GENERAL INFORMATION **Daniele BOTTO**

EDUCATION

1995 Doctoral degree in Machine Design
Politecnico di Torino
PhD dissertation title: *Design of a manipulator with non-conventional kinematics and methods for dynamic identification*.

1991 Master degree in Aerospace Engineering.
Politecnico di Torino
Graduate thesis title*: Estimation of helicopter performances and their correlation with flight testing data.*

WORK EXPERIENCE

From 2014 till today Associate Professor at Department of Mechanical & Aerospace Engineering of Politecnico di Torino

From 1998 to 2104 Assistant Professor at Department of Mechanical & Aerospace Engineering of Politecnico di Torino

From 1994 to 1998 Employed in the Research&Development department of the Fiat Ferroviaria Company.
Role: simulations and testing on railway dynamic; experimental analysis of the wheel/rail contact oriented toward the reduction of the wheel wear.

INTERNATIONAL PROJECTS

From 2017 JIJM, a Joint Innovation lab on Joints Mechanics on Contact mechanics, Wear mechanics, Numerical modeling of friction damped system, Nonlinear dynamics of structure with localized nonlinearity. In collaboration with Northwestern Polytechnical University (NPU), School of Astronautics, Xi'an, China.
Role: Principal Investigator.

From 2008 to 2013 **FUTURE**, Flutter-Free Turbomachinery Blades. 2008-2011. EU FP7 Small or medium-scale focused research project, Priority 4 Aeronautics and Space.
Role: Principal Investigator.

From 2017 to 2021 **EXPERTISE**, models, EXperiments and high PERformance computing for Turbine mechanical Integrity and Structural dynamics in Europe. Horizon 2020 {Marie Sktodowska-Curie Innovative Training Networks.
Role: Partner.

From 2008 to 2011 **DREAM**, valiDation of Radical Engine Architecture systems. 2008-2011. EU FP7 Large-scale Integrating Project, Priority 4 Aeronautics and Space.
Role: Partner.

From 2006 to 2008 **VITAL**, EnVIronmenTALly Friendly Aero Engine. EU FP6 Integrated Project, Priority 4 Aeronautics and Space.
Role: Partner.

NATIONAL PROJECTS

From 2015 to 2017 **MIUR CLUSTER** - Title: *Greening the Propulsion Low Pressure Turbine Platform*.
Role: Partner.

From 2007 to 2008 **PRIN-MIUR** – Title: *Models and design criteria for turbomachines with mistuning caused by dampers*.
Role: Partner.

From 2003 to 2004 **PRIN-MIUR** – Title: *Methods to Design Bladed Disks in Aeroengines: Contact Parameters, Contact Model, Damper Model, Numerical Model of Blade Sectors with Underplatform Damper.*
Role: Partner

REGIONAL PROJECTS Funded by Regione Piemonte within The Distretto Aerospaziale Del Piemonte.

From 2012 to 2015 **GREAT 2020 Fase 2** – Title: *GReen Engine for Air Traffic 2020 - Step 2*.
Role: Partner

From 2009 to 2012 **GREAT 2020** – Title: *GReen Engine for Air Traffic 2020*
Role: Partner.

From 2008 to 2010 **CORALE** – Title: *Development of an integrated simulation system for the collaborative design of a low environment impact aeroengine.*
Role: Partner.

UNIVERSITY PROJECTS

From 2018 to 2021 **Joint research projects with top universities (Call 2018)** – Title*: Increasing Safety of turbine disk in Aerospace Engine (INSAnE)*. Joint Research Projects with Samara National Research University, Samara, Russian Federation.
Role: Principal investigator.

From 2018 to 2021 **Joint research projects with top universities (Call 2017)** – Title*: EXperimental and THEoretical iNvestigation of jointED structures (EXTHENdED)*. Joint Research Projects with Northwestern Polytechnical University – School of astronautics, Xi'an, Cina.
Role: Principal investigator.

From 2015 to 2016 **Joint Projects for the Internationalization of Research (Call 2014)** – Title: *Dynamics of multi-stage bladed disks with nonlinear inter-stage coupling*. Joint research project with University of Michigan.
Role: Principal investigator.

From 2004 to 2007 **LAQ** – Title: *Politecnico High Quality Laboratory Project: STRUCTURAL AND AERO MECHANICAL LABORATORY*
Role: Partner

PATENT

Reduced-wear wheel profile for tramway vehicles
Classification - international: B60B17/00 - cooperative: B60B17/00.
Role: Inventor

RESEARCH GRANTS

From 2017 to 2018 **Research Grant 484/2017 - GE Avio Srl** – Title: *Analysis of low cycle fatigue behavior of disk slot in dovetail attachment.*
Role: Grant leader

From 2016 to 2018 **Research Grant 646/2016 – Ansaldo Energia SpA** – Title*: advanced tools for numerical simulation and optimization of dovetail and fir-tree attachments of bladed disk.*
Role: Grant leader

From 2016 to 2017 **Research Grant 369/2014 - GE Avio Srl** – Title: *High temperature wear test on coating for single crystal superalloy for turbine blades.*
Role: Grant leader

2015 **Research Grant 225/2015 - GE Oil&Gas NP Srl** – Title: *Tribological study at high temperature of low wear coating for Z-notch in turbine blades.*
Role: Grant leader

From 2014 to 2015 **Research Grant 347/2014 - GE Oil&Gas NP Srl** – Title: *Development of a numerical model and experimental testing to determine the damping and the frequency shift induced by underplatform dampers on high pressure stage of a gas turbine (Jupiter)*.
Role: Grant leader

From 2013 to 2014 **Research Grant 232/2014 - GE Oil&Gas NP Srl** – Title: *Development of a model to simulate wear on shrouds of the control stage of a steam turbine*.
Role: Grant leader

From 2013 to 2014 **Research Grant 008/2014 - GE Avio Srl** – Title: *Wear test on coating T800 applied to GE90 – Step 2*
Role: Grant leader

2008 **Research Grant n° 632/08 – FIREMA S.p.A** – Title: *Models for linear railway dynamics*.
Role: Grant leader

2006 **Research Grant n° 344/06 – FATAHUNTER** – Title: *Finite Element Model of hot-rolling roller*.
Role: Grant leader

From 2013 to 2015 **Research Grant 523/13 – Ansaldo Energia SpA** – Title*: Development of methods to determine resonant frequencies of turbine blades with underplatform dampers.*
Role: Partner.

From 2011 to 2013 **Research Grant 890/2011 - GE Oil&Gas NP Srl** – Title: *Tests to characterize contact parameters and wear behavior of shrouds on low pressure blades*.
Role: Partner

From 2007 to 2010 **Research Grant 563/07 - AVIO Group** – Title: *Combined Cycle Fatigue testing on CMSX4. Within the Sixth Framework European Programme PREMECCY*.
Role: Partner

From 2007 to 2008 **Research Grant 357/07 - AVIO Group** – Title: *Dynamic Analysis of a Bladed Disk with Asymmetry (MISTUNING)*.
Role: Partner

From 2007 to 2008 **Research Grant 356/07 - AVIO Group** – Title: *Development of Models to Evaluate the Dynamic Response in Critical Components of Turbomachines*.
Role: Partner

From 2005 to 2006 **Research Grant 759/05- AVIO Group** – Title: *Tribological Investigation at a High Temperature to Evaluate Damping and Wear for Material Used in Aerospace Industry*.
Role: Partner

From 2004 to 2005 **Research Grant 481/04- AVIO Group** – Title: *Numerical and Experimental Evaluation of Undeplatform Damping in First Stage of LMS100 IPT Turbine*.
Role: Partner.

From 2001 to 2004 **Research Grant 103/01- AVIO Group** – Title: *Optimisation of Fatigue and Vibrational Behaviour of Critical Components in Turbomachines*
Role: Partner

From 1997 to 2000 **Research Grant 1130/97- AVIO Group** – Title: *Analysis of Structural behaviour of Turbomachine blades*.
Role: Partner

INTERNATIONAL TEACHING

Academic Years 2009-2011-2012 **Machine Design I**
Tong Ji University of Shanghai, PRC.
Role: Course leader.

Academic Years 2009-2011-2012 **Machine Design II**
Tong Ji University of Shanghai, PRC.
Role: Course leader.

MAIN PUBLICATIONS

Journal

2019. Fretting wear of alloy steels at the blade tip of steam turbines. DOI: 10.1016/j.wear.2019.01.039. In Wear, Volume 426-427, Pages 735-740.
Lavella, Mario; Botto, Daniele

2019. Innovative adaptive penalty in surrogate-assisted robust optimization of blade attachments. DOI: 10.1007/s00707-019-02422-x. In Acta Mechanica.
Alinejad, Fahrad; Botto, Daniele.

2018. Fretting fatigue analysis of additively manufactured blade root made of intermetallic Ti-48Al-2Cr-2Nb alloy at high temperature. DOI:10.3390/ma11071052. In Materials, Volume 11, Issue 7.
Lavella, Mario; Botto, Daniele

2018. A novel test rig to investigate under-platform damper dynamics. DOI:10.1016/j.ymssp.2017.07.046. pp.344-359. In MECHANICAL SYSTEMS AND SIGNAL PROCESSING - ISSN:0888-3270 vol. 100
Botto, Daniele; Umer, Muhammad
2018. An Experimental Investigation of the Dynamics of a Blade with Two Under-Platform Dampers. DOI:10.1115/1.4037865. In JOURNAL OF ENGINEERING FOR GAS TURBINES AND POWER - ISSN:0742-4795
Botto, Daniele; Gastaldi, Chiara; Gola, Muzio; Umer, Muhammad

2015. A numerical method to solve the normal and tangential contact problem of elastic bodies. DOI:10.1016/j.wear.2015.02.046. pp.629-635. In WEAR - ISSN:0043-1648 vol. 330-331
Botto, Daniele; Lavella, Mario

2014. High Temperature Tribological Study of Cobalt-based Coatings Reinforced with Different Percentages of Alumina. DOI:10.1016/j.wear.2014.06.024. pp.89-97. In WEAR - ISSN:0043-1648 vol. 318
Botto, Daniele; Lavella, Mario

2013. Design of a high-precision, flat-on-flat fretting test apparatus with high temperature capability.. DOI:10.1016/j.wear.2013.01.066. pp.1073-1081. In WEAR - ISSN:0043-1648
Lavella Mario; Botto Daniele; Gola Muzio

2011. Fretting wear characterization by point contact of Nickelsuperalloy interfaces. DOI:10.1016/J.wear.2011.01.064. pp.1543-1551. In WEAR - ISSN:0043-1648 vol. 271 (9-10)
Lavella Mario; Botto Daniele

2011. A new reduction technique for thermal models with fluid networks. DOI:10.1080/01495739.2010.550826. pp.667-686. In JOURNAL OF THERMAL STRESSES - ISSN:0149-5739 vol. 34 (7)
Zucca Stefano; Botto Daniele; Gola Muzio

2010. Fretting damage of contact interfaces of CMSX-4 with and without T800 coating. DOI:10.4028/www.scientific.net/KEM.417-418.553. pp.553-556. In KEY ENGINEERING MATERIALS - ISSN:1013-9826 vol. 417-418
Lavella Mario; Botto Daniele; Gola Muzio

2007. Reduced-Order Models for the Calculation of Thermal Transients of Heat Conduction/Convection FE Models.. DOI:10.1080/01495730701415806. pp.819-839. In JOURNAL OF THERMAL STRESSES - ISSN:0149-5739 vol. 30
Botto Daniele; Zucca Stefano; Gola Muzio

2006. Modelling of TBC system failure: Stress distribution as a function of TGO thickness and thermal expansion mismatch. DOI:10.1016/j.engfailanal.2004.12.027. pp.409-426. In ENGINEERING FAILURE ANALYSIS - ISSN:1350-6307 vol. 13
Martena Manuela.; Botto Daniele; Fino Paolo. Sabbadini Silvia.; Gola Muzio; Badini Claudio

2003. A methodology for on-line calculation of temperature and thermal stress under non-linear boundary conditions. pp.21-29. In INTERNATIONAL JOURNAL OF PRESSURE VESSELS AND PIPING - ISSN:0308-0161 vol. 80 (1)
Botto Daniele; Zucca Stefano; Gola Muzio

2004. Faster on-line calculation of thermal stresses by time integration. DOI:10.1016/j.ijpvp.2004.03.012. pp.393-399. In INTERNATIONAL JOURNAL OF PRESSURE VESSELS AND PIPING - ISSN:0308-0161 vol. 81 (5)
Zucca Stefano; Botto Daniele; Gola Muzio

2001. On theoretical limits of dynamic model updating using a sensitivity-based approach. pp.583-595. In JOURNAL OF SOUND AND VIBRATION - ISSN:0022-460X vol. 244(4)
Somà Aurelio; Gola Muzio; Botto Daniele