

CURRICULUM VITAE

PERSONAL INFORMATION

Name	LANCINI MATTEO
Address	VIA ALBERTANO DA BRESCIA, 20 – 25017 LONATO DEL GARDA (BS) -- ITALY
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E-mail	matteo.lancini@unibs.it
Nationality	Italian
Birth date	8.6.1978

SHORT DESCRIPTION

Matteo Lancini,
was born in **Brescia on 8.6.1978**;
since 1998 to 2004 he worked with many private firms to develop IT services
for industries and research centres in the manufacturing field.
Graduated in **Mechanical Engineering in 2005** at University of Brescia, with a
grade of 105/110, with a thesis on numerical simulation of viscoelastic
element behavior using a particle-based model.
Received his **PhD in Applied Mechanics** in April 2015, with a thesis on
Measurement systems for robotic rehabilitation.
since October 2005 to December 2008 worked as **research contractor**
developing novel methods to assess and reduce uncertainty contributions
given by geometrical tolerances and poor environmental conditions in
mechanical measurement.
Since December 2008 is an ASSISTANT PROFESSOR at the University of
Brescia, in the scientific field ING-IND/12 “Mechanical and Thermal
Measurements” specializing in measurement analysis techniques for very
low controlled environments and uncertainty assessment.
Since 2009 is member of the school council of PhD school in Sciences
Technologies and Measurements for Space of the University of Padua.
Since 2013 is a member of the International Society of Biomechanics

RESEARCH FIELDS

TEST BENCH FOR VIBRATIONS AND IMPULSIVE LOAD CHARACTERIZATION

Different research projects, funded by industrial partners, were carried on to develop or improve test benches for experimental material characterization, working under impulsive conditions or subject to vibrations. New bench designs, based on uncertainty budget analysis, were developed to optimize the measurement capability.

INDUSTRIAL DIAGNOSTICS

Using an operational modal analysis approach a set of mathematical and technical tools were developed to identify defects and damages in a solid body using acceleration data. Particular care was taken to ensure such methods could be implemented on the field, without requiring a tightly controlled environment.

MEASUREMENTS FOR BIOMECHANICS

In collaboration with other research departments and clinical practices, different measurement systems were developed to acquire forces and movements of the human body, especially in the field of rehabilitation, biomechanics and human observation. In most cases ad-hoc experimental measurement benches and suitable biomechanical models were created to assess loads and movements of internal features of the human body.

PUBLIC FUNDED RESEARCH PROJECTS

- 2016-2018 PRD 2015
SMoCCT – *Smart Monitoring of Cyclic-Contact Tests*
Characterizing railway steel using vibrations and high speed image processing
Duration: 24 months. Budget 19 000 €
- 2013-2015 PID 2012
Monster&Co - *MONitoraggio di STrutture Edili mediante Raggi Cosmici*
Monitoring civilian buildings using cosmic rays
Duration: 24 months. Budget 18 500 €
- 2013-2015 PID 2012
3M - *Influenza della Microstruttura del Materiale nelle lavorazione di Microfresatura*
Influence of Material Microstructure in Micromachining operations
Duration: 24 months. Budget 18 750 €
- 2010-2013 Industria 2015
MICHELANGELO – Incremento del livello di automazione, autodiagnosi, precisione e integrazione funzionale delle macchine utensili italiane mediante sistemi cognitivi artificiali che realizzano processi di percezione/decisione.
Automation, auto diagnosis, accuracy and integration enhancement for Italian heavy manufacturing industries using artificial intelligence system
duration: 36 months. Budget 728 000 €
- 2011- PID 2011

- 2012 **INCON - *Valutazione dell'effetto delle inclusioni non metalliche sulla vita a fatica di componenti soggetti a contatto ciclico***
 Evaluation of life span reduction due to non-metallic inclusions in elements subjects to rolling contact fatigue
 duration: 24 months. Budget 13 000 €
- 2011- **PRD 2011**
 2012 **BIOatBeSt – *Caratterizzazione sperimentale del comportamento meccanico di tessuti biologici e materiali per applicazioni biomedicali.***
 Experimental characterization of mechanical properties of biological tissues and biomedical application targeted materials
 duration: 24 months. Budget 15 000 €

INDUSTRY FUNDED RESEARCH

- 2016- **Weightpack – Goito (MN), Italy**
 2017 Modal Analysis of transfer machines implementing in-line weighing
- 2016- **Beretta Armi – Gardone Val Trompia(BS), Italy**
 2017 Biomechanical related research activity covered by non-disclosure trade agreement.
- 2015- **Sicurlive group – Ospitaletto (BS), Italy**
 2016 Development of a test bench for safety devices against falls
- 2012- **Lucchini RS – Lovere (BG)**
 2015 Improvement of a bi-disk test bench for railway components
- 2013 **Franchini Acciai – Mairano (BS), Italy**
 Vibration related research activity covered by non-disclosure trade agreement
- 2010- **Brescia Trasporti - Brescia (BS), Italy**
 2012 Human vibrational comfort evaluation on the local public transport network.
- 2009- **Thales Alenia Space – Vimodrone (MI), Italy**
 2011 Alignment verification, uncertainty budget, assembly procedures and satellite integration for the LISA pathfinder project.
- 2010- **SMI Group – San Pellegrino (BG), Italy**
 2011 Vibration analysis on systems for bottles packing and transfer.
- 2010- **Cooperativa Cavatori Valverde - Botticino (BS), Italy**
 2011 Non destructive diagnostical system for in-situ evaluation of stone elements.
- 2010 **Porta Solutions – Villa Carcina (BS), Italy**
 Transfer machine vibrational analysis to enhance accuracy and speed.
- 2009- **Beretta Armi – Gardone Val Trompia(BS), Italy**
 2010 Biomechanical related research activity covered by non-disclosure trade agreement.

CLINICAL COLLABORATIONS AND PROJECTS

Since 2011	Domus Salutis – Brescia - Italy Rehabilitation centre	<i>HandBike</i> development of a force measurement system for an augmented hand-bike training device jointly developed by University and Hospital
Since 2012	Habilita – Zingonia (BG)- Italy Rehabilitation centre	<i>Lokomat</i> analysis of EMG signals in correlation with kinematic gait analysis to assess mid-term effectiveness of rehabilitation device
Since 2012	Villa Beretta – Costa Masnaga (LC) - Italy Rehabilitation centre Domus Salutis – Brescia - Italy Rehabilitation centre	<i>Rewalk</i> development of an augmented crutch with force measuring capabilities and measurement analysis to evaluate exoskeleton users capability during initial training.
Since 2013	Ospedale San Gerardo – Monza (MB)- Italy Public Hospital.	<i>Geo</i> development of a vision system focused on lower limbs to evaluate rehabilitation device effects on patients.

MAIN PUBLICATIONS

Azizpour, G., Lancini, M. et al. (2017) **Dynamic analysis of handcycling: Mathematical modelling and experimental tests**, *Mechanisms and Machine Science* 47, pp. 33-40

Lancini, M., Serpelloni, M., Pasinetti, S., Guanziroli, E. (2016) **Healthcare Sensor System Exploiting Instrumented Crutches for Force Measurement during Assisted Gait of Exoskeleton Users** *IEEE Sensors Journal* 16 (23), A8228, pp. 8228-8237

Serpelloni, M., Tiboni, M., Lancini, M et al. (2016) **Preliminary study of a robotic rehabilitation system driven by EMG for hand mirroring** *IEEE International Symposium on Medical Measurements and Applications, MeMeA 2016 – Proceedings* 7533730

Bodini, I., Sansoni, G., Lancini, M., Pasinetti, S., Docchio, F. (2016) **A novel optical apparatus for the study of rolling contact wear/fatigue based on a high-speed camera and multiple-source laser illumination** *Review of Scientific Instruments* 87 (8), 083701

Pasinetti, S., Bodini, I., Sansoni, G, Lancini, M. et al. (2016) **A fast autofocus setup using a liquid lens objective for in-focus imaging in the macro range** *AIP Conference Proceedings* 1740, 050003

Mazzù, A., Petrogalli, C., Lancini, M., Ghidini, A., Faccoli, M. (2016) **Rolling contact fatigue assessment of railway wheel steels with wet contact**, *Civil-Comp Proceedings* 110

Sardini, E., Serpelloni, M., Lancini, M. (2015) **Wireless Instrumented Crutches for Force and Movement Measurements for Gait Monitoring**, *IEEE Transactions on Instrumentation and Measurement* 64 (12), 7222446, pp. 3369-3379

Mazzù, A., Solazzi, L., Lancini, M., Petrogalli, C., Ghidini, A., Faccoli, M. (2015) **An experimental procedure for surface damage assessment in railway wheel and rail steels** *Wear*, 342-343, pp. 22-32.

Pasinetti, S., Lancini, M., Bodini, I., Docchio, F (2015) **A Novel Algorithm for EMG Signal Processing and Muscle Timing Measurement** *IEEE Transactions on Instrumentation and Measurement* , 64 (11), 7117418, pp. 2995-3004

Borboni, A., Lancini, M. (2015) **Commanded motion optimization to reduce residual vibration** *Journal of Vibration and Acoustics, Transactions of the ASME*, 137 (3), art. no. A1.

Lancini, M., Bodini, I., Pasinetti, S., Vetturi, D. (2014) **Mimo non-linear sensors calibration based on genetic algorithms** *11th IMEKO TC14 Symposium on Laser Metrology for Precision Measurement and Inspection in Industry, LMPMI 2014*, pp. 116-119.

Borboni, A., Pandini, S., Cambiaghi, D., Lancini, M., Adamini, R., Faglia, R., Bodini, I., Vetturi, D., Dassa, L., Riccò, T., Esposito, M.D., Paderni, K., Messori, M., Pilati, F., Toselli, M (2014) **Experimental kinematics of a special shape actuator** *ASME 2014 12th Biennial Conference on Engineering Systems Design and Analysis, ESDA 2014*, 3, .

Lancini, M., Bodini, I., Pasinetti, S., Vetturi, D. (2014) **Definition of a measurability threshold of geometric tolerances in relation to measurement uncertainty and dimensional parameters** *11th IMEKO TC14 Symposium on Laser Metrology for Precision Measurement and Inspection in Industry, LMPMI 2014*, pp. 323-326.

Borboni, A., Lancini, M., Faglia, R (2014). **Residual vibration reduction with commanded motion optimization** *ASME 2014 12th Biennial Conference on Engineering Systems Design and Analysis, ESDA 2014*, 2

Sardini, E., Serpelloni, M., Lancini, M., Pasinetti, S. (2014) **Wireless instrumented crutches for force and tilt monitoring in lower limb rehabilitation** *Procedia Engineering*, 87, pp. 348-351.

Bodini, I., Lancini, M., Pasinetti, S., Vetturi, D. (2013) **Techniques for on-board vibrational passenger comfort monitoring in public transport** *12th IMEKO TC10 Workshop on Technical Diagnostics: New Perspective in Measurements, Tools and Techniques for Industrial Applications, Proceedings*

D. Vetturi, M. Lancini, I. Bodini and S. Pasinetti (2013). **Relationship between measurement uncertainty and verifiability of geometric specifications: the case study of drilled hole orthogonality**. *International Journal of Metrology and Quality Engineering*, 4, pp 35-39. doi:10.1051/ijmqe/2012035.

L. Solazzi, C. Petrogalli, M. Lancini (2012) **Rolling contact fatigue detected by correlation between experimental and numerical analyses**. *Structural Durability and Health Monitoring* vol.8 issue 4, 2012

David Vetturi, Matteo Lancini, Ileana Bodini, Arnaldo Delli Carri (2011) **Mathematical method for the definition of a non linear multi input - one output calibration diagram of laser positioning sensor**. :AMCTM 2011, Goteborg,

Matteo Lancini, Luigi Solazzi, Candida Petrogalli, David Vetturi, Ileana Bodini (2011). **Vibration-based diagnostics on a rolling contact fatigue test bench.**, In:International Workshop on Analysis of Dynamic Measurements. June 2011, Goteborg,

Foletti C., Farisé S., Grassi B., Strazza D., Lancini M., Poesio P. (2011). **Experimental investigation on two-phase air/high-viscosity-oil flow in a horizontal pipe.** CHEMICAL ENGINEERING SCIENCE (ISSN:0009-2509). 5968- 5975. 66;

L. Solazzi, C. Petrogalli, M. Lancini (2011). **Vibration based diagnostics on rolling contact fatigue test bench.** Elsevier Ltd., -- -, In:11th International Conference on the Mechanical Behaviour of Materials . 5-9 June, Milano _ Italy,

Matteo Lancini, Cinzia Amici, Claudio Breda (2010). **Measurement Techniques and Characterization of High Speed Moving Objects.** Military College - Cairo, Cairo: -- -, :INTERNATIONAL CONFERENCE ON APPLIED MECHANICS AND MECHANICAL ENGINEERING. 25.6.2010, Cairo,

D. Vetturi, M. Lancini, I. Bodini (2010). **How geometrical tolerances affect the measurement of reciprocal alignment of two different assemblies: a case study.** ASME, -- -, IASME 2010 10th Biennial Conference on Engineering Systems Design and Analysis ESDA2010. Volume 2, 2010

Matteo Lancini;Ileana Bodini;David Vetturi (2009). **Enhancing micropositioning accuracy of a six axis hexapod through uncertainty evaluation.** Danube Adria Association for Automation & Manufacturing, Vienna: 0529- 0530, Intelligent Manufacturing & Automation: Focus on theory, practice and education. 25-28.11.2009, Vienna,

D. VETTURI; M. LANCINI; I. BODINI; A. CLERICI (2008). **Marble quality assessment by vibration measurements: a preliminary study.** -, -- -, 2nd International Congress Dimension Stones. May, 29th - 31st 2008, Carrara (Italy),

D. VETTURI; A. MAGALINI; M. LANCINI; I. BODINI (2007). **Evaluation of the felt comfort on a bus: a preliminary study.** DAAAM International, VIENNA: 095- 096, vol.1, In:DAAAM Symposium. 24-27 October 2007, Zadar - HR,

Gadola Marco, Gandini Devid, Lancini Matteo, Morbioli Stefano (2007). **Development of a graphic tool for tracing Formula 1 driving lines along a racing circuit for safety purposes.** ADM - Associazione Nazionale Disegno di Macchine, -- -, XVI ADM-XIX INGEGRAF International Conference. June 2007, Perugia,

D. VETTURI; A. MAGALINI; M. LANCINI; I. BODINI (2007). **Accelerated fatigue life tests for rubber to metal devices.** YSEMS, -- -, YSESM. May, 9-12 2007, Vrnjacka Banja,

D. VETTURI; A. MAGALINI; M. LANCINI (2006). **Discrete models for the simulation of rubber components dynamics.** C.A. Mota Soares et.al., LISBON: -- -,:European Conference on Computational Mechanics Solids Structures and Coupled Problems in Engineering. 5-8 June 2006, Lisbon,

D. VETTURI; A. MAGALINI; M. LANCINI (2006). **Numerical Simulation of Rubber Devices Dynamics by Discrete Modelling.** -, -- -,:ISMA 2006 - Noise and Vibration Engineering. 18-20 Sept. 2006, Leuven,

COURSES DELIVERED

Graduate courses delivered (2005-2010, as teacher assistant)

Fondamenti della Misurazione (Measurement Fundamentals)

Post-graduate courses delivered (2005-2010 as TA, 2011-2012 as Lecturer)

*Mechanical and Thermal Measurements** (held in English)

Misure Meccaniche e Termiche (Mechanical and Thermal Measurements)

Misure e Diagnostica Industriale (Industrial Measurements and Diagnostics)

Post-graduate laboratory courses delivered (2005-2010 as TA, since 2011 as Lecturer)

Laboratorio di Misure Meccaniche e Termiche (Mechanical and Thermal Measurement Lab course)

Laboratorio di Misure Industriali (Industrial Measurements Lab course)

PhD training courses delivered (since 2009 as Lecturer)

*Managing and developing PC-based measurement systems (University of Padua – CISAS consortium)**

*Measuring with Labview**

* held in English