

Massimo Rundo

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EDUCATION

- July 1996: M.Sc. in Mechanical Engineering, Politecnico di Torino.

ACADEMIC POSITIONS at Politecnico di Torino

- September 1996 - May 2001: Contract Researcher.
- June 2001 - December 2004: Research Assistant (Assegnista di ricerca).
- January 2005 - December 2019: Assistant Professor (09/C1).
- December 2019 - present: Associate Professor (09/C1).

INSTITUTIONAL ACTIVITIES

- Since 2013, coordinator of the Fluid Power Research Laboratory at the Energy Department.
- Since 2013: member of the Board of the PhD Program in Energetics.
- Member of the Scientific Committee of the 2nd level Specializing Master “*Metodologie progettuali e di processo per l'industrializzazione di macchine telescopiche modulari*”, first edition 2018-2020, second edition 2020-2022.
- Supervisor of about 65 B.Sc. theses, 40 M.Sc. theses and 1 PhD thesis.
- External reviewer of 9 PhD theses.

RESEARCH FIELD

Modelling, simulation and testing of fluid power components and systems.

RESEARCH ACTIVITIES at Politecnico di Torino

- mathematical and simulation models of positive displacement pumps (gerotor, external gear, crescent, vane, piston),
- study of performances of positive displacement pumps at high rotational speed,
- hydraulic and electro-hydraulic devices for the displacement variation of automotive vane pumps,
- experimental evaluation of the energy absorbed by lubricating pumps during a driving cycle,
- variable displacement vane pump dynamics by means of cosimulation,
- simulation of automotive and aeronautic fluid power systems: lubricating circuit for ICE and helicopter transmissions, hydraulic clutch actuator, vacuum pump for brake booster,
- simulation of the working hydraulics of mobile machines (excavators and telehandlers),
- analysis of flow forces in pressure control and directional control valves.

TEACHING at Politecnico di Torino as Lecturer of M.Sc and B.Sc courses

- From A.Y. 2012/2013, *Fluid Power 1*, M.Sc. in Mechanical Eng., in English.
- From A.Y. 2010/2011, *Automotive fluid power systems*, M.Sc. in Automotive Eng., in English.
- In A.Y. 2012/2013, *Fluid Power 2*, M.Sc. in Mechanical Eng., in English.
- In A.Y. 2011/2012, *Oleodinamica*, B.Sc. in Mechanical Eng.
- In A.Y. 2008/2009, 2009/2010, *Sistemi oleodinamici per l'autoveicolo*, M.Sc. in Automotive Eng.

- In A.Y. 2006/2007, 2007/2008 and 2009/2010, *Componenti e sistemi oleodinamici*, M.Sc. in Mechanical Eng.

COORDINATION OF RESEARCH AND TECHNOLOGY TRANSFER PROJECTS

Local coordinator of regional research projects, awarded through a peer-review process:

- 2018-2020: *INDWEY - INDustrializazzion of Working Electric hYbrid vehicles*, presented within the Bando Regionale della regione Piemonte IR2 (IERREQUADRO) - Industrializzazione dei Risultati della Ricerca, Linea di Azione I.1b.1.1 del FESR 2014/2020.

Scientific coordinator of commercial projects:

- 2022: *Sviluppo di modelli di simulazione a parametri concentrati per pompe a pistoni*, Casappa SpA.
- 2020: *Simulazione del circuito lubrificazione di un power divider di un veicolo antincendio*, Fresia SpA.
- 2019-2021: *Sviluppo di modelli tribologici e termoidraulici di pompe a pistoni assiali*, Casappa S.p.A.
- 2017-2018: *Modellazione di pompe a pistoni assiali*, Casappa S.p.A.
- 2014: *Implementazione di modelli avanzati di fluido nei codici di calcolo per pompe di lubrificazione in ambiente AMESim*, Pierburg Pump Technology S.p.A.
- 2014: *Modelling, Simulation and Optimization of cartridge pressure relief valves*, Duplomatic Motion Solution S.p.A.
- 2012-2013: *Modello, Simulazione ed Ottimizzazione di pompa a palette a cilindrata variabile*, Duplomatic Motion Solution S.p.A / Continental Hydraulics.
- 2010: *Modello di simulazione a parametri concentrati di un depressore innovativo per impiego veicolistico*, Pierburg Pump Technology S.p.A.
- 2009: *Attività di analisi dell'interazione tra idraulica e dinamica prevalentemente su pompe olio a cilindrata variabile, attraverso calcoli in Co-simulazione AMESim/ADAMS*, Pierburg Pump Technology S.p.A.

BIBLIOMETRIC INDICES (02/03/2022):

- Total number of Scopus indexed publications: 48
- Total citations: 743 (Scopus), 1049 (Google Scholar)
- Citations received in the last 15 years: 701 (Scopus)
- Total H-index: 16 (Scopus)
- H-index of the papers published in the last 15 years: 13 (Scopus)

LIST OF INTERNATIONAL JOURNALS PEER-REVIEWED PUBLICATIONS

1. Rundo M, Casoli P, Lettini A, *Experimental methods for measuring the viscous friction coefficient in hydraulic spool valves*, *Sustainability* **13**(13), 7174, 2021.
2. Casoli P, Scolari F, Rundo M, *Modelling and validation of cavitating orifice flow in hydraulic systems*, *Sustainability*, **13**(13), 7239, 2021.
3. Corvaglia A, Rundo M, Casoli P, Lettini A, *Evaluation of Tooth Space Pressure and Incomplete Filling in External Gear Pumps by Means of Three-dimensional CFD Simulations*, *Energies* **14**(2), 342, 2021.

4. Casoli P, Scolari F, Rundo M, Lettini A, Rigosi M, *CFD Analyses of Textured Surfaces for Tribological Improvements in Hydraulic Pumps*, *Energies* **13**(21), 2020.
5. Corvaglia A, Ferrari A, Rundo M, Vento O, *Three-dimensional model of an external gear pump with an experimental evaluation of the flow ripple*, *Proc. IMechE Part C*, in press, 2020.
6. Casoli P, Scolari F, Minav T, Rundo M, *Comparative Energy Analysis of a Load Sensing System and a Zonal Hydraulics for a 9-Tonne Excavator*, *Actuators* **9**(2), 2020.
7. Padovani D, Rundo M, Altare G, *The Working Hydraulics of Valve-Controlled Mobile Machines: Classification and Review*, *J. Dyn. Syst. Meas. Control*, **142**(7), 2020.
8. Casoli P, Pastori M, Scolari F, Rundo M, *Active Pressure Ripple Control in Axial Piston Pumps through High-Frequency Swash Plate Oscillations—A Theoretical Analysis*, *Energies*, **12**(7), 2019.
9. Casoli P, Pastori M, Scolari F, Rundo M, *A Vibration Signal-Based Method for Fault Identification and Classification in Hydraulic Axial Piston Pumps*, *Energies*, **12**(5), 2019.
10. Rundo M, Altare G, Casoli P, *Simulation of the Filling Capability in Vane Pumps*, *Energies* **12**(2), 2019.
11. Ferrari A, Pizzo P, Rundo M, *Modelling and experimental studies on a proportional valve using an innovative dynamic flow-rate measurement in fluid power systems*, *Proc. IMechE Part C* **232**(13), 2018.
12. Rundo M, Squarcini R, Furno F, *Modelling of a Variable Displacement Lubricating Pump with Air Dissolution Dynamics*, *Int. J. Engines* **11**(2), 2018.
13. Rundo M, Altare G, *Lumped Parameter and Three-Dimensional Computational Fluid Dynamics Simulation of a Variable Displacement Vane Pump for Engine Lubrication*, *J. Fluid. Eng.* **140**(6), 2018.
14. Rundo M, *Models for Flow Rate Simulation in Gear Pumps: A Review*, *Energies* **10**(9), 2017.
15. Finesso R, Rundo M, *Numerical and experimental investigation on a conical poppet relief valve with flow force compensation*, *Int. J. Fluid Power* **18**(2), 2017.
16. Altare G, Rundo M, *Advances in simulation of gerotor pumps: An integrated approach*, *Proc. IMechE Part C* **231**(7), 2017.
17. Rundo M, *Theoretical flow rate in crescent pumps*, *Simul. Model. Pract. Theory* **71**, 2017.
18. Rundo M, Corvaglia A, *Lumped Parameters Model of a Crescent Pump*, *Energies*, **9**(11), 2016.
19. Altare G, Rundo M, *Computational Fluid Dynamics Analysis of gerotor lubricating pumps at high speed: geometric features influencing the filling capability*, *J. Fluid. Eng.* **138**(11), 2016.
20. Rundo M, Nervegna N, *Lubrication Pumps for Internal Combustion Engines: a Review*, *Int. J. Fluid Power* **16**(2), 2015.
21. Rundo M, Squarcini R, *Modelling and Simulation of Brake Booster Vacuum Pumps*, *Int. J. Commer. Veh.* **6**(1), 2013.
22. Altare G, Lovuolo F, Nervegna N, Rundo M, *Coupled Simulation of a Telehandler Forks Handling Hydraulics*, *Int. J. Fluid Power* **13**(2), 2012.
23. Rundo M, *Piloted Displacement Controls for ICE Lubricating Vane Pumps*, *Int J. Fuels Lubr.* **2**(2), 2010.
24. Rundo M, Squarcini R, *Experimental Procedure for Measuring the Energy Consumption of IC Engine Lubricating Pumps during a NEDC Driving Cycle*, *Int. J. Engines* **2**(1), 2009.
25. Rundo M, Nervegna N, *Geometry Assessment of Variable Displacement Vane Pumps*, *J. Dyn. Syst. Meas. Control* **129**(4), 2007.

26. Mancò S, Nervegna N, Rundo M, *A Contribution to the Design of Hydraulic Lube Pumps*, Int. J. Fluid Power **3**(1), 2002.
27. Nervegna N, Mancò S, Rundo M, *Effects of timing and odd/even number of teeth on noise generation of gerotor lubricating pumps for IC engines*, SAE Trans. J. Commer. Veh, **109**(2), 2000.
28. Mancò G, Mancò S, Rundo M, Nervegna N, *Computerized generation of novel gearings for internal combustion engines lubricating pumps*, Int. J. Fluid Power **1**(1), 2000.
29. Fabiani M, Mancò S, Nervegna N, Rundo M et al. *Modelling and Simulation of Gerotor Gearing in Lubricating Oil Pumps*, SAE Trans. J. Engines **108**(3), 1999.
30. Mancò S, Nervegna N, Rundo M et al. *Gerotor Lubricating Oil Pump for IC Engines*, SAE Trans. J. Engines **107**(3), 1998.

PATENTS

- Armenio G, Kiefer C, Rundo M, *Pumping system employing a variable-displacement vane pump*, ITBO20030528 (A1) and WO2005026553 (A1), 24 March 2005.

BOOKS

- Nicola Nervegna and Massimo, *Passi nell'Oleodinamica*, edizioni EPICS, Torino, 2020. ISBN 9788894802153.

AWARDS & AFFILIATIONS

- From 2019, Associate Editor of the *International Journal of Fluid Power* (Scopus indexed).
- From 2017, member of the Advisory Board of the Global Fluid Power Society.
- “Excellence in oral presentation” for the presentation of the paper “Displacement vs. Flow Control in IC Engines Lubricating Pumps” at 2004 SAE World Congress, Detroit, USA.
- “Certificate of appreciation” at 2000 SAE International Off-Highway & Powerplant Congress & Exposition, Milwaukee, USA.

JOURNAL PAPERS REVIEWER (certified by Publons)

Energies; International Journal of Fluid Power; Applied Sciences; Mechanical Systems and Signal Processing; Measurement; Journal of Fluids Engineering; Journal of Verification, Validation and Uncertainty Quantification; Journal of Engineering for Gas Turbines and Power; Mechanism and Machine Theory; Proceedings of IMechE, Part A: Journal of Power and Energy; Proceedings of IMechE, Part C: Journal of Mechanical Engineering Science; Proceedings of IMechE, Part D: Journal of Automobile Engineering; Proceedings of IMechE, Part E: Journal of Process Mechanical Engineering; Journal of Marine Science and Engineering; Mathematical Problems in Engineering; Sustainability; Simulation Modelling Practice and Theory; Journal of Zhejiang University - SCIENCE A; International Journal of Automation Technology; Flow Measurement and Instrumentation; Applied Mathematical Modelling; International Journal of Mechanics and Materials in Design; International Journal of Ambient Energy; Meccanica; Symmetry; IEEE Access; IEEE Transactions on Vehicular Technology; Journal of Radiation Research and Applied Sciences.