

## **ANDREA ALIVERTI - CURRICULUM VITAE**

Born in Como (Italy) on 14 March 1966

### **1. CURRENT POSITION**

Full Professor ('Professore ordinario a tempo pieno') - Dipartimento di Elettronica, Informazione e Bioingegneria (DEIB), Politecnico di Milano, Italy

Scientific disciplinary sector: ING-INF/06 - Electronic and informatics bioengineering

### **2. ACADEMIC EDUCATION AND TITLES**

1992 Master Degree (Laurea) in Electronic Engineering. Politecnico di Milano. Thesis title: "Acquisizione ed elaborazione di superfici nello spazio tridimensionale".

1997 PhD (Dottorato di Ricerca) in Biomedical Engineering. Politecnico di Milano. Thesis title: "Innovative methods and techniques to study respiratory mechanics".

1998 Assistant Professorship ('Ricercatore Univ.') - Dipartimento di Bioingegneria, Politecnico di Milano, Italy

2010 Associate Professorship - Dipartimento di Elettronica, Informazione e Bioingegneria, Politecnico di Milano, Italy

2014 National Scientific Qualification for the call sector 09/G2 Bioengineering, for the level I Professorship ('Professore I Fascia') (valid from 14/02/2014 to 14/02/2020)

2016 Full Professorship - Dipartimento di Elettronica, Informazione e Bioingegneria, Politecnico di Milano, Italy

### **3. RESEARCH FIELDS AND ACTIVITY, FUNDED PROJECTS AND TECHNOLOGY TRANSFER**

1992-2003 – Researcher at the "Centro di Bioingegneria" (Politecnico di Milano- Fond. Don Gnocchi IRCCS), where I contributed to create the Laboratory for Respiratory Analysis (Laboratorio di Analisi della Respirazione, LaRes), of which I was responsible from 1997

06-08/1994, 01-04/1996, 01-03/1999 - Research fellow at the Human Laboratory of the Meakins-Christie Laboratories, McGill University (Montreal, Canada), under the supervision of Prof. Peter T. Macklem

2003-today – Research activity performed at the Laboratorio di Tecnologie Biomediche (TBM Lab) of the Dipartimento di Elettronica, Informazione e Bioingegneria - Politecnico di Milano.

#### ***3.1 Research fields***

- bioengineering of the respiratory system
- physiological measurements
- biomedical instrumentation
- lung imaging
- functional evaluation
- respiratory mechanics

Specific research areas of interest:

- Development of innovative technology for the analysis of thoraco-abdominal kinematics and volumes during respiration. The research activity performed in this field led to the implementation of a set of original algorithms, models and techniques originally called “Opto-Electronic Plethysmography” (OEP).
- Development of integrative measurement methods and functional models, based on OEP, for studies in respiratory system physiology, applied physiology, pathophysiology and clinical research, such as:
  - a. respiratory mechanics at rest and during exercise;
  - b. effects of externally imposed expiratory flow limitation, normocapnic hyperpnea, volitional hyperpnea, fluid accumulation, inspiratory muscle training, hypobaric hypoxia (high altitude) on respiratory mechanics;
  - c. posture, cough, electrical stimulation, wind instrument playing;
  - d. respiratory mechanics in the following diseases: Chronic Obstructive Pulmonary Disease (COPD), pulmonary fibrosis, cystic fibrosis, obesity, Parkinson’s disease, Duchenne Muscular Dystrophy (DMD), Spinal Muscle Atrophy (SMA), muscular dystrophies, hemiplegia, congenital diaphragmatic hernia, osteogenesis imperfecta, glycogenosis, acute Lung Injury (ALI)/Adult respiratory Distress Syndrome (ARDS).
  - e. Effects of surgery, conventional and non-conventional mechanical ventilation, anesthesia, rehabilitation, pharmacological intervention, use of gas mixtures on respiratory mechanics.
- Development of Double Body Plethysmography (DBP), combining OEP and total body Plethysmography, which has allowed to measure blood shifts from the trunk to the extremities and to study cardiopulmonary interactions during different maneuvers and conditions, including exercise. In addition, starting from recent measurements performed by DBP, new approaches and techniques for Cardio-pulmonary resuscitation (CPR) have been envisaged.
- Multifactorial analysis of cardiopulmonary system, through the combination of OEP or DBP and respiratory system pressures, flow and EMG measurement. This analysis has allowed to define original models of the respiratory and cardiovascular systems, of respiratory muscles and rib cage mechanics.
- Physiological measurements, namely a) development of software and hardware systems particularly with regard to measurement problems of the respiratory system (volume, flow, pressure, gas concentration and motion) and cardiovascular system (arterial pressure, venous flow, cardiac output, peripheral blood flow); b) development of new methods of respiratory mechanics analysis based on the forced oscillation technique; c) development of acquisition systems for simultaneous acquisition of echographic images and respiratory signals; d) development of new methods for the measurements of oxygen consumption on a breath-by-breath basis; e) development of new systems for cough monitoring by sensor fusion techniques.
- Multimodal image analysis of respiratory system by a) development of new techniques and image processing methods based on multivolume registration for the functional analysis, namely for regional ventilation assessment, of healthy and emphysematous lung by Computed Tomography (CT) and for planning of lung volume reduction in COPD; b) Magnetic Resonance (MRI) without (proton) and with hyperpolarized Helium for quantifying regional ventilation; c) ultrasonography of the

diaphragm displacement, thickness and area of apposition; d) in-vivo microscopic imaging of alveolar and pulmonary vessels geometry.

- More recently, the research activity is considering other sectors, including a) development of new systems for screening and diagnosis of tumor tissues by Electrical Impedance Spectroscopy; b) development of new methods for monitoring of physiological variables (respiration, EKG, EMG, skin conductance, motion) by means of wearable unobtrusive sensors; c) development of new communication aids (refreshable braille display with electrical stimulation of the finger skin) for blind people. Being these activities in their early stage, they have not yet led published papers but only Master and PhD Theses or Patent Applications.

### **3.2 Funded Projects**

The research activities were mainly carried out within the following research programs:

#### a) EU funded Projects

b.1) BREATH (Biomed II, "Biomedical technology for Respiration Analysis Through optoelectronics") - Technical Coordinator of the consortium (1997-2000);

b.2) BREATH-PGC (Biomed II, "Biomedical technology for Respiration Analysis Through optoelectronics") - Technical Coordinator of the consortium (2001);

In the frame of this project, on April, 2001 I organized at Cernobbio (Como, Italy) the post-graduate course "What is new in mechanics of breathing: implications for diagnosis and treatment", that was attended by 120 european and extra-european researchers and led to the publication of a book that I co-edited and contributed with two chapters;

b.3) CARED (FP5, "Computer Aided Rehabilitation of Respiratory Diseases"- Technical Coordinator of the consortium (2001-2004);

b.4) PLANHAB (FP7, "Planetary Habitat Simulation) - Responsible of the activities of the Politecnico di Milano (2012-2015).

#### b) Italian Ministry of Research (Program MURST-CoFin)

"Respiratory mechanics: three dimensional analysis by optoelectronic systems"- Technical Coordinator of the entire project (1998-2000);

#### c) Italian Ministry of Health (Ricerche Finalizzate Min. Sanità/Min. Salute)

c.1) "Trattamento ventilatorio con CPAP nella sindrome delle apnee del sonno e nello scompenso cardiaca", 2002-2004, as PI of the Unit Centro di Bioingegneria Politecnico di Milano Fond. Don Gnocchi IRCCS (2001-2002);

c.2) "L'utilizzo di tecnologie innovative (tecnica della pletismografia optoelettronica) nella valutazione degli effetti della ventilazione non invasiva con modalità volumetrica e pressometrica sulla meccanica respiratoria in pazienti affetti da distrofia muscolare di Duchenne" (as PI of the Unit Politecnico di Milano) (2007-2009);

c.3) "From BioEngineering new tools for identification of early markers of respiratory and cardiac impairment in Duchenne Muscular Dystrophy" " (as PI of the Unit Politecnico di Milano) (2010-2012);

#### d) National Institute Health (NIH) Grant

Research Project 1 R01 HL090806-01A1 - "Evaluating Endoscopic Treatment of COPD by CT and 3He MRI" - Responsible of the activities of Subaward No. WU-09-357 PO No. 2909528A - (2008-2013)

e) Telethon Foundation, Italy

- e.1) "Study of respiratory mechanics in Duchenne's Muscular Dystrophy" (1990-91);
- e.2) "3D analysis of respiratory mechanics in DMD patients during intermittent positive pressure ventilation by nasal mask" (1992-93);
- e.3) "The analysis of breathing patterns in Duchenne Muscular Dystrophy patients : a new way for diagnosis and treatment of the respiratory failure" (1995);
- e.4) "The analysis of respiratory problems in Spinal Muscle Atrophy (SMA) patients: the diagnostic approach through kinematic studies as a method to define the best way of treatment by mechanical 3D analysis of respiratory mechanics in DMD patients during intermittent positive pressure ventilation by nasal mask" (1995-96) (*projects carried out as researcher at the Centro di Bioingegneria (Fond. Don Gnocchi-Politecnico di Milano) and collaborator of Valduce Hospital, Como and Costamasnaga (Italy) );*

f) Serpero Foundation, Italy

Research Project "Valutazione preoperatoria in chirurgia toracica con metodologia pletismografica optoelettronica: confronto con le tecniche tradizionali" funded by– Principal Investigator of the Unit Politecnico di Milano (2006-2008);

g) Cariplo Foundation, Italy

Research Project "REAL: REgionAl differences in Lung microvascular permeability: the hidden feature leading to pulmonary hypertension? A multi-scale study"- Responsible of the Unit Polimi (2013-2016);

h) Industrial research Projects

- h.1) GlaxoSmithkline, UK ("Study of the variability of airway impedance through opt-electronic plethysmography in asthmatic patients before and after pharmacological treatment") – Principal Investigator (2001-2002);
- h.2) BTS spa, Italy ("Validazione e test di un sistema pletismografico optoelettronico per applicazioni cliniche ") – Principal Investigator (2003-2005);
- h.3) Bronchus Technologies Inc., USA ("Imaging of Airway bypass by CT scan to Evaluate the Effectiveness of the Exhale® Drug-Eluting Stent in Homogeneous Emphysema Subjects with Severe Hyperinflation") – Principal Investigator (2006-2009);
- h.4) LIMA spa, Italy ("Navigazione intraoperatoria assistita al computer con ausilio di ultrasuoni" and "Sistemi di tracciabilità e rilevamento di dati clinici di artroprotesi");
- h.5) BTS spa, Italy ("Integrazione del sistema wireless EMG miniaturizzato con sistema di analisi della respirazione in ambito clinico") - Principal Investigator (2010);
- h.6) Italian Ministry of Research and University (art. 11 -D.M 8 agosto 2000 n. 593)  
Progetto 6/9 – "Sviluppo di un sistema per il monitoraggio domiciliare della funzione respiratoria in pazienti con patologie respiratorie croniche" (2009-2013)- Principal Investigator;
- h.7) Pulmonx Inc., USA ("Quantitative CT Analysis") - Principal Investigator(2016);

i) Other Projects

- i.1) Health Innovation Network Technology @ Lecco (Hint@Lecco) - Principal Investigator of the task "Analisi della Respirazione" (2004-2007);
- i.2) Polimi-IIT (Istituto Italiano di Tecnologia) - Researcher of the WP2 Rehabilitation - Human machine interface for recovery of lost functions (2006-2008)
- i.3) Forst (Fondazione per la Ricerca Scientifica Termale) - Principal Investigator of the project "Development of a wearable system for respiratory control and monitoring during thermal therapy " (2016-2018) (Principal Investigator);
- i.4) Vertex innovation award (2018-2019) – Principal investigator of the project “ASSESSMENT OF LUNG FUNCTION WITH MULTIVOLUME 1(H) MR IMAGING IN YOUNG CYSTIC FIBROSIS (CF) PATIENTS: COMPARISON WITH RADIOLOGICAL, FUNCTIONAL AND CLINICAL INDICATORS”

**3.3 Scientific Societies**

The European Respiratory Society (ERS) is the leading scientific, not-for-profit organization in its field in Europe. It is broad-based, with some 10,000 members and counting in over 100 countries. ERS is organized in 11 Assemblies, each of them organized in Scientific Groups.

Within ERS, I have been playing the following roles:

- 2009-2011 Secretary of the Group 4.03 - Respiratory Structure and Function
- 2011-2014 Chair of the Group 4.01- Clinical Physiology and Exercise
- 2014- Secretary of Assembly 4 - Clinical physiology, sleep and pulmonary circulation” (mandate 2014-2017)
- 2014- Member of the ERS Education Council (mandate 2014-2017)
- 2014- Member of the ERS International Congress Committee (mandate 2014-2017)
- 2017 Head of Assembly 4 - Clinical physiology, sleep and pulmonary circulation” (elected for mandate 2017-2020)

As officer, I contribute to the organization of the Annual ERS International Congress (a growing event now attracting more than 20,000 participants), where I chaired the following sessions:

- 'Various Issues in Respiratory Structure and Function' (Florence, 2000);
- 'Respiratory Mechanics in Health and Disease' (Berlin, 2001);
- 'Various Issues in Respiratory Structure and Function' (Wien, 2003);
- 'Respiratory Mechanics in Health and Disease' (Copenhagen, 2005);
- 'Assessment of respiratory pathophysiology' (Munich, 2006);
- 'Pulmonary mechanics and gas exchange' (Berlin, 2008);
- 'Acute lung injury and weaning' (Berlin, 2008);
- 'Respiratory and peripheral muscles: From basic mechanisms to altered function' (Barcelona, 2010);
- 'Respiratory muscles and breathing: assessment and training' (Barcelona, 2010);
- 'Respiratory and skeletal muscle assessment in health and disease' (Amsterdam, 2011);
- 'Innovative methods in clinical physiology' (Amsterdam, 2011);
- 'Functional respiratory imaging' (Wien, 2012);

- 'Modern clinical physiology: imaging structure and evaluating function' (Wien, 2012);
- 'Functional imaging of the lung, airways and diaphragm '(Barcelona, 2013);
- 'Clinical physiology and functional imaging in health and disease' (Barcelona, 2013);
- 'Functional Imaging' (Munich, 2014);
- 'The power of functional respiratory imaging for optimising therapy development and patient care' (Munich, 2014);
- 'Respiratory pathophysiology: mechanisms of alteration of lung, respiratory and peripheral muscle function' (2014);
- 'Functional and imaging techniques for assessing lung, airway and respiratory muscles' (2015)

On September 27-28, 2007 I organized and chaired the ERS Research Seminar: "The Limits to Exercise in COPD: New Insights from New Methods" (Como, Italy, 100 participants). The Seminar enabled the edition of a book that I co-edited and contributed with two chapters.

I am Currently acting as Chairman of the ERS Task Force 'Functional evaluation of lung and airways: building a flow-chart for a comprehensive, multifaceted, evidence-based use of the different techniques' (TF-2013-13). The aim of the Task Force, which is composed by 16 scientists from Europe and US, is to prepare an official final consensus statement, to be published on the European Respiratory Journal.

### **3.4 Collaborative research**

I am currently doing collaborative research with the following Universities:

McGill University, Montreal, Canada; Université de Geneve, Switzerland; University of Liverpool, United Kingdom; Saarland University, Homburg, Germany; University of Athens, Greece; Boston University, USA; University of Pennsylvania, Philadelphia, USA; University of Uppsala, Sweden; University of Cincinnati, USA; Universidade Federal de Pernambuco, Recife, Brazil; Universidade Federal de Rio Grande do Norte, Natal, Brazil. Universities of Milano, Genova, Firenze, Udine, Verona.

I have been visiting scientist (for at least 15 days) at the following Universities:

McGill University, Canada (1994, 1995, 1996, 1999, 2002, 2006, 2011); University of Pennsylvania, Philadelphia, USA (2006, 2007, 2008); Washington University in St Louis, USA (2004, 2007, 2008); University of Zurich, Switzerland (2006, 2007); University of Liverpool, United Kingdom (1999, 2000, 2001, 2002, 2005, 2006, 2007, 2008, 2010); University of Athens, Greece (2004, 2005, 2006, 2007, 2009, 2010, 2011); University of Uppsala, Sweden (2006, 2008, 2010, 2011, 2012); Universidade Federal de Pernambuco, Recife, Brazil (2011, 2012, 2013, 2014, 2015, 2016); Universidade Federal de Rio Grande do Norte, Natal, Brazil (2012, 2013, 2014, 2015, 2016, 2018).

### **3.5 Technology Transfer**

The research activity performed in the field of respiratory system bioengineering has always considered, when potential and appropriate, the transfer of methods and technology into industry and clinics.

Since 2006, Opto-Electronic Plethysmography (OEP) is commercialized by BTSBioengineering spa, that has the license to use three patents whose I am an inventor. Since then, OEP systems are used in several hospitals and research centers in Italy, Brazil, Canada, Germany, Greece, Poland, Slovenia, Sweden, Switzerland, United Kingdom, USA.

The research activities performed in the field of the mechanical properties of the respiratory system assessed by the Forced Oscillation Technique (FOT) and the patents introduced allowed to create on December 2008 a new spin-off company of the Politecnico di Milano, Resmon srl (now Restech srl), of which I was a founding partner. This company develops and commercialize innovative products and services for diagnosis, monitoring, telemonitoring and telecare. In this sector, two patents of which I am inventor are licensed to Philips Respironics (multinational company leader in the field) and Restech srl.

#### **4. TEACHING AND OTHER DIDACTIC ACTIVITIES**

##### **PhD Program in Bioengineering of the Politecnico di Milano**

From Oct 2014 (ongoing)	Coordinator and Chair of the Board of Professors of the PhD Program
Jan 2013 – Sep 2014	Vice-Coordinator of the PhD Program
From 2011	Member of the Board of Professors ('Collegio dei Docenti')
From 2016 (ongoing)	Professor of the Course ' <b>Ethics in Research</b> ', PhD School, Politecnico di Milano
From 2003	Professor of the Course ' <b>Biological measurements</b> ', PhD Program in Bioengineering, Politecnico di Milano

Academic Year	
From 2014-15 (ongoing)	Professor of the Course ' <b>Technologies for sensors and clinical instrumentation</b> ' (10 CFU/ECTS) - Laurea Magistrale (MSc) Program in Biomedical Engineering, Politecnico di Milano;
From 2011-12 to 2013-14	Professor of the Course " <b>Tecnologie per Sensori e Strumentazione Clinica</b> " (10 CFU/ECTS) - Laurea Magistrale (MSc) Program in Biomedical Engineering, Politecnico di Milano;
From 2008-09 to 2010-11	Professor of the Course " <b>Tecnologie per Sensori</b> " (5 CFU/ECTS) - Laurea (BSc) and Laurea Magistrale (MSc) Programmes in Biomedical Engineering, Politecnico di Milano;
From 2003-04 to 2007-08	Professor of the Course " <b>Tecnologie per Sensori e Strumentazione</b> " (5 CFU/ECTS) - Laurea (BSc) and Laurea Magistrale (MSc) Programmes in Biomedical Engineering, Politecnico di Milano;
From 2014-15 (ongoing)	Professor of the Course ' <b>Bioengineering of the Respiratory System</b> ' (5 CFU/ECTS) - Laurea Magistrale (MSc) Program in Biomedical Engineering, Politecnico di Milano;
From 2012-13	Professor of the Course ' <b>Bioingegneria del Sistema</b>

to 2013-14	<b>Respiratorio'</b> (5 CFU/ECTS) - Laurea Magistrale (MSc) Program in Biomedical Engineering, Politecnico di Milano;
From 2003-04 to 2011-12	Professor of the Course ' <b>Bioingegneria dei Sistemi di Controllo Autonomo e Respiratorio'</b> (C.I.) (2.5 CFU/ECTS) - Laurea Magistrale (MSc) Program in Biomedical Engineering, Politecnico di Milano;

From 1997 to 2002	Professor of the Course ' <b>Bioengineering of Physiological Systems and rehabilitation'</b> – Undergraduate Program (Diploma Universitario) in Biomedical Engineering, Politecnico di Milano
From 2012 to 2014	Visiting professor at the Universidade Federal do Rio Grande do Norte, Natal Brazil (visiting professorship funded by Conselho Nacional de Desenvolvimento Científico e Tecnológico CNPq/ Brasil, National Research Council of Brazil)

### ***Theses supervision***

Since 1993, I acted as

- Scientific Advisor ('Relatore') of 10 **PhD theses** in Bioengineering at the Politecnico di Milano, Italy PhD Theses ('Dottorato di Ricerca') of the following **PhD candidates**: Patrino, Quaranta, Salito, Laviola, Uva, Pennati, Priori, Mazzuca, Garavaglia, Meroni. **Four** theses are currently ongoing (Cesareo, Feletti, Wen Qi, Colombo)
- Supervisor ('Relatore') or co-supervisor ('Correlatore') of **84 Master (MSc) Theses** ('Laurea (V.O.)', 'Laurea Specialistica' or 'Laurea magistrale') in Biomedical Engineering or Electronic Engineering at the Politecnico di Milano (Faculty of Engineering) of **100students**.
- Supervisor ('Relatore') of **51 Bachelor (BSc) Theses** ('Diploma Universitario', 'Laurea Triennale' or 'Laurea') in Biomedical Engineering at the Politecnico di Milano (Faculty of Engineering) of **77 students**
- a MSc thesis at the University of Twente, Netherlands (R. Wust) and a PhD thesis at the Campinas University, Sao Paolo, Brazil (K. Sarro);

### **5. INVITED LECTURES AND SEMINARS**

#### ***(Selected lectures, over the last years)***

- 11/2016 Bruxelles (Belgium) – Université Libre de Bruxelles, Faculty of Medicine, Laboratory of Anatomy, Biomechanics and Organogenesis - Invited lecture: "Physiologie du thorax et la biomécanique respiratoire"
- 10/2016 Rotterdam (Netherlands) – Erasmus MC: University Medical Center Rotterdam - Invited lecture: "Innovative methods for respiratory functional evaluation"
- 09/2015 Edinburgh (UK) – 7th International Workshop for Pulmonary Functional Imaging (IWPMFI) - Invited lecture: "CT methods to visualize ventilation"
- 09/2015 Amsterdam (Netherlands) – ERS International Congress



- Invited lecture: "Measurements of Respiratory mechanics"
- 05/2014 Genova (Italy) –Congresso nazionale SIRN (Italian Society of Neurological rehabilitation)  
Invited lecture: "Valutazione della funzione ventilatoria nelle patologie neuromuscolari"
  - 10/2013 Bordeaux (France) – International Workshop "Lung - from molecule to image" –  $\pi$ -net  
Invited lecture: "CT-based functional imaging for assessment of regional ventilation in health and emphysema" at the
  - 09/2013 Barcelona (Spain) – International Annual ERS Congress  
Invited lecture: "Respiratory and movement biomechanics: laboratory assessment" at the PGC Course "New technology assessment in COPD"
  - 09/2012 Universiteit Antwerp (Belgium)  
Invited lecture: "Functional respiratory CT imaging: new perspectives"
  - 09/2012 Vienna (Austria) – International Annual ERS Congress  
"Meet the professor" Seminar: "Functional respiratory imaging"
  - 09/2012 Ghent (Belgium) – International Congress ESOT (European Society for Organ Transplantation)  
Invited lecture: "The Abdominal Circulatory Pump"
  - 05/2011 Harvard Medical School/ Brigham and Women's Hospital, Boston (USA)  
Invited Lecture: "The 'abdominal circulatory pump': a new tool for CPR?"
  - 05/2011 McGill University, Montreal Canada  
Invited lecture: "Innovative methods for respiratory mechanics analysis".
  - 09/2010 Baltimore (USA) - Flow-volume (FVUW) meeting  
Invited lecture: "The abdominal circulatory pump"
  - 10/2008 University of British Columbia, Vancouver (Canada)  
Invited lecture: "Analysis of CT images in emphysema"
  - 10/2008 Banff (Canada) Annual congress of the Canadian Society of Exercise Physiology  
Invited lecture: "Effect of expiratory flow limitation on chest wall mechanics during exercise"
  - 05/2008 Robarts Institute London University, Ontario (Canada)  
Invited Lecture: "CT imaging for airway by-pass"
  - 09/2005 Copenhagen (Denmark) ERS Annual Congress  
Invited lecture: "Mechanical factors limiting physical exercise in disease" in the Symposium "Mechanisms limiting exercise in COPD: new insights"
  - 06/2005 Zurich (Switzerland), ETH and University of Zurich-Institute of Physiology  
Invited lecture: "Expiratory flow limitation during exercise: from physiological models to COPD patients through new technology"
  - 04/2005 - Chiba (Japan)  
Invited lecture as selected young investigator of the European Respiratory Society (ERS) to the 45th Annual Meeting of the Japanese Respiratory Society (JRS): "The effects of expiratory flow limitation (EFL) on chest wall mechanics during exercise: new insights from opto-electronic plethysmography (OEP)"

## **6. HONOURS AND AWARDS**

2016 - Cited among the Top Italian Scientists (TIS), Via Academy

([http://www.topitalianscientists.org/top\\_italian\\_scientists.aspx](http://www.topitalianscientists.org/top_italian_scientists.aspx))

- 2007 - Third prize “Start Cup Milano-Lombardia” (Italian National Prize for Innovation)
- 2005 - “Selected young investigator” of the European Respiratory Society (ERS) at the 45th Annual Meeting of the Japanese Respiratory Society (JRS), Chiba (Japan)
- 2004 - Winner of the 2nd prize (20,000 €) of the “ERS (European Respiratory Society) - COPD Award 2004”
- 1998 - Winner of the Prize Paolo Durst, Microtec, from the Interdisciplinary Centre of Bioengineering, Università di Padova, for the best Italian PhD thesis in Biomedical Engineering .

## **7. EDITORIAL ACTIVITIES**

Member of the Editorial Board of the following journals:

- Journal of Applied Physiology
- Respiratory Physiology and Neurobiology;
- Breathe
- Advances in Therapy (*advisory board member*)
- Current Respiratory Medicine Reviews;
- ISRN Pulmonology;
- Physiology Journal;
- Journal of Respiratory and CardioVascular Physical Therapy

In addition to the journals where I am an Editorial Board member, I regularly act as reviewer for the following scientific journals: Journal of Applied Physiology, European Respiratory Journal, Thorax, Chest, European Journal of Applied Physiology, IEEE Transaction of Signal Processing, IEEE Transaction of Biomedical Engineering, Respiratory Medicine, Journal of Applied Biomechanics, Annals of Biomedical Engineering, Clinical Science, Plos One.

## **8. BIBLIOMETRIC INDEXES**

***(Updated to 20 June 2018)***

- Google scholar (<http://scholar.google.it/citations?user=OZJAg2oAAAAJ&hl=it&oi=ao>)  
h-index: 36; Total citations: 4993; i10-index: 89
- Scopus SciVerse (Author=(aliverti); Initials=A; Affiliation= pol\* mil\*)  
h-index: 30; Results found: 177; Total citations: 3066
- ISI Web of Science (Author=(aliverti a\*) AND Address=(pol\* SAME mil\*);  
h-index: 27; Results found: 214; Sum of the Times Cited: 2663

## **9. LIST of PUBLICATIONS**

***(listed in each section from most recent to oldest)***

### **9.1 FULL PAPERS (peer-reviewed, on ISI, PubMed and Scopus indexed journals)**

1. LoMauro A, Aliverti A. Blood Shift During Cough: Negligible or Significant? Front Physiol. 2018 May 28;9:501.
2. LoMauro A, Aliverti A. Sex differences in respiratory function. Breathe (Sheff). 2018 Jun;14(2):131-140.
3. Cesareo A, LoMauro A, Santi M, Biffi E, D'Angelo MG, Aliverti A Acute Effects

- of Mechanical Insufflation-Exsufflation on the Breathing Pattern in Stable Subjects With Duchenne Muscular Dystrophy. *Respir Care*. 2018 [Epub ahead of print]
4. Sarmiento A, **Aliverti A**, Marques L, Pennati F, Dourado-Júnior ME, Fregonezi G, Resqueti V. Multiparametric Analysis of Sniff Nasal Inspiratory Pressure Test in Middle Stage Amyotrophic Lateral Sclerosis. *Front Neurol*. 2018 May 2;9:306.
  5. LoMauro A, Frascini P, Pochintesta S, Romei M, D'Angelo MG, **Aliverti A**. Ribcage deformity and the altered breathing pattern in children with osteogenesis imperfecta. *Pediatr Pulmonol*. 2018 [Epub ahead of print]
  6. Feletti F, Mucci V, **Aliverti A**. Chest Ultrasonography in Modern Day Extreme Settings: From Military Setting and Natural Disasters to Space Flights and Extreme Sports. *Can Respir J*. 2018 Mar 15; 2018: 8739704.
  7. Rattes C, Campos SL, Morais C, Gonçalves T, Sayão LB, Galindo-Filho VC, Parreira V, **Aliverti A**, Dornelas de Andrade A. Respiratory muscles stretching acutely increases expansion in hemiparetic chest wall. *Respir Physiol Neurobiol*. 2018 Aug;254:16-22. doi: 10.1016/j.resp.2018.03.015.
  8. Pennati F, Roach DJ, Clancy JP, Brody AS, Fleck RJ, **Aliverti A**, Woods JC. Assessment of pulmonary structure-function relationships in young children and adolescents with cystic fibrosis by multivolume proton-MRI and CT. *J Magn Reson Imaging*. 2018 Feb 19. doi: 10.1002/jmri.25978. [Epub ahead of print]
  9. LoMauro A, Romei M, Gandossini S, Pascuzzo R, Vantini S, D'Angelo MG, **Aliverti A**. Evolution of respiratory function in Duchenne muscular dystrophy from childhood to adulthood. *Eur Respir J*. 2018 Feb 7;51(2).
  10. Feitosa LAS, de Britto MCA, **Aliverti A**, Noronha JB, de Andrade AD. Accuracy of optoelectronic plethysmography in childhood exercise-induced asthma. *J Asthma*. 2018 Jan 23:1-8. doi: 10.1080/02770903.2018.1424196. [Epub ahead of print]
  11. Kostic P, LoMauro A, Larsson A, Hedenstierna G, Frykholm P, **Aliverti A**. Specific anesthesia-induced lung volume changes from induction to emergence: a pilot study. *Acta Anaesthesiol Scand*. 2018 Mar;62(3):282-292.
  12. Dias OM, Baldi BG, Pennati F, **Aliverti A**, Chate RC, Sawamura MVY, Carvalho CRR, Albuquerque ALP. Computed tomography in hypersensitivity pneumonitis: main findings, differential diagnosis and pitfalls. *Expert Rev Respir Med*. 2018 Jan;12(1):5-13.
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