

CV of Prof. Andrea BERNASCONI

PERSONAL INFORMATION

Date of birth 27/11/1970

Nationality Italian

CONTACTS

Politecnico di Milano (Polytechnic University of Milan, Italy)

Dipartimento di Meccanica (Department of Mechanical Engineering)

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EDUCATION

- | | |
|-----------------|--|
| 1997 - 2000 | PhD
Mechanical Behaviour of Materials,
University of Pisa, Lungarno Pacinotti, 43, 56126 Pisa

Development of innovative numerical tools for the assessment of
rolling contact fatigue damage |
| 1996 (3 months) | Italian Navy Reserve Officers' training course,
Naval Academy, Livorno, Italy

Elements of naval engineering, on-board equipment, ship
propulsion |
| 1989 - 1995 | Master Degree in Mechanical Engineering,
Politecnico di Milano – Piazza Leonardo da Vinci 33 – Milano
Final mark 100/100 cum Laude

Thesis on multiaxial fatigue of metals |

WORK EXPERIENCE

- | | |
|-------------------------|---|
| 01/09/2011 - today | Associate professor,
Politecnico di Milano – Piazza Leonardo da Vinci 33 – Milano -
Italy |
| 01/07/2002 – 31/08/2011 | Assistant professor,
Politecnico di Milano – Piazza Leonardo da Vinci 33 - Milano -
Italy |
| 01/04/2000 – 31/03/2002 | Research assistant, Politecnico di Milano – Piazza Leonardo da
Vinci 33 - Milano - Italy |

1996 – 1997 (12 months) Engineering officer (Ensign/Midshipman OF-1) of the Italian Navy
Quality assurance of parts supplied to the Navy

TEACHING ACTIVITIES

- 2017/18 – today – Machine design 1 (Costruzione di Macchine 1), Politecnico di Milano, School of Industrial Engineering, Degree of Mechanical Engineering, Piacenza Campus
- 2015/16 – today - Optimal design and FEM (in English) Politecnico di Milano, School of Industrial Engineering, Master Degree of Mechanical Engineering, Piacenza Campus
- 2014/15- today: Lightweight Design of Mechanical Structures (in English), Politecnico di Milano, School of Industrial Engineering, Master Degree of Mechanical Engineering
- 2004/05 – 2013/14: Optimal Design of Mechanical Components and FEM (Progettazione ottimale e assistita di componenti meccanici), Politecnico di Milano, School of Industrial Engineering, Master Degree of Mechanical Engineering, Piacenza Campus
- 2014/15: Machine Design 2, Politecnico di Milano, School of Industrial Engineering, Master Degree of Mechanical Engineering, Piacenza Campus
- 2013/14: Finite Element Method for Mechanical Systems Design (Elementi Finiti per la Progettazione dei Sistemi Meccanici) , Politecnico di Milano, School of Industrial Engineering, Master Degree of Mechanical Engineering, Piacenza Campus
- 2008/09 – 2013/14: Computer Assisted Analysis and Modelling of Mechanical Structures (Modellazione e Calcolo Assistito di Strutture Meccaniche) Politecnico di Milano, School of Industrial Engineering, Degree of Mechanical Engineering, Piacenza Campus
- 2002/03 – 2008/09: Fundamentals of Machine Design (Fondamenti di Costruzione di Macchine), Politecnico di Milano, School of Industrial Engineering, Degree of Mechanical Engineering, Piacenza Campus

PHD THESIS SUPERVISIONS

- Azhar Jamil, “Assessment of the VCCT technique for modelling fatigue crack growth in adhesively bonded composite materials.” (2014)
- Md Kharshiduzzaman “Experimental methods for the assessment of structural integrity of composite bonded joints” (2015)
- Riccardo Galeazzi “Experimental characterization and modeling of the mechanical behaviour of particleboard” (2017)
- Rosemere de Araujo Alves Lima “Structural health monitoring of adhesive joints using optical fibres ” (2018)

INSTITUTIONAL ACTIVITIES

- 2017 – today: Deputy Head of the PhD programme in Mechanical Engineering, Politecnico di Milano
- 2011 – today: Member of the Board of the PhD programme in Mechanical Engineering, Politecnico di Milano
- 2013 – today: delegate of the Dean of the Mechanical Engineering courses for the Piacenza Campus
- 2011 - today: Secretary of the Degree board for Bachelor and Master Degrees in Mechanical Engineering, School of Industrial Engineering, Politecnico di Milano, Piacenza Campus
- 2007 - 2011 manager of Industry Internships, Mechanical Engineering, School of Industrial Engineering, Politecnico di Milano, Piacenza Campus

RESEARCH TOPICS

During several years of research and activities and collaborations with industries, a deep knowledge and expertise were gained in the following fields:

- Mechanical behaviour of reinforced polymers, with special emphasis on the fatigue behaviour of short fibre reinforced polymers
- Lightweight design of mechanical parts, with use of reinforced polymers and hybrid metal-polymer construction solutions
- Monitoring techniques for the structural integrity of composite structures and adhesive joints, mainly using optical sensors (FBG, OBR)
- Fatigue behaviour of adhesively bonded joints: testing and modelling of fatigue crack propagation
- Rolling contact fatigue of railway wheels
- Multiaxial fatigue of metals: testing and development of numerical tools for the assessment of the multiaxial fatigue strength of mechanical components
- Fatigue of welded joints: testing and modelling by local approaches

INTERNATIONAL COLLABORATIONS

P. Hine – University of Leeds (UK): Analysis of the microstructure of injection moulded, short fibre reinforced polymers

C. Nadot- Martin and S. Catagnet– ENSMA Poitiers (France): Through process modelling of the mechanical behaviour of injection moulded, short fibre reinforced polymers.

A. Slocum and R. Campbell – MIT Massachusetts Institute of Technology USA – Modelling of the mechanical behaviour of adhesive joints, also as a function of the temperature

MEMBERSHIPS:

- Member of the SPE, Society of Plastic Engineers
- Member of the ESCM, European Society for Composite Materials

MEMBERSHIP OF EDITORIAL BOARDS

2017 – Today – Member of the editorial board of The Journal of Adhesion

MEMBERSHIP OF INTERNATIONAL SCIENTIFIC BOARD OF CONFERENCES

- AB2015 – 3rd International Conference on Structural Adhesive Bonding – 2-3 July 2015
- ECCM 17 17th European Conference on Composite Materials –26-30 June 2016 - Munich (Germany)
- AB2017 – 4th International Conference on Structural Adhesive Bonding – 6-7 July 2017
- Fatigue 2018 – 27 May 2018 – Poitiers (France)
- ECCM 18 – 18th European Conference on Composite Materials 24-28 June 2018 – Athens (Greece)

LOCAL ORGANIZING COMMITTEE OF CONFERENCES

13th International Conference on Textile Composites – 17 September 2018 – Milan (Italy)

REVIEWER FOR SCIENTIFIC JOURNALS

- International Journal of Fatigue
- Composites Science and Technology
- International Journal of Adhesion and Adhesives
- Journal of Adhesion
- Composites Part A
- Composites Part B
- International Journal of Solids and Structures
- Computers and Structures
- Fatigue and Fracture of Engineering Materials and Structures
- Proceedings of the Institution of Mechanical Engineers, Part D, Journal of Automobile Engineering
- Proceedings of the Institution of Mechanical Engineers, Part L, Journal of Materials: Design and Applications
- Optical Fiber Technology
- Sensors

PUBLICATIONS

CITATIONS (up to December 2019) : **1513**

H-Index (source Scopus) **21**

PATENTS

Cortellini M., Maini P.D., Bernasconi A. Beretta S. Arm made of composite material and relative production method. United States Patent 8887763

Cortellini M., Maini P.D., Bernasconi A. Beretta S. Arm made of composite material and respective production method. EP2248755 B1

ARTICLES (published in International Archive Journals only, with Scopus/WoS ID)

- Bernasconi, A., Lima, R.A.A., Cardamone, S., Campbell, R.B., Slocum, A.H., Giglio, M. Effect of temperature on cohesive modelling of 3M Scotch-Weld™ 7260 B/A epoxy adhesive (2019) Journal of Adhesion, in press DOI: 10.1080/00218464.2019.1665519
- Cardamone, S., Bernasconi, A., Giglio, M. Characterization of the 3M Scotch-Weld™ 7260 B/A epoxy adhesive by cohesive damage models and application to a full-scale bonded sub-structure. (2019) Journal of Adhesion, in press DOI: 10.1080/00218464.2019.1591278
- Kharshiduzzaman, M., Gianneo, A., Bernasconi, A. Experimental analysis of the response of fiber Bragg grating sensors under non-uniform strain field in a twill woven composite (2019) Journal of Composite Materials 53(7), pp. 893-908
- Fouchier N., Nadot-Martin C., Conrado E., Bernasconi A., Castagnet S. Fatigue life assessment of a Short Fibre Reinforced Thermoplastic at high temperature using a Through Process Modelling in a viscoelastic framework (2019) International Journal of Fatigue, 124 , pp. 236-244.
- Bernasconi, A., Cardamone, S., Giglio, M. Experiments on the combined use of a double-sided pressure-sensitive tape and an epoxy adhesive to reduce handling time (2018) Journal of Adhesion Science and Technology, 32 (15), pp. 1687-1699.
- Bernasconi A, Kharshiduzzaman M, Comolli L. Strain Profile Measurement for Structural Health Monitoring of Woven Carbon-fiber Reinforced Polymer Composite Bonded joints by Fiber Optic Sensing Using an Optical Backscatter Reflectometer. The Journal of Adhesion (2016) 92(6), 440-458
- Bernasconi A, Carboni M; Comolli L.; Galeazzi R, Gianneo A, Kharshiduzzaman M. Fatigue Crack Growth Monitoring in Composite Bonded Lap Joints by a Distributed Fibre Optic Sensing System and Comparison with Ultrasonic Testing. The journal of Adhesion (2016), 92(7-9), 739-757
- A Bernasconi, E Conrado, P Hine. An experimental investigation of the combined influence of notch size and fibre orientation on the fatigue strength of a short glass fibre reinforced polyamide 6 Polymer Testing 47 (2015), 12-21
- A Bernasconi, M Kharshiduzzaman, L Comolli, Strain Profile Measurement for Structural Health Monitoring of Woven Carbon-Fiber Reinforced Polymer Composite Bonded Joints by Fiber Optic Sensing Using an Optical Backscatter Reflectometer, The Journal of Adhesion, 92:440–458, 2015
- A. Bernasconi, D. Taylor, F. Cosmi. Analysis of the fatigue properties of different specimens of a 10% by weight short glass fibre reinforced polyamide 6.6. Polymer Testing 40 (2014) 149-155.
- P Maressa, L Anodio, A Bernasconi, AG Demir, B Previtali. Effect of Surface Texture on the Adhesion Performance of Laser Treated Ti6Al4v Alloy. The Journal of Adhesion 91 (2014), 518-537

- A Pirondi, G Giuliese, F Moroni, A Bernasconi, A Jamil. Comparative Study of Cohesive Zone and Virtual Crack Closure Techniques for Three-Dimensional Fatigue Debonding. *The Journal of Adhesion* 91 (2014) 457-481
- A Bernasconi, M. Kharshiduzzaman, LF Anodio, M Bordegoni, GM Re, F Braghin, L Comolli. Development of a Monitoring System for Crack Growth in Bonded Single-Lap Joints Based on the Strain Field and Visualization by Augmented Reality. *The Journal of Adhesion* 90 (2014) 496-510
- F Cosmi, A Bernasconi. Micro-CT investigation on fatigue damage evolution in short fibre reinforced polymers. *Composites Science and Technology* 79 (2013) 70-76
- Bernasconi, A. Jamil, F. Moroni, A. Pirondi. A study on fatigue crack propagation in thick composite adhesively bonded joints. *International Journal of Fatigue* 50 (2013) 18–25
- Bernasconi, F. Cosmi, P.J. Hine. Analysis of fibre orientation distribution in short fibre reinforced polymers: A comparison between optical and tomographic methods. *Composites Science and Technology* 72 (2012) 2002–2008
- R. Ghelichi, A. Bernasconi, M. Guagliano. Geometrical optimization of notches under multi-axial fatigue loading. *International Journal of Fatigue* 33 (2011) 985–991
- F. Cosmi, A. Bernasconi, N. Sodini. Phase contrast micro-tomography and morphological analysis of a short carbon fibre reinforced polyamide . *Composites Science and Technology*, 71:23-30 (2011)
- Bernasconi, S. Beretta, F. Moroni, A. Pirondi. Local stress analysis of the fatigue behaviour of adhesively bonded thick composite laminates. *The Journal of Adhesion* 86(2010):480-500
- Bernasconi, F. Cosmi, E. Zappa. Combined effect of notches and fibre orientation on fatigue behaviour of short fibre reinforced polyamide. *Strain* 46 (2010):435-445
- Bernasconi, P. Davoli, C. Armanni. Fatigue strength of a clutch pedal made of reprocessed short glass fibre reinforced polyamide. *Int J Fatigue* 32 (2010):100-107
- S. Beretta, A. Bernasconi and M. Carboni. Fatigue assessment of root failures in HSLA steel welded joints: a comparison among local approaches , *Int J Fatigue*, Vol. 31 (1), pp 102-110, 2009
- Bernasconi, R.M. Kulin. Effect of frequency upon fatigue strength of a short glass fibre reinforced polyamide 6: a superposition method based on cyclic creep parameters. *Polymer Composites*, Vol. 30 (2), pp 154-161, 2009
- Bernasconi, F. Cosmi and D. Dreossi. Local anisotropy analysis of injection moulded fibre reinforced polymer composites, *Composites Science and Technology* 68 (2008) 2574–2581
- Bernasconi, P. Davoli, D.Rossin, C. Armanni. Effect of reprocessing on the fatigue strength of a fiberglass reinforced polyamide. *Composites Part A*, Vol. 38(3), pp 710-718, 2007
- Bernasconi, P. Davoli, A. Basile, A. Filippi. Effect of fibre orientation on the fatigue behaviour of a short glass fibre reinforced polyamide-6. *Int J Fatigue*, Vol .29 (2), pp 199-208, 2007
- H. Desimone, A. Bernasconi, S. Beretta. Are multi-axial fatigue criteria appropriate when steels with surface defects are subjected to RCF. *Journal of ASTM International* 3(10) 2006
- Bernasconi, M. Filippini, S. Foletti. Multi-axial fatigue of a railway wheel steel under non-proportional loading. *Int J Fatigue*, Vol 28/5-6, pp 663-672, 2006

- H. Desimone, A. Bernasconi, S. Beretta. On the application of Dang Van criterion to rolling contact fatigue. *Wear*, Vol 260/5-6, pp 567-572, 2006
- Bernasconi, I.V. Papadopoulos. Efficiency of algorithms for shear stress amplitude calculation in critical plane class fatigue criteria, *Computational Materials Science*, Vol. 34, pp 355-368, 2005
- Bernasconi, P. Davoli, M. Filippini, S. Foletti, An integrated approach to rolling contact sub-surface fatigue assessment of railway wheels, *Wear*, Vol. 258/7-8, pp 973 980, 2005
- Bernasconi, P. Davoli, M. Filippini, S. Foletti, I.V. Papadopoulos. Independence of the torsional fatigue limit upon a mean shear stress. *Int J Fatigue*, Vol. 25, pp 471–480, 2003
- Bernasconi, Efficient algorithms for calculation of shear stress amplitude and amplitude of second invariant of the stress deviator in fatigue criteria applications, *Int J Fatigue*, Vol. 24, pp. 649-657, 2002
- I.V. Papadopoulos, P. Davoli, C. Gorla, M. Filippini, A. Bernasconi, A comparative study of multiaxial high-cycle fatigue criteria for metals, *Int J Fatigue*, vol.19 No. 3, pp. 219-235, 1997

Book Chapters

- A. Bernasconi, Md. Kharshiduzzaman. Fatigue crack growth monitoring of bonded composite joints. In *Adhesives. Mechanical properties, Technologies and Economic Importance*, pp. 93-119, D. Croccolo editor, Nova Science Publishers, 2014
- A. Pirondi, G. Giuliese, A. Bernasconi, A. Jamil. Simulating the mixed-mode fatigue delamination/debonding in adhesively-bonded composite joints, in *Fatigue and fracture of adhesively bonded composite joints: Behaviour, simulation and modelling*, A.P. Vassilopoulos editor, Woodhead Publishing, 2014.