

Manuel A. Sánchez-Uribe

CONTACT INFORMATION

Division of Applied Mathematics
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RESEARCH INTERESTS

Numerical Analysis, Scientific Computing, Numerical Solutions of Partial Differential Equations, Finite Elements Methods, Interface Problems, Polynomial Interpolation, Bernstein Polynomials.

EDUCATION

Brown University

Ph.D. Candidate, Applied Mathematics (expected May 2016).

- Dissertation Topic: Finite Element methods for Interface Problems.
- Advisor: Prof. Johnny Guzmán.

Sc.M. Applied Mathematics, May 2012.

University of Concepción, Concepción - Chile

B.A. in Mathematical Engineering, January 2010.

Mathematical Civil Engineer, professional qualification, January 2010.

- Thesis: Analysis of a Velocity-Pressure-Pseudostress Formulation for the Stationary Stokes Equations.
- Advisor: Gabriel Gatica.

PUBLICATIONS

- [1] Mark Ainsworth and Manuel A. Sánchez. Computing the Bézier control points of the Lagrangian interpolant in arbitrary dimension. *Submitted to SIAM Journal of Scientific Computing*, 2015.
- [2] Johnny Guzmán, Manuel A. Sánchez, and Marcus Sarkis. A finite element method for high-contrast interface problems with error estimates independent of contrast . Technical Report 2015-8, Scientific Computing Group, Brown University, Providence, RI, USA, July 2015.
- [3] Johnny Guzmán, Manuel A. Sánchez, and Marcus Sarkis. Higher-order finite element methods for elliptic problems with interfaces . Technical Report 2014-14, Scientific Computing Group, Brown University, Providence, RI, USA, November 2014.
- [4] Johnny Guzmán, Manuel A. Sánchez, and Marcus Sarkis. On the accuracy of finite element approximations to a class of interface problems. Technical Report 2014-6, Scientific Computing Group, Brown University, Providence, RI, USA, March 2014.
- [5] Johnny Guzmán and Manuel A. Sánchez. Max-norm stability of low order Taylor-Hood elements in three dimensions. *Journal of Scientific Computing*, 65(2):598–621, 2015.
- [6] Gabriel N. Gatica, Antonio Márquez, and Manuel A. Sánchez. Pseudostress-based mixed finite element methods for the Stokes problem in \mathbb{R}^n with Dirichlet boundary conditions. I: A priori error analysis. *Commun. Comput. Phys.*, 12(1):109–134, 2012.
- [7] Gabriel N. Gatica, Antonio Márquez, and Manuel A. Sánchez. A priori and a posteriori error analyses of a velocity-pseudostress formulation for a class of quasi-Newtonian Stokes flows. *Comput. Methods Appl. Mech. Engrg.*, 200(17-20):1619–1636, 2011.

- [8] Gabriel N. Gatica, Antonio Márquez, and Manuel A. Sánchez. Analysis of a velocity-pressure-pseudostress formulation for the stationary Stokes equations. *Comput. Methods Appl. Mech. Engrg.*, 199(17-20):1064–1079, 2010.

CONFERENCE TALKS

Finite element methods for high-contrast interface problems, Finite Element Circus, University of Massachusetts Dartmouth (October 16-17 2015).

Bernstein polynomial interpolation, Finite Elements Circus, George Mason University, Fairfax VA (March 27-28, 2015).

Higher-order FEM for elliptic interface problems, Minisymposia: Recent Advances in Numerical Methods for Interface Problems, SIAM CSE, Utah (March 18, 2015).

Higher-order FEM for elliptic interface problems, Finite Elements Circus, University of Minnesota, Minnesota (October 24, 2014).

On the accuracy of finite element approximations to a class of interface problems, DelMar Numerics Day, University of Maryland, Baltimore county (May 10, 2014),

Max-norm stability of low order Taylor-Hood elements in three dimensions, Valparaíso Numérico IV. Pontificia Universidad Católica de Valparaíso, Chile (December 11-13, 2013).

Max-norm Stability of low Taylor-Hood Element in three dimensions, Finite Element Circus, University of Delaware (October 18-19, 2013).

Analysis of a velocity-pressure-pseudostress formulation for the stationary Stokes equations, COMCA 2009 Numerical Analysis, Universidad Católica del Norte, Antofagasta - Chile (August 5 - 7, 2009).

OTHER TALKS AND POSTERS

Poster : *FEM for Interface Problems*, Advanced Numerical Methods in the Mathematical Sciences. Institute for Scientific Computation, Texas A&M University, College Station, TX. May 4-8, 2015.

Poster: *Higher-order FEM for the Stokes interface problem*, Minisymposium on Advances in numerical methods for interface problems, SIAM CSE, Utah (March 15, 2015).

Poster: *Higher-Order FEM to a Class of Interface Problems*, Structure-Preserving Discretizations of Partial Differential Equations, IMA, Minnesota (October 22-24, 2014).

Poster: *Finite Element Approximation to a class of Interface problems*, Robust Discretization and Fast Solvers for Computable Multi-Physics Models ICERM, Providence RI (May 12-16, 2014)

Finite element methods for interface problems Workshop on Integrating Dynamics and Stochastic, Division of Applied Mathematics, Brown University , November 7, 2014

Finite Element Approximation to a class of Interface problems, Graduate student seminar, Division of Applied Mathematics, Brown University (April 2014)

Panel : *WPI - Research Experience for Undergraduates (REU) graduate school panel*, WPI Worcester MA. July 10, 2015.

WORKSHOP ATTENDED

Nonlinear PDEs, Numerical Analysis, and Applications University of Pittsburgh, October 2-3, 2015

Fourth Chilean Workshop on Numerical Analysis and PDE's, WONAPDE, Concepción Chile (January 2013)

NSF/CBMS Conference: Finite Element Exterior Calculus (FEEC) (June 11-15, 2012)

Finite Element Circus, Rutgers University (April 2012)

Third Chilean Workshop on Numerical Analysis and PDE's, WONAPDE, Concepción Chile (January 2010)

Attended to 4st Workshop on Numerical Analysis and PDE's, SANTIAGO NUMERICO I: Santiago - Chile (January 2009)

Professional Service - Peer review in Journals

Computer Methods in Applied Mechanics and Engineering

Journal of Scientific Computing

Journal of Computational and Applied Mathematics

TEACHING EXPERIENCE

Summer	2014	REU program in Computational Mathematics, Brown University
Spring-	2014	Teaching Assistant, APMA 0330 Method of Applied Mathematics
Fall		- I, Brown University
Fall	2012	Work at the Math Resource Center (MRC), Department of Math-
Spring	2013	ematics, Brown University
Spring	2011	Teaching Assistant, Numerical Calculus, Universidad Católica de la Santísima Concepción.
Spring	2011	Lecturer, Multi-variable Calculus, Universidad Católica de la Santísima Concepción.
Fall	2010	Teaching Assistant, Numerical Calculus, Universidad Católica de la Santísima Concepción.
2008 -	2009	Teaching Assistant, Algebra and Linear Algebra, University of Concepción.
	2006	Teaching Assistant, Complemento de Cálculo, University of Concepción.

HONORS AND AWARDS

2011-2015	Becas Chile Fellowship Government of Chile for studies abroad.
2010	Thesis project funded by BASAL project CONICYT, Chile.
2004	Academic Excellence Fellowship University of Concepción granted to the top 10 entering freshmen.

GRADUATE COURSEWORK

<input type="checkbox"/> Real Analysis	<input type="checkbox"/> Spectral methods
<input type="checkbox"/> Theory of Probability	<input type="checkbox"/> Discontinuous Galerkin methods
<input type="checkbox"/> Numerical analysis	<input type="checkbox"/> Computational Fluid Dynamics
<input type="checkbox"/> Finite Element methods	<input type="checkbox"/> Bernstein-Bezier tech. in high order FEM
<input type="checkbox"/> Partial Differential Equations	<input type="checkbox"/> Introduction to high performance computing
<input type="checkbox"/> Domain decomposition and multilevel methods for FEM	

SCIENTIFIC RESEARCH EXPERIENCE

Summer 2013 Attended to Simulation Summer School.
Brown and Kobe University.

INDUSTRY EXPERIENCE

January 2009 Internship, Huachipato, Talcahuano - Chile.
July 2009 Internship, ACHS, Concepción - Chile.

RELEVANT SKILLS

Languages: Spanish, English
Scientific
program-
ming lan-
guages:
MATLAB,
C++, MPI.