Curriculum Vitae

Personal information

Name	GIACOMO FERRARESE
Citizenship	Italian
Date of birth	06/12/1985
Contacts	giacomo.ferrarese@gmail.com
	+39 ~~0000000000~~

Experience

Date	From November 2018 to March 2021
Position	Research assistant at Politecnico di Milano.
Research project title	"Analysis and Management of Hydraulic Devices"
Research topics and acquired skills	The research is focused on the identification of the possible improvement of water distribution systems and in general of hydraulic plants, achievable with the use of the GreenValve system. The development of the device is one of the goals of the research. Technological solutions and performance forecasting have a central role in the research. During this part of the experience I was involved in the Regional Grant "Smart-Living" with the project "Smart Water" the focus of the project is on the use of fast prototyping for the production of GreenValve prototypes and the calculation of energy potential in some application cases.

Date	From November 2015 to November 2019
Position	Phd candidate at Politecnico di Milano.
Research project title	"A control valve for energy harvesting"
Research topics and acquired skills	The aim of the research is the definition of technologies and procedure to save energy and improve management quality of water systems. The research activity of the first year has been focused on the selection of several application cases of interest for the application of energy recovery devices and the development of the GreenValve system. Numerical (through CFD software) and experimental analysis of the GreenValve has been made with the scope of device optimization.

Date	2012 - 2015
Position	Research assistant at Politecnico di Milano.
Research project title	"Fluid dynamic modeling of flow through hydraulic devices"
Research topics and acquired skills	The work regarded the fluid dynamic modeling and the experimental investigations of several flow control devices. Such as control valves and fittings. Some process of optimization of the internal parts of the devices has been developed through both numerical and experimental tools. During this period some innovative devices to recover energy from the flow has been investigated experimentally and numerically. Especially an innovative device patented by the politecnico di Milano has been tested in the hydraulic laboratory. An experimental set-up to test micro Hydraulic turnbines

has been designed implemented and used in the Control valve section of the Hydraulic engineering laboratory of the Politecnico di Milano.

Workshop to the students about the laboratory activities explaining the functioning of the instrumentations used and the functioning of the test plants has been conducted.

Technical skills	**Use of Phoenics (CFD), Ansys Fluent (CFD), Matlab.**
	Laboratory measurements (pressure, discharge, energy, temperature, torque and force), data acquisition and elaboration, Labview programming. Test plant for valve design, pumps and line valves sizing.
	Safety base course at hydraulic laboratory.

Date	2011 - 2012
Position	Research assistant at Politecnico di Milano.
Research project title	**" Scripting to optimize fluid dynamic calculation with Phonics"**
Research topics and acquired skills	The research was focused on the development of script code to improve the performances and reliability of the software PHONICS regarding:
	-mesh
	-convergence
	-parallelization
	The responsibilities regarded the implementation and the maintenance of the relationship with the HPC (High Performance Computing) center CILEA (now CINECA) as referent of the research group. The software has been installed on the clusters and the script to use it defined.
Technical skills	Parallel computing with Phoenics, HPC services , use of STAR CCM+

Collaborations	
With Politecnico di Milano	
Date	20/04/2012 -19/05/2012
Title	"Experimental and numerical modeling of hydraulic devices"
Topic	The work was aimed at the modeling and analysis of CFD native and experimental datasets aimed at the creation of predictive performance models for some particular hydraulic devices.
Date	18/12/17 – 17/01/2018
Title	"Fluid dynamic analysis of the GreenValve device in specific operative hydraulic conditions"
Topic	3D modeling of a 2 inches prototype of GreenValve and CFD prediction of the performances.
Date	15/09/21 – 14/10/21
Title	"Development of an algorithm and of a procedure with Matlab software to apply a series of energy recovery devices in irrigation networks"
Topic	An irrigation network has been considered as case study to evaluate the pros of smart sensors and remote operation devices installation.

Education

Date	2015-2019
Title	Philosophy Doctor
PhD thesis title	"Flow Management and Energy Harvesting with the GreenValve System"
University	Politecnico di Milano

Date	2008 – 2010
Title	Master of science in Civil Engineering
MSc thesis title	"Fluid dynamic modeling and efficiency study of suction devices". Tutor: prof. Stefano Malavasi
University	Politecnico di Milano
Mark	102/110

Date	2006 – 2008
Title	Bachelor of science in Civil Engineering
BSc thesis title	"L'interazione tra acciaio e calcestruzzo". Tutor: prof. Vincenzo Valente
University	Politecnico di Milano

Publications

International Journals

G.V. Messa, G. Ferrarese, S. Malavasi, A mixed Euler-Euler/Euler-Lagrange approach to erosion prediction, Wear. 342–343 (2015). https://doi.org/10.1016/j.wear.2015.08.015.

G. Ferrarese, G.V. Messa, M.M.A. Rossi, S. Malavasi, New method for predicting the incipient cavitation index by means of single-phase computational fluid dynamics model, Adv. Mech. Eng. 7 (2015). https://doi.org/10.1177/1687814015575974.

S. Malavasi, M.M.A. Rossi, G. Ferrarese, GreenValve: hydrodynamics and applications of the control valve for energy harvesting, Urban Water J. 15 (2016). https://doi.org/10.1080/1573062X.2016.1175483.

P. Boffi, G. Ferrarese, M. Ferrario, S. Malavasi, M.V. Mastronardi, M. Mattarei, Coherent optical fiber interferometric sensor for incipient cavitation index detection, Flow Meas. Instrum. 66 (2019) 37–43. https://doi.org/10.1016/j.flowmeasinst.2018.11.005.

G. Ferrarese, S. Malavasi, Perspectives of water distribution networks with the GreenValveSystem, Water. (2020). https://doi.org/10.3390/w12061579.

G. Ferrarese, A. Pagano, U. Fratino, S. Malavasi, Improving Operation of Pressurized Irrigation Systems by an Off-grid Control Devices Network, Water Resour. Manag. (2021). https://doi.org/10.1007/s11269-021-02869-5..

D.M. la Rosa, M.M.A. Rossi, G. Ferrarese, S. Malavasi, On the pressure losses through multistage perforated plates, J. Fluids Eng. Trans. ASME. 143 (2021) 1–9. https://doi.org/10.1115/1.4049937.

G. Ferrarese, S. Benzi, M.M.A. Rossi , S. Malavasi, Experimental characterization of a self-powered control system for a real-time management of water distribution networks, Urban Water Journal (2021), accepted for publication

Contributions	Giacomo Ferrarese, Stefano Malavasi "Energy Harvesting in Hydraulic Systems" Contribution to the collection "Energy Harvesting: Technologies, methods and applications", Nova Publishing, 2015.
Conferences	Marco MA Rossi, Giacomo Ferrarese, Gianandrea Vittorio Messa, Stefano Malavasi "Improvements and validation of the numerical prediction of the incipient cavitation index", ASME 2015 Pressure Vessels and Piping Conference.

Stefano Malavasi, Marco M. A. Rossi, Gianandrea V. Mess, Giacomo Ferrarese, "Numerical Method to Provide Cavitation Index for Control Valves", DOI: 10.1115/PVP2013-97150, PVP2013-97150, pp. V004T04A003; 7 pages, ASME 2013 Pressure Vessels and Piping Conference, 2013

Stefano Malavasi, Gianandrea Vittorio Messa, Giacomo Ferrarese, "Solid-Liquid Flow Through a Wellhead Choke Valve", DOI: 10.1115/PVP2013-97737, PVP2013-97737, pp. V004T04A008; 10 pages, ASME 2013 Pressure Vessels and Piping Conference, 2013

S. Malavasi, G. Ferrarese, M.M.A. Rossi, "A Control Valve for Energy Harvesting", DOI: 10.1016/j.proeng.2014.11.482, Volume 89, 2014, Pages 588–594, English, Procedia Engineering, Intenational 16th Water Distribution System Analysis Conference, WDSA2014 — Urban Water Hydroinformatics and Strategic Planning 2014.

Malavasi S., Ferrarese G., Rossi M.M.A. (2014) "Experimental and numerical characterization of the control valve for energy harvesting", International Water Ideas 2014 Conference. Bologna, Italy, 2014.

Ferrarese G., Malavasi S., Rossi M.M.A., (2016) "Energy harvesting for stand alone applications", Idra 2016, Bologna, Italy

Bragalli C., Ferrarese G., Malavasi S., (2018) "prospettive di sfruttamento del potenziale energetico di una rete di distribuzioneidra", Idra 2018, Ancona.

Ferrarese G., Malavasi S., "Energy recovery from flow control processes: the GreenValve concept", 2017, YIC, Milano

Ferrarese G., Malavasi S., Castellini L., "Recover energy for smart grid", International Conference on Energy Engineering and Smart Grids, 2018, Cambridge, UK

Ferrarese G., Malavasi S., Can a smart control valve evaluate flow rate?, IDRA 2020 14-16 Giugno 2021

Seminars	Ferrarese G, Pagano A, Malavasi S., Fratino U., "New management perspectives in pressurized on-demand irrigation systems using innovative smart control valves", EGU General Assembly 19–30 April 2021.

Ferrarese G, Fratino U., Malavasi S., Pagano A, "A smart control valve for improved irrigation network management", Granada, Spain,19-24 June 2022. Accepted for presentation

Malavasi S., Ferrarese G., "GreenValve: recupero di energia per un acquedotto intelligente", VIII seminario Tecnologie e Strumenti Innovativi per le Infrastrutture Idrauliche "TeSI" Napoli, 8-9 Luglio 2019

Malavasi S., Ferrarese G., "Energy and control in water systems", 2021, 2 Febbraio 2021, Università degli studi della Basilicata. |
| Thesis/stage supervisor | I've been correlator of Thesis works and supervisors of stages:
2013
"Analisi teorica e sperimentale di una valvola di regolazione per il recupero di energia" (Cecilia Paris)
2014
"Analisi Sperimentale di una Pico-Turbina Idroelettrica" (by Andrea Pisati)
2015
"Analisi sperimentale di dispositivi di regolazione per flussi criogenici" (Roberta Caviggia)
2016
"Numerical approach to energy recovery devices in pipelines" (Olivier Baccino)
"Sistema di monitoraggio in bra ottica per la misura della cavitazione in impianti idraulici (Fabio Bellani)
2017
"Energy Recovery from Water System" (Castellini)
"Le turbine fluviali, prospettive ed applicazioni. La valutazione del potenziale energetico in lombardia" (Gabriele d'Alessio)
"Ottimizzazione energetica di reti in pressione e caratterizzazione sperimentale di un dispositivo per il recupero di energia: greenvalve" (Fabio Monza, Carlo Speranza)
"numerical analysis of the globe greenvalve" (Matteo Sacchi)
2018
"Caratterizzazione sperimentale e confront di prototipi della greenvalve" (Dadda, Gnocchi)
"Caratterizzazione sperimentale della greenvalve: coefficiente di flusso e indice di cavitazione" (Antonio Morelli)
2019
"Gestione automatica delle pressioni con il sistema greenvalve" (Armando Rizzuti)
"Analisi sperimentale di prototipi green valve system" (Stefano Benzi) |
| Teaching/supervising | A.A. 2020-2021
-Teaching assistant at course Fluid Labs (Docente: Messa Gianandrea). |

A.A. 2019-2020
-Teaching assistant at course Fluid Labs (Docente: Ballio Francesco).

A.A. 2018-2019
-Teaching assistant at course Fluid Labs (Docente: Malavasi).
-Teaching assistant at course Meccanica dei Fluidi (Docente: Messa).

A.A. 2017-2018
-Teaching assistant at course Fluid Labs (Docente: Malavasi).
-Teaching assistant at course Meccanica dei Fluidi (Docente: Messa).
- Supervising for laboratory visit with the students of the course Impianti speciali idraulici about data acquisition and valve performance tests.

A.A. 2016-2017
- Teaching assistant at course Fluid Labs (Docente: Malavasi).
- Teaching assistant at course Meccanica dei Fluidi (Docente: Messa).

A.A. 2015-2016
- Teaching assistant at course Fluid Labs (Docente: Malavasi).
- Teaching assistant at course Meccanica dei Fluidi (Docente: Messa).
- Tutoring for Fluid Labs course.
- Lab supervising to impianti idraulici speciali and Idraulica courses

A.A. 2014-2015
- Supervising for laboratory visit with the students of the course Fluid Labs about data acquisition and valve performance tests.
- Supervising for laboratory visit with the students of the course Impianti speciali idraulici about data acquisition and valve performance tests.

Languages	Mother tongue: Italian English. TOEFL, 02/06/2007, internet based mark:92.
Social skills and competences	My work experience in a research group let me realize the importance of establishing the objective to develop successfully a research activity. Another outcome of my work experience is the awareness that communication between the components of a working team is essential in reducing the time to target and the resources needed. During my work experience I did several workshop to the students on the laboratory activities explaining the functioning of the instrumentation used and the functioning of the test plants. Passioned about sport, I' ve been a sailing instructor since several years. This experience helped me understanding the importance of cooperation in a crew and the effectiveness of planning in achieving the objective. I've been also skipper for some events and I realized that the assignment of the roles to the crew component is the key element to achieve some good results.