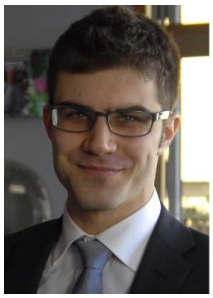
Marco Salviato

Curriculum Vitae

William E. Boeing Department of Aeronautics & Astronautics
University of Washington
Office: 311D Guggenheim Hall
P.O. Box: 352250
Seattle, WA, 98195-2400
Phone: (206) 543 2170
E-mail: salviato@aa.washington.edu



EDUCATION

- *PhD degree,* **University of Padova** (Padova, Italy), *Mechanical Engineering,* Dec 2012
  Supervisor: Prof. Marino Quaresimin.
- *M.Sc. degree,* **University of Padova** (Padova, Italy), *Mechanical Engineering,* Oct 2009.
- *B.Sc. degree*, **University of Padova** (Padova, Italy), *Mechanical Engineering,* Oct 2007.

PROFESSIONAL EXPERIENCE

- *Assistant Professor*, **University of Washington**, (Seattle, WA, USA), William E. Boeing Department of Aeronautics and Astronautics. Sept 2015-Present.
- *Research Assistant Professor*, **Northwestern University**, (Evanston, IL, USA), Department of Civil and Environmental Engineering. Sept 2014-Sept 2015.
- *Postdoctoral Associate*, **Northwestern University**, (Evanston, IL, USA), Theoretical and Applied Mechanics. Jan 2013 – Sept 2014.
  Supervisor: Prof. Zdeněk P. Bažant

HONORS AND AWARDS

- *AIAS* (Italian Association for Strain Analysis) *Juniores Prize* for the best conference paper by a single author 35 years old and younger. Sept 2012.
- *InTesi* award for innovative MSc thesis in Mechanical Engineering. Nov 2009.
- *Gold medal* of the University of Padova for the best graduate in Mechanical Engineering. Oct 2009.
- *Gold medal* of the University of Padova for the best undergraduate in Mechanical Engineering. Oct 2007.

PUBLICATIONS

(a) BOOKS, MONOGRAPHS AND BOOK CHAPTERS

[1] Quaresimin M., **Salviato M.**, Zappalorto M. Toughening Mechanisms in Nanoparticle Polymer Composites: Experimental Evidences, Modeling and Nanodesign. *In "Toughening*

Mechanisms in Composite Materials, Chapter 4, pp 113-133- Editor(s): Q. Qin & J. Ye, Woodhead Publishing, ISBN: 9781782422914

(b) JOURNAL ARTICLES

[20] **Salviato M**., S. E. Ashari, Cusatis G.. A Spectral Stiffness Microplane Model for Damage and Fracture of Textile Composites. *Under review in Composite Structures*.

[19] Kirane K., **Salviato M**., Bažant Z.P. Hierarchical multiscale microplane model for fracturing behavior of woven composites. *Under review in Journal of the Mechanics and Physics of Solids.*

[18] Su Y., Bažant Z.P., Zhao Y., **Salviato M**, Kirane K. Viscous energy dissipation of kinetic energy of particles comminuted by high-rate shearing in projectile penetration, with potential ramification to gas shale. *International Journal of Fracture; 193:77-85.*

[17] Kirane K., **Salviato M**., Bažant Z.P. Multiscale Microplane Model for Predicting Elastic Properties of Woven Fabric Composites. *Accepted for Publication in Journal of Composite Materials*. Doi: 0.1177/0021998315590264

[16] Bažant Z.P., **Salviato M**., Chau V.T., Viswanathan H., Zubelewicz A. Why Fracking Works. *Journal of Applied Mechanics*, 81,101010-1-10, (2014).

[15] **Salviato M**., Kirane K., Bažant Z.P. Statistical Distribution and Size Effect of Residual Strength after a Period of Constant Load. *Journal of Mechanics and Physics of Solids*, 64, 440-54, (2014).

[14] **Salviato M**., Bažant Z.P. The Asymptotic Stochastic Strength of Bundles of Elements Exhibiting General Stress-Strain Laws. *Probabilistic Engineering Mechanics*, 36, 1-7, (2014).

[13] Quaresimin M., **Salviato M.**, Zappalorto M. A multi-scale and multi-mechanism model for the fracture toughness of nanoparticle filled thermosetting polymers. *Composites Science and Technology*, 91, 16-21, (2014).

[12] Zappalorto M., **Salviato M**., Quaresimin M. Mixed Mode (I+ II) Fracture Toughness of Polymer Nanoclay Nanocomposites. *Engineering Fracture Mechanics*, 111, 50-64, (2013).

[11] **Salviato M**., Zappalorto M., Quaresimin M. Nanoparticle debonding strength: a comprehensive study on interfacial effects. *International Journal of Solids and Structures*, 50, 3225-3232, (2013).

[10] Zappalorto M., **Salviato M**., Pontefisso A. Quaresimin M. Notch effect in clay-modified epoxy: a new perspective on nanocomposite properties. *Composite Interfaces*, 20:(6), 405-419, (2013).

[9] **Salviato M**., Zappalorto M., Quaresimin M. Plastic shear bands and fracture toughness improvements of nanoparticle filled polymers: a multiscale analytical model. *Composites Part A*, 48, 144-152, (2013).

[8] Zappalorto M., **Salviato M**., Quaresimin M. A multiscale model to describe nanocomposite fracture toughness enhancement by the plastic yielding of nanovoids. *Composites Science and Technology*, 72, 1683-1691, (2012).

[7] Zappalorto M., **Salviato M**., Quaresimin M. Stress distributions around rigid nanoparticles. *International Journal of Fracture*, 176, 105-112, (2012).

[6] Quaresimin M., **Salviato M**., Zappalorto M. Strategies for the assessment of nanocomposite mechanical properties. *Composites part B: Engineering*, 43, 2290-2297, (2012).

[5] Quaresimin M., **Salviato M**., Zappalorto M., Fracture and interlaminar properties of clay-modified epoxies and their glass reinforced laminates. *Engineering Fracture Mechanics*, 81:80- 93, (2012).

[4] **Salviato M**., Zappalorto M., Quaresimin M. The effect of surface stresses on the critical debonding stress around nanoparticles. *International Journal of Fracture*, 172:97-103, (2011).

[3] Zappalorto M., **Salviato M**., Quaresimin M. Influence of the interphase zone on the nanoparticle debonding stress. *Composites Science and Technology*, 72, 48-55, (2011).

[2] **Salviato M**., Zappalorto M., Quaresimin M. Plastic Yielding Around Nanovoids. *Procedia Engineering*, Vol. 10, pp. 3316 – 3321, (2011).

[1] Zappalorto M., **Salviato M.**, Quaresimin M. Assessment of Debonding-Induced Toughening in Nanocomposites. *Procedia Engineering*, Vol. 10, pp. 2973 – 2978, (2011).

(c) PEER-REVIEWED ARTICLES IN INTERNATIONAL CONFERENCE PROCEEDINGS

[14] **Salviato M**., Kirane K. Bažant Z.P. Statistical Distribution and Size Effect of Residual Strength after a Period of Sustained Load. Computational Modeling of Concrete Structures-EUROC-2014, 423-28. ISBN 9781138001459.

[13] Zappalorto M., **Salviato M**., Quaresimin M. Mixed Mode Fracture Behavior of Epoxy/Nanoclay Nanocomposites. 19th International Conference on Composite Materials, Montréal, Canada, July 29- August 2, 2013. ISBN 9781629931999.

[12] Bažant Z.P., Hubler M.H., **Salviato M**., Kirane K., Le J.-L. Fracture Scaling and Safety of Quasibrittle Structures: Atomistic Basis, Computational Challenges and New Advances. The Third International Conference on Computational Modeling of Fracture and Failure of Materials and Structures, Prague, June 5-7, 2013. ISBN 9788001052792.

[11] Bažant Z.P., Hubler M.H., **Salviato M**., Le J.-L. Scaling of Failure Probability of Quasibrittle Structures with Large Cracks. 11th International Conference on Structural Safety & Reliability, New York, June 16-20, 2013. ISBN 9781138000865.

[10] Zappalorto M., **Salviato M**., Quaresimin M. Fracture Toughness and Notch Sensitivity of Clay-Epoxy Nanocomposites under Mixed Mode Loadings. 4th International Conference from Nanoparticles and Nanomaterials to Nanodevices and Nanosystems, Corfu, Greece, 16-20 June 2013.

[9] Zappalorto M., **Salviato M**., Quaresimin M. Multiscale modelling of nanocomposite fracture toughness. The International Conference on Composite Interfaces, Kyoto, Japan, 6-8 August 2012.

[8] **Salviato M**., Zappalorto M., Quaresimin M. Fracture toughness improvements due to plastic shear bands around nanoparticles. 15th European Conference on Composite Materials, Venice, Italy, 24-28 June 2012. ISBN 9788888785332.

[7] **Salviato M**., Pontefisso A., Zappalorto M., Santi M., De Rossi N., Quaresimin M. Fracture and interlaminar properties of clay-modified glass reinforced laminates. 15th European Conference on Composite Materials, Venice, Italy, 24-28 June 2012. ISBN 9788888785332.

[6] **Salviato M.**, Zappalorto M., Florio M., Dalla Via A., Quaresimin M. Mixed mode fracture toughness of cracked specimens made of nanomodified epoxy resin. 15th European Conference on Composite Materials, Venice, Italy, 24-28 June 2012. ISBN 9788888785332.

[5] Zappalorto M., **Salviato M**., Quaresimin M. Fracture toughness enhancements in nanocomposites: a multiscale model. 15th European Conference on Composite Materials, Venice, Italy, 24-28 June 2012. ISBN 9788888785332.

[4] **Salviato M**., Zappalorto M. Analytical study of the surface stress effects on the critical debonding stress around nanoparticles. 13th International Conference on Mesomechanics, Vicenza, 6-8 July 2011. ISBN 9789635086221.

[3] Quaresimin M., Zappalorto M. **Salviato M**. Improvements of composite laminates properties by nanomodification. NanotechItaly, Venice, 20-22 October 2010.

[2] Carraro P., Quaresimin M., **Salviato M**., Zappalorto M. Interlaminar properties of clay-modified epoxy-glass reinforced laminates. 14th European Conference on Composite Materials, Budapest, Hungary, 7-9 June 2010. ISBN 9789633130087.

[1] Quaresimin M., Zappalorto M. **Salviato M**. On the prediction of nanocomposites mechanical properties. 14th European Conference on Composite Materials, Budapest, Hungary 7-9 June 2010. ISBN 9789633130087.

(d) PEER-REVIEWED ARTICLES IN ITALIAN CONFERENCE PROCEEDINGS

[9] Zappalorto M., **Salviato M**., Quaresimin M. Tenacità a frattura a modo misto (I+ II) di polimeri nanorinforzati. 42° Convegno Nazionale AIAS, Salerno, 11-14 settembre 2013. ISBN 9783642126666.

[8] **Salviato M**[1]. Fracture toughness improvements of nanoparticle filled polymers due to plastic shear banding. 41° Convegno Nazionale AIAS, Vicenza, 5-8 settembre 2012. ISBN 9788897385431.

[7] Zappalorto M., **Salviato M**., Quaresimin M. Modellazione multiscala della tenacità a frattura di polimeri rinforzati con nanoparticelle. 41° Convegno Nazionale AIAS, Vicenza, 5-8 settembre 2012. ISBN 9788897385431.

[6] **Salviato M**., Zappalorto M., Quaresimin M. Studio del danneggiamento indotto dal debonding di nanoparticelle. 40° Convegno Nazionale AIAS, Palermo, 7-10 settembre 2011. ISBN 9788895272856.

[5] Zappalorto M., **Salviato M**., Quaresimin M. Modellazione dell'effetto tenacizzante indotto dalla plasticizzazione di nanovuoti. 40° Convegno Nazionale AIAS, Palermo, 7-10 settembre 2011. ISBN 9788895272856.

[4] Quaresimin M., Zappalorto M., **Salviato M**. Resistenza interlaminare di laminati in composito vetro/epossidica nanomodificati. XXXIX Convegno AIAS, Maratea, 7-10 settembre 2010. ISBN 9788860930743.

[3] **Salviato M**., Zappalorto M. Modellazione nanostrutturale del meccanismo di debonding in nanocompositi a matrice polimerica. XXXIX Convegno AIAS, Maratea, 7-10 settembre 2010.

[2] Quaresimin M., Zappalorto M. **Salviato M**. On the prediction of mechanical properties of nanocomposites, Workshop IGF, Forni di Sopra, 7-9 gennaio 2010. ISBN 9788895940298.

[1] Quaresimin M., Zappalorto M. **Salviato M**. Metodologie di modellazione delle proprietà meccaniche dei nanocompositi. XXXVIII Convegno AIAS, Torino, 9-11 settembre 2009. ISBN 9788890191619.

[1] This contribution to the AIAS (the Italian Association for Strain Analysis) conference was awarded with the "Juniores National Prize" as the best conference paper by a single author 35 years old and younger.

(e) RESEARCH AND TECHNICAL REPORTS

[1] Bažant Z.P., **Salviato M**., Chau V.T. Why Fracking Works and How to Optimize It. Department of Civil and Environmental Engineering, Northwestern University, Evanston, IL, Report No. 14-06/008w, arXiv:1406.7440 (2014).

[2] **Salviato M**., Ashari S.E., Cusatis G. Spectral Stiffness Microplane Model for Quasibrittle Textile Composites. SEGIM internal report, Northwestern University, Evanston, IL, Report No. 15-09/707S, arXiv:1509.02501 (2015).

TEACHING AND ADVISING

TEACHING

2014-2015

- Substitute lecturer "Stability Analysis of Structures" (graduate level, Civil and Environmental Engineering, Northwestern University). Lecturer: Prof. Z.P. Bažant.

2013-2014

- Substitute lecturer "Inelastic Analysis of Structures" (graduate level, Civil and Environmental Engineering, Northwestern University). Lecturer: Prof. Z.P. Bažant.
- Substitute lecturer "Cohesive Fracture and Scaling" (graduate level, Civil and Environmental Engineering, Northwestern University). Lecturer: Prof. Z.P. Bažant.

2012-2013

- Lecturing half of the course "Composite Design and Applications" (graduate level, Mechanical Engineering, University of Padova). Lecturer: Prof. Marino Quaresimin.

2011-2012

- Lecturing half of the course "Machine Design and Laboratory" (undergraduate level, Mechanical Engineering, University of Padova). Lecturer: Prof. Marino Quaresimin.
- Teaching Assistant, Laboratory Instructor, and Substitute Lecturer for the course of "Machine Design and Applications" (undergraduate level, Mechatronics Engineering, University of Padova). Lecturer: Prof. Michele Zappalorto.
- Teaching Assistant, Laboratory Instructor, and Substitute Lecturer for the course of "Composite Design and Applications" (graduate level, Mechanical Engineering, University of Padova). Lecturer: Prof. Marino Quaresimin.

2010-2011

- Teaching Assistant, Laboratory Instructor, and Substitute Lecturer for the course of "Machine Design and Laboratory" (undergraduate level, Mechanical Engineering, University of Padova). Lecturer: Prof. Marino Quaresimin.
- Teaching Assistant, Laboratory Instructor, and Substitute Lecturer for the course of "Composite Design and Applications" (graduate level, Mechanical Engineering, University of Padova). Lecturer: Prof. Michele Zappalorto.
- Teaching Assistant, Laboratory Instructor, and Substitute Lecturer for the course of "Advanced structural design by the Finite Element Method" (graduate level, Mechanical Engineering, University of Padova). Lecturer: Prof. Filippo Berto.

SERVICE

PUBLIC LECTURES

(a) INVITED LECTURES

[6] **Salviato M.** Textile Composites for Mechanical Structures: Meso-Scale Computational Modeling and Experimental Characterization of Damage and Fracturing Behavior. Lehigh University, Bethlehem, PA, USA 10 April 2015.

[5] **Salviato M.** Hydraulic Fracturing: a Mechanistic Analysis of Stability and Fluid-Driven Propagation of Complex Crack Systems. University of Houston, Houston, TX, USA 31 March 2015.

[4] **Salviato M.** A Multi-Scale Probabilistic Model of Reliability and Scaling of Quasi-Brittle Structures. University of Southern California, Los Angeles, CA, USA 4 March 2015.

[3] **Salviato M.** Meso-Scale Computational Modeling and Experimental Characterization of Damage and Fracturing Behavior of Textile Composites. University of Washington, Seattle, WA, USA 10 February 2015.

[2] **Salviato M.** Multi-Scale Probabilistic Modeling of Strength, Residual Strength and Lifetime of Quasi-Brittle Structures. Northwestern University, Evanston, IL, USA 9 October 2013.

[1] **Salviato M.** Modeling the Fracturing Behavior of Textile Composites: A Multi-scale Microplane Model. University of Padova, Vicenza, Italy, 10 September 2013.

(b) PRESENTATIONS AT INTERNATIONAL CONFERENCES

[13] “Spectral Stiffness Decomposition Microplane Model: Prediction of Crashworthiness of a Woven Composite Crash Can” ASME 2014 International Mechanical Engineering Congress & Exposition, Montreal, Canada 14-20 November 2014.

[12] "A Spectral Stiffness Microplane Model for Fracturing Behavior of Woven Composites”. Engineering Mechanics Institute Conference, Hamilton, Canada 5-8 August 2014.

[11] “A multi-scale microplane model for fracturing damage of woven composites”. 17th U.S. National Congress on Theoretical & Applied Mechanics, Michigan, USA 15-20 June 2014.

[10] “Statistical Distribution and Size Effect of Residual Strength after a Period of Sustained Constant Load”. ASME International Mechanical Engineering Congress Exposition, San Diego, USA, November 15-21, 2013.

[9] “Statistical Distribution of Residual Strength after a Period of Constant Load and Size Effect”. Engineering Mechanics Institute Conference, Evanston, USA, August 4 - 7, 2013.

[8] “Fracture toughness improvements due to plastic shear bands around nanoparticles”. 15th European Conference on Composite Materials, Venice, Italy, 24-28 June 2012.

[7] “Fracture and interlaminar properties of clay-modified glass reinforced laminates”. 15th European Conference on Composite Materials, Venice, Italy, 24-28 June 2012.

[6] “Mixed mode fracture toughness of cracked specimens made of nanomodified epoxy resin”. 15th European Conference on Composite Materials, Venice, Italy, 24-28 June 2012.

[5] “The effect of the interphase zone and surface stresses on the critical debonding stress around nanoparticles”. 4th ECNP Young Researchers Conference, Lyon, 7-10 November 2011.

[4] “Analytical study of the surface stress effects on the critical debonding stress around nanoparticles”. 13th International Conference on Mesomechanics, Vicenza, 6-8 July 2011.

[3] “Plastic Yielding Around Nanovoids”. 11th International Congress on the Mechanical Behaviour of Materials, Como, Italy, 5-9 June 2011.

[2] “Improvements of composite laminates properties by nanomodification”. NanotechItaly, Venice, 20-22 October 2010.

[1] “On the prediction of nanocomposites mechanical properties”. 14th European Conference on Composite Materials, Budapest, Hungary 7-9 June 2010.

(c) PRESENTATIONS AT ITALIAN CONFERENCES

[3] “Fracture toughness improvements of nanoparticle filled polymers due to plastic shear banding”. 41° Convegno Nazionale AIAS, Vicenza, 5-8 settembre 2012.

[2] “Studio del danneggiamento indotto dal debonding di nanoparticelle”. 40° Convegno Nazionale AIAS, Palermo, 7-10 settembre 2011.

[1] “Modellazione nanostrutturale del meccanismo di debonding in nanocompositi a matrice polimerica”. XXXIX Convegno AIAS, Maratea, 7-10 settembre 2010.

CONFERENCES AND MINI-SYMPOSIA ORGANIZATION

- Co-organizer of the 15th European Conference on Composite Materials (Venice, Italy, 24-28 June 2012).
- Co-organizer of the mini-symposium “Multiscale and Multiphysics Computational Tools for Sustainable Hydraulic Fracturing”, Engineering Mechanics Institute Conference, (Stanford University, 2015).

PEER REVIEW EXPERIENCE FOR JOURNALS AND BOOKS

Journal of the Mechanics and Physics of Solids
Composites Science and Technology
Composites part B: Engineering
Probabilistic Engineering Mechanics
ASCE Journal of Engineering Mechanics
Fatigue & Fracture of Engineering Materials & Structures
Computers and Concrete
KSCE Journal of Civil Engineering
Theoretical and Applied Fracture Mechanics
International Journal of Impact Engineering
Journal of Reinforced Plastics
Composite Structures

SOCIETY MEMBERSHIPS

American Society for Composites
American Society of Mechanical Engineers
European Society for Composite Materials