RODOLFO TACCANI

CV

Education

University of Trieste - Italy. Master Degree in Mechanical Engineering (Five years of course).
Mark: 110/110.
University of Udine – PhD in chemical and energy technologies

Employment history

10.22-Present Full Professor, University of Trieste – Italy

10.19-Present Prorector for Technology Transfer – University of Trieste

06.97- 10.22 Assistant professor - University of Trieste – Italy

03.95-06.96 Subliutenant - Army Corp of Engineers, (Italian Army)

12.94-06.97 Research and teaching activity at University of Trieste

Research projects (selection)

- Reseach unit responsible in the ECCOMATE Project: Experimental and Computational Tools for Combustion Optimization in Marine and Automotive Engines (2014-2017). Funded by EU FP7.
- Team member of the project:"Energy saving actions in the University of Trieste campus", (2015-2016). Funded internally by the University of Trieste.
- Team member of the research project PIACE – Platform for high efficiency microcogeneration system developmemt (2009-2015), funded by Industria 2015 – Ministero dello sviluppo economico – Italy.
- Reponsible for the research project: "Performance and nano-morphological characterization of fuel cell components" (2013-2014). Funded internally by the University of Trieste.
- Research unit responsible for the project NGShiP "Natural Gas for Ship Propulsion", coordinated by Wartsila and funded by POR-FESR (2010-2013).
- Research unit responsible for the project COFIN / PRIN 2008: Theoretical and experimental study on high temperature PEM fuel cells.
- Responsible of the research project Cellpower, Development of low emission fuel cell generators Phase 2 (2008-2009) – Funded by Regione Friuli Venezia Giulia (Italy).
- Responsible of the research project Cellpower, Development of low emission fuel cell generators Phase 1 (2006-2007) – Funded by Regione Friuli Venezia Giulia (Italy).
- Responsible for the research project "Utilization of biodiesel on urban buses" Funded by Comune di Pordenone - Italy (2005-2006).
- Responsible for the research project " Development of a methanol fuel cell" Funded by AREA Science Park (2005-2006).

- Responsible for the collaboration research project "Development of control algorithm for fuel cell systems" .Funded by Ministero degli Affari Esteri. 2004-2006
- Research unit responsible for the project COFIN / PRIN "Numerical and experimental study of high temperature fuel cells and gas turbine hybrid cycles for energy production from renewable energy sources" (2003-2004).

Industrial research and activity (selection)

- Responsible for the data acquisition system and the performance assessment of a solar cooling plant (2014-2015). Customer AREA Science Park, Trieste, Italy.
- Technical manager for the development of a software tool for the analysis of the oil flow in oil pipeline during displacement operations (2015). Customer SIOT, Trieste, Italy.
- Responsible for the feasibility study of AIP (Air Independent Propulsion) a rescue vessel for Caspian Sea oil rigs (2011). Customer AGIP-KCO.
- Responsible for the data acquisition system of the full scale ice trials on a ice breaking rescue vessel for Caspian Sea oil rigs. (2010). Customer AGIP-KCO.
- Team member of the energy audit in Electrolux production plants in Vallenoncello and Porcia (Italy) Porcia (2010-2011). Customer Electrolux.
- Founder of the University Spin off "Cenergy srl". A company oparing in the sector of the design and implementation of fuel cells power plant (2010).
- Responsible for the design and development of a prototype of a low energy consumption domestic tumble dryer (2009). Customer Electrolux.

Teaching experience

Courses taught at Università di Trieste:
Energy Conversion Systems,
Industrial Energy Conversion Systems,
Mechanical measurement.
PowerPlants.
Lab and practice of *Power Plants, Turbomachinery Design.*
From 2003 to 2008 he has been invited lecturer at University of Lublin (Poland)
2008 invited lecturer at University of Pennsylvania.
2012 invited lecturer at ICAM Tolosa (Francia)
2015 invited lecturer at university of Klaipeda (Lithuania)

Referee for international journal: Applied Energy, Journal of Hydrogen Energy, Energy, ASME Journal of Energy Resources Technologies, Fuel.
Session Chair of many ASME conferences and national and international conferences.

Affiliations

- Cofounder of the Italian Hydrogen Forum.
- Vice - President of the Associazione Termotecnica Italiana (Italian Thermotechnics Association), Friuli Venezia Giulia section.

Pubblications

1) Giadrossi, **R. Taccani**, Ricerche sperimentali sul pompaggio di fluidi bifase, Atti del 53° Congresso Nazionale A.T.I, Firenze, settembre 1998.
2) **R. Taccani**, A. Giadrossi, M. Reini, Allestimento e taratura di un banco prova sperimentale per motori motociclistici, Giornata di studio MIS-MAC, Genova, luglio 1999.
3) M. Reini, **R. Taccani**, A. Tonon, A. Annibale, Valutazione delle prestazioni di un gruppo ENEL da 320 MW secondo l'analisi differenziale delle perdite, Atti del 54° Congresso Nazionale A.T.I., L'Aquila, settembre 1999.
4) **R. Taccani**, V. Pediroda, M. Reini, A. Giadrossi, Slurry pumping: pump performance prediction, Proc. of the 25th Int. Technical Conf. On Coal Utilization & Fuel Systems, Clearwater, FL, USA, marzo 2000, pp. 74-85.
5) **R. Taccani**, Residential co-generation with fuel cells, Journal of Mechanical Engineering pagg. 580-588, n.8 2000, già negli atti del congresso: SITHOK-4, Maribor, Slovenia, Maggio 2000.
6) M. Reini, **R. Taccani**, A. Giadrossi, On Energy Diagnosis of Steam Power Plants: a Comparison among Three Global Losses Formulations, ECOS 2000, Olanda, luglio 2000.
7) **R. Taccani**, A. Giadrossi, D. Del Neri, Pompaggio di fluidi bifase: messa a punto di un impianto sperimentale e della metodologia di prova, 55° Congresso Nazionale A.T.I., Bari, settembre 2000.
8) M. Reini, **R. Taccani**, A. Giadrossi, Sulla definizione della strategia operativa di un sistema cogenerativo basato su motori a combustione interna, 55° Congresso Nazionale A.T.I., Bari, settembre 2000.
9) **R. Taccani**, Solid oxide fuel cells with gas turbine cycles: performance analysis, Fuel Cell Seminar 2000, Portland, Oregon (USA), ottobre 2000.
10) M. Reini, **R. Taccani**, A. Giadrossi, Optimal Operation Of A Diesel Engine Cogeneration System Including Thermal And Mechanical Energy Storage, ECOS 2001, Istanbul, Turchia, luglio 2001, pp. 843-851.
11) **R. Taccani**, Modellizzazione di cicli ibridi ad alta temperatura ad alta efficienza basati su celle a combustibile ad alta temperatura e microturbine, X convegno Tecnologie e sistemi energetici complessi "S. Stecco", Genova, giugno 2001, pp.265-274.
12) M. Reini, **R. Taccani**, A. Giadrossi, Simulazione di un sistema cogenerativo basato su motori a combustione interna, X convegno Tecnologie e sistemi energetici complessi "S. Stecco", Genova, giugno 2001
13) **R. Taccani**, M. Reini, A. Giadrossi, A. Miglioranza, Utilizzo di combustibili alternativi in motori per autotrazione: allestimento di un banco prova e prime prove sperimentali, 56° Congresso Nazionale A.T.I., Napoli, settembre 2001.
14) **R. Taccani**, M. Reini, A. Giadrossi, D. Torbianelli, Utilizzo del biodiesel in motori per autotrazione: prove sperimentali ed analisi dei risultati, Atti del 57° Congresso Nazionale ATI, Pisa, settembre 2002, Vol. VIA, pp. 117-122.
15) M. Reini, **R. Taccani**, Modelling of a cogeneration system based on diesel engines for optimum operation strategies, Atti del Convegno "Energy and Environment in wider European Region", Catez, Slovenia. 3-4 ottobre 2002.
16) M. Reini, R. Taccani, On Energy Diagnosis of Steam Power Plants: a Comparison among three Global Losses Formulation, the Int. J. of Applied Thermodynamics vol.5 (No4) pp. 177-188, dicembre 2002. Scopus: 2-s2.0-0036961498.

17) M. Reini, **R. Taccani**, Improving the Energy Diagnosis of Steam Power Plants Using the Lost Work Impact Formula, the Int. J. of Applied Thermodynamics vol.5 (No4) pp. 189-202, dicembre 2002.
18) **R. Taccani**, R. Radu, M. Reini, A. Giadrossi, Analisi delle prestazioni e della combustione di un motore per autotrazione alimentato a biodiesel 58° Congresso Nazionale A.T.I., Padova, settembre 2003, pp. 1175-1184, ISBN 88-86281-83-8
19) Giadrossi, **R. Taccani**, L. Feruglio, Effetto delle caratteristiche del fluido sulle prestazioni di pompe centrifughe, 58° Congresso Nazionale A.T.I., Padova, settembre 2003, pp. 669-680.
20) R. Radu, **R. Taccani**, Experimental setup for the cyclic variability analysis on a spark ignition engine, 6th International Conference on Engines for Automobile, Capri, settembre 2003, atti su CD.
21) M. Wendeker, G. Litak, **R. Taccani**, A. Giadrossi, Origin of nonperiodic pressure oscillation in spark ignition engine, 6th International Conference on Engines for Automobile, Capri, settembre 2003, atti su CD.
22) G. De Simon, F Parodi, M. Fermeglia, **R. Taccani**, Simulation of process for electrical energy production based on molten carbonate fuel cells, J. of Power Sources, Elsevier, 115, 2003, 210-218.
23) M. Wendeker, **R. Taccani**, A. Malek, J. Czarnigowski, Adaptive control of the fuel cell system, Congresso internazionale Hypothesis, Porto Conte (Alghero), settembre 2003, atti su CD.
24) **R. Taccani**, Impiego dell'idrogeno nelle celle a combustibile: termodinamica fondamentale ed efficienza degli impianti, Atti giornata di studio: Energia con l'idrogeno, Pordenone , marzo 2003, pp 49-54.
25) V. Verda, A. Valero, L. Serra, V. Ranger, A. Zaleta, A. Lazzaretto, A. Toffolo, M. Reini, **R. Taccani**, F. Donatini, E. Trucato, On the thermoeconomic approach to the diagnosis of energy system malfunctions, ECOS 2003, Copenhagen, giugno 2003.
26) **Taccani**, R. Radu, M. Reini, A. Giadrossi, Metodologia di prova per l'analisi delle caratteristiche di funzionamento di autobus urbani alimentati con combustibili alternativi, MIS-MAC VIII - 2004, Prato.
27) M. Reini, **R. Taccani**, Simulation of a CHP plant based on diesel engines using the Aspen Plus shell, ECOS 2004, Guanajuato, Mexico.
28) M. Reini, **R. Taccani**, On the Thermoeconomic Approach to the Diagnosis of Energy System Malfunctions: the Role of the Fuel Impact Formula, Int. J. of Applied Thermodynamics vol.7 (No 2) pp. 61-72, giugno 2004
29) D. Micheli, P. Pinamonti, M. Reini, **R. Taccani**, Application of biomass fed ORC power systems in the furniture manufacturing industrial district of Pordenone: Part II°: development of thermodynamic cycle simulation model, Third International Symposium Energy and Environment 2004, Sorrento 30 settembre 2004.
30) G. Litak, **R. Taccani**, R. Radu, K. Urbanowicz, J. A. Holyst, M. Wendeker, A. Giadrossi, Estimation of a Noise Level Using Coarse-Grained Entropy of Experimental Time Series of Internal Pressure in a Combustion Engine, Chaos, Solitons and Fractals 23 (2005) 1695–1701 – Elsevier.
31) **Taccani, R.**, Radu R., Analisi sperimentale del funzionamento di una cella a combustibile ad elettrolita polimerico, 60° Congresso Nazionale A.T.I., Roma, settembre 2005.
32) G. De Simon, D. Micheli, **R. Taccani**, Analisi delle prestazioni di un gruppo orc operante con diversi tipi di polisilossani, 60° Congresso Nazionale A.T.I., Roma, settembre 2005.
33) D. Micheli, **R.Taccani**, R. Radu, Transient Behaviour Experimental Analisys of High Temperature Fuel Cell/Gas Turbine Hybrid Power Plant, MIS-MAC IX, Trieste, marzo 2006, pp 265-278.

34) **R.Taccani**, R. Radu, Allestimento di un banco prova per il rilievo delle prestazioni di una cella a combustibile ad elettrolita polimerico, MIS-MAC IX, Trieste, marzo 2006, pp 279-288.
35) A. Lazzaretto, A. Toffolo, M. Reini, **R. Taccani**, A. Zaleta-Aguilar, V. Rangel-Hernandez and V. Verda, Four approaches compared on the TADEUS (thermoeconomic approach to the diagnosis of energy utility systems) test case, Energy, Volume 31, Issues 10-11, August 2006, pp. 1586-1613.
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37) R. Radu, **R. Taccani**, Simulink-Femlab Integrated Dynamic Simulation Model for a PEM Fuel Cell System, ASME Journal of Fuel Cell Science and Technology, vol.3, novembre 2006, pp 452-458.
38) **R. Taccani,** L'utilizzo del biodiesel nei motori per autotrazione: prove sperimentali, Biocombustibili, vol. 3, giugno 2006.
39) **R. Taccani**, Utilizzo del biodiesel nei mezzi di trasporto pubblico di Pordenone, Biocombustibili, vol. 4, dicembre 2006.
40) Miroslaw Wendeker, Arkadiusz Malek, Jacek Czarnigowski, **R. Taccani**, Pierre Boulet, Florin Breaban, Adaptive airflow control of the PEM fuel cell system, SAE Paper, JSAE 20077124 SAE 2007-01-2012, pp 565-570.
41) **R. Taccani** *et al.,* contributo nella monografia: I biocarburanti. Le filiere produttive, le tecnologie, i vantaggi ambientali e le prospettive di diffusione, Area Science Park, Progetto Novimpresa, vol. 27, giugno 2007, pp. 89-129.
42) **R. Taccani** *et al.,* contributo nella monografia: Produzione ed utilizzo oli vegetali a scopo energetico in Friuli Venezia Giulia – Potenzialità e prospettive economiche ed ambientali, ERSA, Gorizia, 2007, ISBN 978-88-89402-20-7.
43) **R. Taccani**, R. Radu, Effects of Control Strategies on the Performance of a PEM Fuel Cell Module, Alternative Fuels, International conference, Maribor 2008, atti su CD, ISBN 978-961-248-068-4
44) **R. Taccani**, R. Radu, Utilization of Biodiesel in modern Diesel engines: effects on performance and emissions, Alternative Fuels, International conference, Maribor 2008, atti su CD, ISBN 978-961-248-068-4
45) **R. Taccani**, R. Radu Analisi delle prestazioni di celle a combustibile PEM ad alta temperatura, 63° Congresso Nazionale A.T.I., Palermo, settembre 2008, atti su CD.
46) **R. Taccani**, Il principio di funzionamento e le applicazioni delle celle a combustibile, Rassegna Tecnica del Friuli Venezia Giulia, agosto 2008, pp. 19-22.
47) A.K. Sen, G. Litak, **R. Taccani**, R. Radu, Wavelet Analysis of Cycle-to-Cycle Pressure Variations in an Internal Combustion Engine, Chaos, Solitons and Fractals, 38 (2008) pp 886-893 – Elsevier, WOS: 000257017900030
48) **R. Taccani**, R. Radu Analisi delle prestazioni di celle a combustibile PEM ad alta temperatura, 63° Congresso Nazionale A.T.I., Palermo, settembre 2008, atti su CD.
49) **R. Taccani**, R. Radu, Analisi delle prestazioni di celle a combustibile PEM ad alta temperatura, 64° Congresso Nazionale A.T.I., Montesilvano (PE), 9-11 settembre 2009, atti su CD, ISBN 978-88-87182-37-8.
50) Radu R., Zuliani N., Taccani R. (2009). Sistema di acquisizione e controllo per celle a combustibile. pp.-- -, In: NIDays forum tecnologico sulla progettazione grafica di sistemi. 25.02.2009, Milano.
51) **R. Taccani**, R. Radu, N. Zuliani, A. Damnjanovic, Perfomance Analysis Of HT PEM Fuel Cells, European Fuel Cell Conference, Roma 2009, ISBN 978-88-8286-211-4.

52) **R. Taccani,** R. Radu, N. Zuliani, Design And Experimental Characterization Of A High Temperature Pem Fuel Cell Stack, European Fuel Cell Conference, Roma 2009, ISBN 978-88-8286-211-4.
53) **R. Taccani**, O. De Giacomo, Effect Of Flow Field Design On Performances Of High Temperature Pem Fuel Cells: Experimental Analysis, European Fuel Cell Conference, Roma 2009, ISBN 978-88-8286-211-4.
54) **R. Taccani**, R. Radu, Celle a combustibile PEM ad alta temperatura: analisi delle non uniformità di voltaggio negli stack, 64° Congresso Nazionale A.T.I., Domus de Maria (CA), settembre 2010, atti su CD.
55) Zuliani N., **Taccani R.** (2010). Analisi Teorica delle Prestazioni di un Sistema Cogenerativo Basato su Celle a Combustibile Polimeriche ad Alta Temperatura. ATI Sezione Sardegna - Formato elettronico , pp.-- -, In: 65° Congresso Nazionale ATI . 14-17 settembre 2010, Domus de Maria - Cagliari,
56) Zuliani N., **Taccani R**. (2010). Simulation Model of a High Temperature PEM Fuel Cell Based Cogeneration System. D. Favrat and F. Maréchal, Lausanne: pp.-- -, Vol. 5, In: 23th International Conference on Efficiency, Cost, Optimization, Simulation and Environmental Impact of Energy Systems. June 14-17, 2010, Lausanne, Switzerland.
57) Zuliani N., Radu R., **Taccani R**. (2010). Design and experimental characterization of a 350 W high temperature PEM fuel cell stack. YSESM, pp.87- 91, In: Youth Symposium on Experimental Solid Mechanics. 7 - 9.07.2010, Trieste.
58) Clemente S., Micheli D., Reini M., **Taccani R**. (2010). Modello numerico ed analisi delle prestazioni di cicli ORC con espansore scroll. Eurografica Srl, Cagliari: pp.1- 9, In: 65° Congresso Nazionale ATI. 13-17 settembre 2010, Domus DE Maria (CA),
59) Clemente S., Micheli D., Reini M., **Taccani R**. (2010). Numerical Model and Performance Analysis of a Scroll Machine for ORC Applications. EPFL, Losanna (CH): pp.3-9- 3-18, In: 23rd International Conference on Efficiency, Cost, Optimization, Simulation and Environmental Impact of Energy Systems (ECOS2010). 14-17 June 2010, Losanna (CH).
60) R. Radu, N. Zuliani, **R. Taccani**, Design And Experimental Characterization Of A High Temperature Pem Fuel Cell Stack, Journal of Fuel cell Science and technology, 11/2011 vol. 8 pg 051007 1-5, ISSN 1550-624X.
61) Radu. R., **Taccani R**., Zuliani N. (2011). Utilizzo di un Reformer per l'Alimentazione di una Cella a Combustibile: Analisi del Sistema di Controllo. National Instrument - formato elettronico, pp.-- -, In: 18° NIDays forum tecnologico sulla progettazione grafica di sistemi. 23 febbraio 2011, Milano ,
62) Zuliani N., **Taccani R**., Radu R. (2011). Effects of control strategies on the transient performance of a HTPEM fuel cell system fuelled with propane. ENEA, pp.261- 262, Vol. 1, In: 4th European Fuel Cell Conference & Exhibition. 14-16 dicembre 2011, Roma,
63) **R. Taccani**, N. Zuliani, Effect of flow field design on performances of high temperature PEM fuel cells: Experimental analysis, International Journal of Hydrogen Energy, Volume 36, Issue 16, August 2011, Pages 10282-10287, ISSN: 0360-3199, Five Years IF 4.407.
64) **Taccani R**; Burel F; Clemente S (2011). LNG Powered Ships: Energy, Environmental And Economic Analysis. Mercator Media, pp.153- 162, In: Gas Fuelled Ship Conference 2011. 26-27 October 2011, Rotterdam (The Netherlands),
65) Zuliani N., **Taccani R**., Radu R. (2011). Experimental and Theoretical Performance Analysis of an High Temperature PEM Fuel Cell fed With LPG Using a Compact Steam Reformer. ASME Digital Library, pp.-- -, In: ASME 2011 5th International Conference on Energy Sustainability . 7-10 Agosto 2011, Grand Hyat Washington DC – USA.
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CYCLES. ASME, Atlanta: pp.1- 10, In: ASME 2011 5th International Conference on Energy Sustainability ES2011. August 7-10, 2011, Washington, DC, USA.

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68) F. Burel, **R. Taccani**, N. Zuliani . Improving sustainability of maritime transport through utilization of Liquefied Natural Gas (LNG) for propulsion. In: Proceedings of the 25th ECOS 2012 Conference. PERUGIA, ITALY, JUNE 26-29, 2012

69) F. Burel, **R. Taccani**, N. Zuliani. Gas fuelled ships: effect of LNG plant design and ship operational profile on boil-off and gas composition. In: Gas Fuelled Ships Conference 2012 Conference Handbook. Bergen, Norway, 12-14 September 2012

70) F. Burel, S. Clemente, **R. Taccani**, N. Zuliani. LNG AND FUEL CELLS IN MERCHANT SHIPS: ENVIRONMENTAL AND ECONOMIC CONSIDERATIONS. In: Atti del 67° Congresso Annuale ATI - Trieste. Trieste, 11-14 Settembre 2012

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72) Valle F, Marmiroli B., Amenitsch H., **Taccani R.** (2012). Electron microscopy and small-angle X-ray scattering analysis of the catalyst layer degradation. Associazione Termotecnica Italiana - Sez. Friuli Venezia Giulia, Trieste: pp.1- 7, In: 67° Congresso nazionale ATI - Trieste 2012. Settembre 2012, Trieste.

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75) Burel, F., **Taccani, R.**, Zuliani, N., Improving sustainability of maritime transport through utilization of Liquefied Natural Gas (LNG) for propulsion, Energy, Volume 57, 1 August 2013, Pages 412-420

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80) N. Zuliani, F. Valle, **R. Taccani** (2013). Degrado accelerato di celle a combustibile polimeriche: sistema di acquisizione dati e controllo. National Instrument , pp.0- 1, In: NI LabVIEW Days 2013. settembre 2013, Milano,

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84) R. Radu, **R. Taccani** (2013). Monitoraggio e controllo di un sistema micro-cogenerativo con celle a combustibile. National Instruments Italy, pp.1- 6, In: NI Days 2013. 27/02/2013, Milano.
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87) R. Radu, **R. Taccani**, M. Scagliotti, Carmen Valli, HT PEM FUEL CELL SYSTEM FED WITH BIOGAS FROM ANAEROBIC DIGESTION: FIELD TEST RESULTS AND LESSON LEARNED, European Fuel Cell Conference, 11-13 December 2013, Roma, Italy.
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90) **R. Taccani**, T. Chinese, J.B. Obi, M. Boaro, PERFORMANCE DEGRADATION STUDY ON POLYBENZIMIDAZOLE FUEL CELLS SUBJECTED TO DIFFERENT AGEING TESTS, European Fuel Cell Technology & Applications Conference - Piero Lunghi Conference 2015, Naples, Italy.
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