

Alejandro A. Ortiz

CONTACT INFORMATION

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EDUCATION

University of California, Davis, California, USA.

Sep. 2007 - Dec. 2010: Ph.D., Structural Engineering and Structural Mechanics.

- Thesis Topic: Information-Theoretic Meshfree Approximation Schemes in Solid Mechanics.
- Adviser: Professor N. Sukumar
- Area of Study: Computational Solid Mechanics.

Universitat Politècnica de Catalunya, Barcelona, Spain.

June 2002 - June 2003 (graduated in 2006): M.S., Numerical Methods.

- Thesis Topic: Meshless Methods.
- Thesis Title: *The Meshless Finite Element Method in 2D Linear Elasticity.*
- Advisers: Professor E. Oñate, Professor S. Idelsohn
- Area of Study: Computational Solid Mechanics.

Universidad Técnica Federico Santa María, Valparaíso, Chile.

1996 - 2002: B.S., Mechanical Engineering.

- Final Project: *Análisis de Restricción en Probetas C(T) con Metal de Soldadura.*
- Advisers: Professor F. Labbé, Professor J. Donoso
- Area of Study: Fracture Mechanics.

RESEARCH INTERESTS

My research interests lie in the areas of computational solid mechanics, computational biomechanics, applied mathematics and scientific computing with emphasis on object oriented programming. I have been involved in the development of meshfree methods with applications in solid and fluid mechanics. I am also highly interested in novel numerical methodologies for engineering and science such as x-fem and isogeometric analysis.

RESEARCH AND TEACHING EXPERIENCE

University of California, Davis, California, USA.

Sep. 2007 to present: *Graduate Research Assistant* at Department of Civil and Environmental Engineering.

- Developed a C++ class for meshfree basis functions to be used in computer codes to solve partial differential equations.
- Developed and implemented a new Galerkin-based meshfree method called *maximum entropy meshfree method*.
- Developed and implemented a new numerical approach for modeling linear and nonlinear incompressible materials with meshfree methods.

- Developed and implemented an improved numerical integration scheme for Galerkin meshfree methods.

Universidad Técnica Federico Santa María, Valparaíso, Chile.

2000 - 2002: *Undergraduate Research Assistant* at Department of Mechanical Engineering and Department of Material Sciences, Fracture Mechanics Group.

Universidad Técnica Federico Santa María, Valparaíso, Chile.

2002: *Teaching Assistant* at Department of Mechanical Engineering.

- Course: Finite Element Method.

PROFESSIONAL
AND INDUSTRIAL
EXPERIENCE

Consultant in Finite Element Analysis, Mechanical Design and Structural Analysis.

2007 to present: Delkor Americas, Santiago, Chile.

2009: Idisa S.A., Santiago, Chile.

2007 - 2008: Metso Minerals (Chile) S.A., Con-Cón, Chile.

2008: Delkor UK., Bath, UK.

2006: TPI S.A., Santiago, Chile.

2006: Temin Ltda., Calama, Chile.

Comecsa Ltda., Santiago, Chile.

2006 to present: Founder/Director.

Delkor South America Ltda. (now Delkor Americas), Santiago, Chile.

Jan. 2006 - Aug. 2007: Chief Engineer, head of design and drawing office.

Mar. 2005 - Dec. 2005: Project and Design Engineer.

Tersainox S.A., Santiago, Chile.

Dec. 2003 - Mar. 2005: Structural Engineer.

HONORS AND
AWARDS

Finalist, 22nd Annual Robert J. Melosh Medal Competition for the Best Student Paper on Finite Element Analysis, Duke University, Durham, NC, USA, 2010.

Student Travel Award, 10th U.S. National Congress on Computational Mechanics, Columbus, Ohio, USA, 2009.

Graduate Research Assistantship, Department of Civil and Environmental Engineering, University of California, Davis, USA, 2007-2010.

PROFESSIONAL
SOCIETY
AFFILIATIONS

ASME, American Society of Mechanical Engineers.

SIAM, Society for Industrial and Applied Mathematics.

TECHNICAL
SKILLS

Programming

Advanced programming experience in C, C++ and Matlab.

Intermediate programming experience in Fortran 77/90.

Scientific and Engineering Software

Advanced user of Staad Pro, Pro/Mechanica, GiD.

Basic/intermediate user of ADINA, Abaqus, Algor, AutoCad.

Computer Applications

T_EX (L^AT_EX, B_IB_TE_X).

Most common productivity packages for Windows and Unix/Linux platforms.

Operating Systems

Windows.

Unix/Linux platforms.

MATHEMATICAL
EXPERTISE

Applied numerical methods, Finite element methods, Meshfree methods.

ENGINEERING
EXPERTISE

Finite element analysis, Structural analysis, Fatigue and failure analysis/design, Mechanical design, Design of solid-liquid separation equipment (thickeners, clarifiers, press filters, etc.), Design of industrial tanks and pressure vessels. Advanced user of NCh 2369.Of2003, ASME VIII Div. 1, ASCE 7-05, IBC 2003, UBC 1997, AWWA D100-96, API 650, API 620 and ANSI/AISC 360-05 codes.

PRESENTATIONS

Competition Presentations

1. “Maximum-entropy meshfree method for incompressible media problems”, 22nd Annual Robert J. Melosh Medal Competition for the Best Student Paper on Finite Element Analysis, Duke University, Durham, NC, USA, April 2010.

Conference Presentations

1. “Maximum-entropy meshfree method for compressible and near-incompressible elasticity”, 10th U.S. National Congress on Computational Mechanics, Symposium on Applications of Meshfree Methods, Columbus, OH, USA, July 2009.

PUBLICATIONS

Papers in Refereed Journals

1. Ortiz A, Puso MA, Sukumar N. Maximum-entropy meshfree methods for incompressible media problems. *Finite Elements in Analysis and Design* 2010; (submitted).
2. Ortiz A, Puso MA, Sukumar N. Maximum-entropy meshfree methods for compressible and near-incompressible elasticity. *Computer Methods in Applied Mechanics and Engineering* 2010; **119**(25–28):1859–1871.

3. Donoso JR, Ortiz A, Labbe F. Numerical evaluation of the effect of the weld metal on the constraint factor in bi-metal C(T) specimens. *Revista de Metalurgia* 2003; **39**(5):357–366.

Conferences Publications

1. Donoso JR, Ortiz A, Mühlich U. Análisis de restricción en probetas C(T) con metal de soldadura. *CONAMET/SAM Simposio Materia* 2002; Santiago, Chile.
2. Nichterlein C, Bindhoff M, Ortiz A. Soluciones básicas de diseño a través de internet. *Anales del 9 Congreso Chileno de Ingeniería Mecánica, IV Congreso Nacional de Energía, COCIM-CONAE* 2000; Valparaíso, Chile.

REFERENCES

Available upon request.