europass Curriculum vitae

PERSONAL INFORMATION

Francesco Balduzzi

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Sex Male | Date of birth 12/05/1985 | Nationality Italian

POSITION

Research Fellow c/o Dept. of Industrial Engineering (University of Florence)

WORK EXPERIENCE

01/01/2013–Present

Research fellow

Department of Industrial Engineering, Università degli Studi di Firenze
Via di Santa Marta, 3, 50139 Florence (Italy)
http://www.dief.unifi.it

Business or sector Professional, scientific and technical activities

01/01/2010–Present

Mechanical Engineer - External collaborator

Laboratorio LINEA (Laboratorio d'Innovazione per l'Energia e l'Ambiente) - PIN Via Filicaia 24, 59100 Prato (Italy), Prato (Italy)

Business or sector Applied research

01/05/2018–Present

Researcher

ICAD (Internation Consortium for Advanced Design)
Via di Santa Marta 3, 50139 Florence (Italy)

01/11/2011–28/02/2012

Higher education teaching professional

Securgreen Course (high-education project supported by the Tuscany Region), Prato (Italy)

EDUCATION AND TRAINING

01/01/2010–31/12/2012

PhD, Industrial and Reliability Engineering

University of Florence, Florence (Italy)

CFD analysis on energy systems:
- Internal combustion engines
- Reciprocating compressors
- Micro-Wind turbines
- Atmospheric boundary layer

Design and optimization of internal combustion engines

PhD Thesis titled:
Development of a CFD approach for the performance prediction of reciprocating compressors

01/10/2007–24/09/2009

Master of Science, Mechanical Engineering (110/110 with honors)

University of Florence, Florence (Italy)

Energetics (Internal Combustion Engines, Turbomachinery, Energy Systems, Heat Transfer, Fluid-Dynamics, Electric Machinery)

Mechanical Design (Engine Design, Vehicle Design, Vehicle Dynamics, Computer Aided Design, Finite Element Modeling)

Automatics (Fundaments of Automatics, Mecatronics, Fundaments of Robotics)

Thesis titled:
3D Thermo-Fluid Dynamic Simulation of a 4 Stroke Indirect Injection Diesel Engine

01/10/2004–19/09/2007

Bachelor's degree, Mechanical Engineering (110/110 with honors)

University of Florence, Florence (Italy)

Thesis titled:
1-D simulation of 4-strokes internal combustion engines for off-road application

09/1999–07/2004

High School/Secondary Diploma (100/100)

Liceo Scientifico Piero Gobetti, Bagno a Ripoli (FI) (Italy)

PERSONAL SKILLS

Mother tongue(s) Italian

Foreign language(s)

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C1	C2	C1	C1	C1
French	B1	B2	A2	B1	B1
Russian	A1	A1	A1	A1	A1

Levels: A1 and A2: Basic user - B1 and B2: Independent user - C1 and C2: Proficient user
Common European Framework of Reference for Languages

Communication skills

Good skills in team building, gained through the participation in three team projects during the academic studies, as well as two internships for the final project at the university in partnership with external companies.

Good ability to adapt to multicultural environments, acquired through both having grown up in a multiethnic religious community and a passion for traveling all around the world.

Organisational / managerial skills

Good experience in project or team management, acquired during the three years of PhD studies, thanks to several partnerships with external companies (GE Oil & Gas, EDI Progetti, Betamotor) and to the supervision of interships of academic students.

Organisation of small groups for the support to the studies (turoring in maths and physics).

Job-related skills

Responsible of all of the activity involving CFD simulations on fluid machines and energy systems of the REASE (Reciprocating Engines and Advanced Systems for Energy) group of the Dept. of Industrial Engineering of the University of Florence:

- Steady and transient CFD simulation of reciprocating compressor for the prediction of the working cycle
- Conjugated Heat Transfer (CHT) simulations for the analysis of compressor's refrigerating systems
- CFD simulation of the scavenging process of 2-Stroke engines
- Unsteady CFD simulation of Low Pressure Direct Injection systems (LPDI) and High Pressure Direct Injection systems (HPDI) for 2-Stroke engines
- Advanced CFD simulation of the combustion process of internal combustion engines
- CFD analysis of turbocharger's volute

- Development and validation of 2D and 3D CFD models for the simulation of vertical axis wind turbines and horizontal axis wind turbines
- Development and validation of simplified CFD models for the simulation of wakes generated by vertical axis wind turbines and horizontal axis wind turbines
- Atmospheric boundary layer analysis and turbines' siting

Digital skills

SELF-ASSESSMENT				
Information processing	Communication	Content creation	Safety	Problem solving
Proficient user	Proficient user	Proficient user	Independent user	Independent user

Digital skills - Self-assessment grid

Software knowledge (skills acquired through academic studies):

- ANSYS Fluent and CFX - 3D CFD simulation code
- Ricardo VECTIS - 3D CFD simulation code for internal combustion engines
- Ricardo WAVE - 1D CFD simulation code for internal combustion engines
- OpenFOAM - General purpose CFD open source code
- Altair Hyperworks - Finite Elements Modeling code
- Solid Works and Siemens NX - CAD software
- C++, Matlab, Python - Programming codes
- Windows environment and Microsoft Office tools
- Linux and Mac OS operating systems

ADDITIONAL INFORMATION

Honours and awards

Winner of the research grant funded by "Fondazione Cassa di Risparmio di Firenze" for the subject "Energy, environment and sustainability", year 2016-2017

- Project title: *Development of a novel approach for the siting of mini-micro wind turbines*

Winner of the funded project from "Fondazione Cassa di Risparmio di Firenze", year 2017

- Project title: *High-computing resources applied to novel approaches for the siting of mini-micro wind turbines*

Honours and awards

06/2018
Best paper award - Wind Energy Committee of the ASME Turbo Expo conference for paper: "*Comparative analysis of different numerical techniques to analyze the wake of a wind turbine*"

06/2017
Best paper award - Wind Energy Committee of the ASME Turbo Expo conference for paper: "*Effects of airfoil's polar data in the stall region on the estimation of Darrieus wind turbines performance*"

06/2016
Best paper award - Wind Energy Committee of the ASME Turbo Expo conference for papers: "An Experimental and Numerical Assessment of Airfoil Polars for Use in Darrieus Wind Turbines. Part 1 - Flow Curvature Effects" and "An Experimental and Numerical Assessment of Airfoil Polars for Use in Darrieus Wind Turbines. Part 2 - Post-Stall Data Extrapolation Methods"

Citations

ASN 2018 (Abilitazione Scientifica Nazionale), sector 09/C1 for Associate Professor, valid since 26/07/208

Teaching activity

01/2010 - now
Didactic support to the teaching course of “Internal Combustion Engine” (MSc in Mechanical Engineering)

01/2015 - now
Didactic support to the teaching course of “Operating machines” (MSc in Mechanical Engineering)

01/2010 - 01/2015
Didactic support to the teaching courses of “Industrial Energy Management” and “Power Plants and Cogeneration”

01/2010 - now
Supervisor of more than 15 MSc theses and scientific co-supervisor of 2 PhD theses