonlinear Elasticity' para la '8th European Solid Mechanics Conference'