CARLO E.D. RIBOLDI, PhD

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Work Experience

UNIVERSITY RESEARCHER

Department of Aerospace Science and Technology, Politecnico di Milano, Milan, Italy – *May 2008 – Present*

- **Faculty member – Senior Researcher** (tenured) – *since 2020*
  - *Research activities*
    - Unconventional airship deployment mission design
    - Dynamics simulation tool for unconventional airship design
  - *New projects*
    - SIENA (EU H2020) – 'Scalability Investigation of hybrid Electric concepts for Next-generation Aircraft' – collaborator – to start 2021
- **Faculty member – Junior Researcher** (untenured) – *2017 - 2020, 3 yr.*
  - *Research activities*
    - Design methodologies and tools for hybrid-electric aircraft
    - Integrated optimal design and mission planning of hybrid-electric aircraft
    - Aero-acoustic footprint prediction for aircraft with innovative propulsion
    - Analysis of infrastructure-level impact of hybrid-electric micro-feeder and mini-liner concepts
    - Optimal design of aircraft propellers
    - Optimal design of three-surface aircraft with deflectable fore surface
  - *New projects*
    - MAHEPA (EU H2020) – 'Modular Approach to Hybrid-Electric Propulsion Architecture' – collaborator – 2017 - ongoing
    - UNIFIER19 (EU H2020) – 'Community-Friendly Mini-Liner' – collaborator – 2019 - ongoing
- **Post-Doc Researcher** – *2012 - 2017, 6 yr.*
  - *Research Activities*
    - Design and implementation of rotorcraft simulation tools
    - Aero-elastic, multi-body simulation of rotorcrafts
    - Model-based control laws for helicopters for noise footprint reduction
    - Observation of relative rotorcraft-wind orientation from rotor attitude
    - Design of sizing procedures for fixed-wing aircraft featuring a high share of novel technology
    - Multi-body simulation of internal combustion engines for aircraft application
    - Wind state observation through analysis of aero-elastic deformation of wind turbine rotors
    - Design of optimal shut-down maneuvers for wind turbines
    - Optimal tuning procedures of control laws for load mitigation for large wind turbines
  - *New projects*
    - MANOEUVRES (EU Clean Sky) - 'Manoeuvering Noise Evaluation Using Validated Rotor State Estimation Systems' – collaborator – *2013-2015 (project concluded)*
- **Ph.D. Candidate** – *2009 - 2012, 3 yr.*
  - Design and implementation of controllers for smart trimming and load mitigation on wind turbine rotors
  - LiDAR assisted predictive control for wind turbines
  - Observation of wind turbine deformation and wind states
- **Research Engineer** – *2008, 6 mth.*
  - Model-based controllers for load mitigation of wind turbines

UNIVERSITY TEACHER

Department of Aerospace Science and Technology, Politecnico di Milano, Milan, Italy – *March 2011 - Present*

- **Lecturer**, 3rd year undergraduate course of **Flight Mechanics** – *since 2015*
- **Assistant Professor,**
  graduate course of **Aircraft Design** – *since 2013*
  graduate course of **Design of Wind Turbines** – *2012 - 2015.*

undergraduate course of **Flight Mechanics** – *2011 - 2014*
undergraduate course of **Introduction to Flight** – *2016*

- Board member of the master course of **Fundamentals of the Air Transport System** (since 2018, vice-director since 2020)
- Board member of the **Doctoral School in Aerospace Engineering** (since 2019)
- Manager for the **experimental flight activities** for the course of Flight Mechanics
- Master's **thesis tutor** for >20 students
- **Project advisor** for 5 international award-winning student's aircraft design

Collaborations - Academic & Industrial

- Pipistrel d.o.o. Ajdovscina - *since 2017*
- Raytheon Technology Research Center – *since 2020*
- Technische Universiteit Delft, Delft, The Netherlands - *since 2017*
- Technische Universität München, Garching bei München, Germany - *since 2013*
- Leonardo-Helicopters (ex-Agusta-Westland), Cardano al Campo, Italia - *since 2013*
- IMT Engineering, Gorgonzola, Italia - *since 2012*
- Aalborg University, Aalborg, Denmark - *2010-2012*
- Clipper Wind Power, Inc., Santa Barbara, California - *2009-2013*
- National Renewable Energy Laboratory, Boulder, Colorado - *since 2008*
- Kangwon National University, Chooncheon, South Korea - *2008-2012*
- LeitWind AG, Bozen, Italia - *2007-2014*

Education

PHD, AEROSPACE ENGINEERING, with Merit – Politecnico di Milano, 2012

- Advanced control for horizontal-axis wind turbines and supporting enabling technologies –

Advisor: prof. Carlo L. Bottasso

POST-GRADUATE MASTER, AIRPORT MANAGEMENT – Politecnico di Milano, 2009

- The situation of Malpensa airport in 2009: an analysis of the effects of politics on industries and commerce –

Advisor: dott. Laura Tamborini

MASTER OF SCIENCE, AERONAUTICAL ENGINEERING, cum Laude – Politecnico di Milano, 2008

- Cyclic control of wind turbines - design and implementation –

Advisor: prof. Carlo L. Bottasso

BACHELOR OF SCIENCE, AERONAUTICAL ENGINEERING, cum Laude – Politecnico di Milano, 2005

- Preliminary design of the combustion chamber of a military-purpose mixed-flow turbofan engine –

Advisor: prof. Luciano Galfetti

Language Skills

ITALIAN, mother tongue

ENGLISH, fluent

- Professional experience in Italian to English translation
- Six-months individual course of spoken English, by InLingua Language School
- TOEFL certified

RUSSIAN, basic

- Four-months individual course of Russian with mother tongue teacher by InLingua Language School

Software & Programming Skills

- Cp-Lambda
- FAST
- Femap
- Nastran
- Code::Blocks
- GNU GCC/G95
- Microsoft Office
- Matlab/Simulink
- Windows OS
- C/C++
- Fortran 77/90
- HTML/CSS

- LaTeX/BibTeX
- Noesis Optimus
- Microsoft Office
- Google Analytics
- WordPress CMS
- Compaq Visual Fortran
- Microsoft Visual Studio
- Java TDK

Professional Certifications

- Qualified to the role of Associate Professor, Italian Ministry of Research, *8 Aug. 2018* (A.S.N. professore II° fascia, S.C. 09/A1 Ingegneria Aeronautica, Aerospaziale e Navale)
- Recipient of FFABR financial grant for research, Italian Ministry of Research (*2017*)
- Member of REPRISE – Panel of experienced scientists of the Italian Ministry of Research (*since 2018*) – Research area ING-IND03/Flight Mechanics
- Sustained Italian State Exam for Engineers, *Sept. 2008*

Prizes

- 1st prize AIAA Student Competition 2020, aircraft design competition - team "Aeroswitch", technical advisor
- Best Post-Doc Paper Award 'Giorgio Cavallini', 2017, Italian Association of Aeronautics and Astronautics (AIDAA)
- 1st prize AIAA Student Competition 2015, aircraft design competition - team "Flynk", technical advisor
- Best Master's graduated student in Aeronautical Engineering at Politecnico di Milano, academic year 2006-07

Dissemination Activities

BOOKS

- Giorgio Guglieri, Carlo E.D. Riboldi, "Introduction to Flight Dynamics", Celid, Torino, 2014, ISBN-13 9788867890422
- L. Sartori, S. Cacciola, A. Croce, C.E.D. Riboldi, "A research framework for the multi-disciplinary design and optimization of wind turbines", book chapter, in "Optimization of Wind Energy Conversion Systems", IntechOpen, London, 2020, ISBN-13 978-1-78984-407-8

JOURNAL PAPERS

- C.L. Bottasso, A. Croce, C.E.D. Riboldi, Y. Nam, "Power Curve Tracking in the Presence of a Tip Speed Constraint", Renewable Energy, Elsevier, Vol.40 N.1, 2012
- C.L. Bottasso, A. Croce, C.E.D. Riboldi, Y. Nam, "Multi-Layer Control Architecture for the Reduction of Deterministic and Non-Deterministic Loads on Wind Turbines", Renewable Energy, Elsevier, Vol. 51, 2013
- C.L Bottasso, C.E.D. Riboldi, "Estimation of Wind Misalignment and Vertical Shear from Blade Loads", Renewable Energy, Elsevier, Vol.62, February 2014
- C.L. Bottasso, P. Pizzinelli, C.E.D. Riboldi, L. Tasca "LiDAR-Enabled Model Predictive Control of Wind Turbines with Real-Time Capabilities", Renewable Energy, Elsevier, Vol.71, 2014
- C.L. Bottasso, A. Croce, C.E.D. Riboldi, "Optimal shutdown management", Journal of Physics: Conference Series, IOP Publishing, Vol. 524, 2014
- C.L. Bottasso, A. Croce, C.E.D. Riboldi, M. Salvetti, "Cyclic pitch control for the reduction of ultimate loads", Journal of Physics: Conference Series, IOP Publishing, Vol. 524, 2014
- C.L. Bottasso, C.E.D. Riboldi, "Validation of a Wind Misalignment Observer using Field Test Data", Renewable Energy, Elsevier, Vol.74, 2015
- L. Trainelli, M. Gennaretti, G. Bernardini, A. Rolando, C.E.D. Riboldi, M. Radaelli, L. Riviello, A. Scandroglio, "Innovative Helicopter In-Flight Noise Monitoring Systems Enabled by Rotor-State Measurements", Noise Mapping, De Gruyter, Vol.3, 2016
- C.L. Bottasso, A. Croce, F. Gualdoni, P. Montinari, C.E.D. Riboldi, "Articulated blade tip devices for load alleviation on wind turbines", Wind Energy Science, Copernicus Publications, June 2016
- C.E.D. Riboldi, "On the optimal tuning of individual pitch control for horizontal-axis wind turbines", Wind Engineering, SAGE UK, Vol.40, 2016
- C.E.D. Riboldi, F. Gualdoni, "An Integrated Approach to the Preliminary Weight Sizing of Small Electric Aircraft", Aerospace Science and Technology, Elsevier, August 2016
- Croce, F. Gualdoni, P. Montinari, C.E.D. Riboldi, C.L. Bottasso, "Inertial and aerodynamic tuning of passive devices for load alleviation on wind turbines", Journal of Physics: Conference Series, Vol. 753, 2016
- C.E.D. Riboldi, S. Cacciola, "Individual pitch control for 2-bladed wind turbines via multiblade multilag transformation", Wind Energy, Vol. 20, 2017
- S. Cacciola, C.E.D. Riboldi, "Equalizing aerodynamic blade loads through individual pitch control via multiblade multilag transformation",

Journal of Solar Energy Engineering, Transactions of the ASME, Vol.139, 2017

- C.E.D. Riboldi, F. Gualdoni, L. Trainelli, “Preliminary weight sizing of light pure-electric and hybrid-electric aircraft”, Transport Research Procedia, Vol. 29, 2018
- S. Cacciola, C.E.D. Riboldi, A. Croce, “Monitoring rotor aerodynamic and mass imbalances through a self-balancing control”, Journal of Physics: Conference Series, Vol. 1037, 2018
- Croce, S. Cacciola, C.E.D. Riboldi, L. Sartori, “The Science of Making Torque from Wind (TORQUE 2018)”, editorial, Journal of Physics: Conference Series, Vol. 1037, 2018
- C.E.D. Riboldi, “An optimal approach to the preliminary design of small hybrid-electric aircraft”, Aerospace Science and Technology, Vol. 81, 2018
- C.E.D. Riboldi, “Energy-optimal off-design power management for hybrid-electric aircraft”, Aerospace Science and Technology, Vol. 95, 2019
- C.E.D. Riboldi, L. Trainelli, F. Biondani, “Structural batteries in aviation: a preliminary sizing methodology”, Journal of Aerospace Engineering, Vol. 33, 2020
- C.E.D. Riboldi, L. Trainelli, L. Mariani, A. Rolando, F. Salucci, “Predicting the effect of electric and hybrid-electric aviation on acoustic pollution”, Noise Mapping, Vol. 7, 2020

CONFERENCE PAPERS

- C.L. Bottasso, A. Croce, C.E.D. Riboldi, G.S. Bir, “Real-Time Estimation of Structural and Wind States for Wind Turbine Advanced Control”, European Wind Energy Conference & Exhibition (EWEC 2009), Marseille, France, March 16-19, 2009
- C.L. Bottasso, A. Croce, C.E.D. Riboldi, “Computing Spatial Estimates of the Over-the-Rotor Wind Distribution for Advanced Wind Turbine Active Control”, 5th European and African Conference on Wind Engineering (EACWE 5), Firenze University Press, Firenze, 2009
- C.L. Bottasso, A. Croce, C.E.D. Riboldi, G.S. Bir, “Spatial Estimation of Wind States from the Aeroelastic Response of a Wind Turbine”, Torque 2010 -The Science of Making Torque from Wind, Heraklion, Crete, June 28-30, 2010
- C.L. Bottasso, C.E.D. Riboldi, “Higher-Harmonic Control of Wind Turbines”, European Wind Energy Conference & Exhibition 2011 (EWEC 2011), Curran Associates, Red Hook, NY, 2011
- C.L. Bottasso, P. Pizzinelli, C.E.D. Riboldi, “LiDAR-Enabled Predictive Control of Wind Turbines with Real-Time Capabilities”, Torque 2012 – The Science of Making Torque from Wind, Oldenburg, Germany, October 9-11, 2012
- C.L. Bottasso, C.E.D. Riboldi, “Observation of Wind Misalignment from Blade Loads”, The Science of Making Torque from Wind 2012, Oldenburg, Germany, October 9-11, 2012
- C.L. Bottasso, C.E.D. Riboldi, “LiDAR-Enabled Real-Time Control of Wind Turbines”, European Wind Energy Association Annual Event (EWEA 2013), Vienna, Austria, February 4-7, 2013
- C.L. Bottasso, C.E.D. Riboldi, “Wind Estimation by Blade Loads”, European Wind Energy Association Annual Event (EWEA 2013), Vienna, Austria, February 4-7, 2013
- C.L. Bottasso, C.E.D. Riboldi, “Improved Wind Direction Measurement through Blade Loads”, 69th American Helicopter Society International Annual Forum 2013, Curran Associates, Red Hook, NY, 2013
- L. Trainelli, A. Croce, C.E.D. Riboldi, R. Possamai, A. Castagnoli, “Multibody Modelling of a Novel Two-Bladed Helicopter: Trim Studies”, Multibody Dynamics 2015, CIMNE, Barcelona, 2015
- L. Trainelli, A. Croce, C.E.D. Riboldi, R. Possamai, “Dynamic Characterization of a Novel Gimbal Two-Blade Helicopter Rotor”, 71st American Helicopter Society International Annual Forum 2015, Curran Associates, Red Hook, NY, 2015
- L. Trainelli, C.E.D. Riboldi, M. Bucari, "Observing the Angle of Attack of the Tip Path Plane from Rotor Blade Measurements", 41st European Rotorcraft Forum (ERF2014), Munich, Germany, September 1-4, 2015
- Rolando, F. Rossi, C.E.D. Riboldi, L. Trainelli, R. Grassetti, D. Leonello, M. Redaelli, "The Pilot Acoustic Indicator: A Novel Cockpit Instrument for the Greener Helicopter Pilot", 41st European Rotorcraft Forum (ERF2014), Munich, Germany, September 1-4, 2015
- L. Trainelli, C.E.D. Riboldi, “Hybris – An Innovative Concept for Future General Aviation”, 13th Pegasus-AIAA Student Conference, Berlin, Germany, April 5-7, 2017
- S. Cacciola, C.E.D. Riboldi, A. Croce, “A New Decentralized Pitch Control Scheme for Wind Turbines”, 20th World Congress of the International Federation of Automatic Control (IFAC 2017), Toulouse, France, July 9-14, 2017
- L. Trainelli, C.E.D. Riboldi, “Developing an Observation Methodology for Non-Measurable Rotorcraft States”, 43rd European Rotorcraft Forum (ERF 2017), Milan, Italy, September 12-15, 2017
- C.E.D. Riboldi, L. Trainelli, S. Cacciola, “A Model-Based Design Framework for Rotorcraft Trim Control Laws”, 43rd European Rotorcraft Forum (ERF 2017), Milan, Italy, September 12-15, 2017
- Croce, C.E.D. Riboldi, L. Trainelli, M. Amoozgar., “Basic Aeroelastic Stability Studies of Hingeless Rotor Blades in Hover Using Geometrically Exact Beam and Finite-State Inflow”, 43rd European Rotorcraft Forum (ERF 2017), Milan, Italy, September 12-15, 2017
- C.E.D. Riboldi, L. Trainelli, “Conceptual Design of a Structural-Battery Hybrid-Electric Aircraft”, 24th Conference of the Italian Association of Aeronautics and Astronautics (AIDAA 2017), Palermo - Enna, Italy, September 18-22, 2017 – awarded Best Post-Doc Paper prize ‘Giorgio Cavallini’ 2017

- C.E.D. Riboldi, L. Trainelli, “Flynk - the Future All-Electric Commuter Concept for Metropolitan Areas”, 24th Conference of the Italian Association of Aeronautics and Astronautics (AIDAA 2017), Palermo - Enna, Italy, September 18-22, 2017
- L. Trainelli, C.E.D. Riboldi, “Award-Winning Innovative Aircraft Design Projects at Politecnico di Milano”, Aerospace Europe CEAS 2017 Conference. European Aerospace "Quo Vadis?", Bucharest, Romania, October 16-20, 2017
- F. Bigoni, A. Moreno-Perez, F. Salucci, C.E.D. Riboldi, A. Rolando, L. Trainelli, “Design of Airport Infrastructures in Support of the Transition to a Hybrid-Electric Fleet”, Advanced Aircraft Efficiency in a Global Air Transport System Conference (AEGATS 2018), Toulouse, France, October 23-25, 2018
- C.E.D. Riboldi, “Weight-Optimal Design of Light Hybrid-Electric Aircraft”, Advanced Aircraft Efficiency in a Global Air Transport System Conference (AEGATS 2018), Toulouse, France, October 23-25, 2018
- C.E.D. Riboldi, L. Trainelli, F. Biondani, “A Sizing Procedure for Structural Batteries in Hybrid-Electric Aircraft”, Advanced Aircraft Efficiency in a Global Air Transport System Conference (AEGATS 2018), Toulouse, France, October 23-25, 2018
- L. Trainelli, A. Rolando, C.E.D. Riboldi, F.Salucci, “Evaluating The Impact Of Fleet Switching To Hybrid-Electric Aircraft On Airport Infrastructures”, MEA2019 - More Electric Aircraft, Toulouse, France, 6-7 Feb. 2019
- L. Trainelli, N. Rossi, F.Salucci, C.E.D. Riboldi, A. Rolando, “Preliminary Sizing and Energy Management of Serial Hybrid-Electric Airplanes”, 25th Conference of the Italian Association of Aeronautics and Astronautics (AIDAA 2019), Rome, Italy, 9-12 Sep. 2019
- L. Trainelli, D. Comincini, F.Salucci, A. Rolando, C.E.D. Riboldi, “Sizing and Performance of Hydrogen-Driven Airplanes”, 25th Conference of the Italian Association of Aeronautics and Astronautics (AIDAA 2019), Rome, Italy, 9-12 Sep. 2019
- C.E.D. Riboldi, F. Bigoni, F.Salucci, A. Rolando, L. Trainelli, “Switching to Electric Propulsion: Aero Club Fleet and Infrastructure Sizing”, 25th Conference of the Italian Association of Aeronautics and Astronautics (AIDAA 2019), Rome, Italy, 9-12 Sep. 2019
- C.E.D. Riboldi, L. Mariani, L. Trainelli, A. Rolando, F. Salucci, “Assessing the effect of hybrid-electric power-trains on acoustic and chemical pollution”, Aerospace Europe Conference 2020 (AEC2020), Bordeaux, France, 25-28 Feb. 2020
- L. Trainelli, M. Bruglieri, C.E.D. Riboldi, F. Salucci, D. Gabrielli, “Optimal definition of a short haul air transportation network for door to door mobility”, Aerospace Europe Conference 2020 (AEC2020), Bordeaux, France, 25-28 Feb. 2020
- Rolando, F. Salucci, Y.M. Khan, L. Trainelli, C.E.D. Riboldi, “On the design of an electric-powered micro-feeder aircraft”, Aerospace Europe Conference 2020 (AEC2020), Bordeaux, France, 25-28 Feb. 2020
- F. Salucci, C.E.D. Riboldi, L. Trainelli, A. Rolando, “Optimal recharging infrastructure sizing and operations for a regional airport”, Aerospace Europe Conference 2020 (AEC2020), Bordeaux, France, 25-28 Feb. 2020
- L. Trainelli, C.E.D. Riboldi, F. Salucci, A. Rolando, “A general preliminary sizing procedure for pure-electric and hybrid-electric airplanes”, Aerospace Europe Conference 2020 (AEC2020), Bordeaux, France, 25-28 Feb. 2020

PHD THESIS

- Carlo E.D. Riboldi, “Advanced control laws for variable-speed wind turbines and supporting enabling technologies”, Politecnico di Milano, 2012. Link: https://www.politesi.polimi.it/handle/10589/56887

PATENTS

- Bernasconi, F. Biondani, L. Capoferri, A. Favier, C. Velarde Lopez De Ayala, F. Gualdoni, C.E.D. Riboldi, L. Trainelli, “Velivolo con batterie elettriche, in particolare velivolo ibrido”, Italian patent 102016000114808, 2016
- Bernasconi, F. Biondani, L. Capoferri, A. Favier, C. Velarde Lopez De Ayala, F. Gualdoni, C.E.D. Riboldi, L. Trainelli, “Aircraft with electric battery, in particular hybrid aircraft”, European patent PCT/EP2017/078728, 2017
- L. Alberti, D. Pasquali, A. Santeramo, M. Tombolini, C.E.D. Riboldi, L. Trainelli, “Velivolo plurimotore simulante un monomotore via hardware e software”, Italian patent, filed May 2020, pending

CONFERENCES

- 5th European and African Conference on Wind Engineering (EACWE 5), Firenze, 2009
- Torque 2010 -The Science of Making Torque from Wind, Heraklion, Crete, June 28-30, 2010
- Torque 2012 – The Science of Making Torque from Wind, Oldenburg, Germany, October 9-11, 2012
- European Wind Energy Association Annual Event (EWEA 2013), Vienna, Austria, February 4-7, 2013
- 71st American Helicopter Society International Annual Forum 2015, Virginia Beach, VA, May 5-7, 2015
- 41st European Rotorcraft Forum (ERF2014), Munich, Germany, September 1-4, 2015
- 20th World Congress of the International Federation of Automatic Control (IFAC 2017), Toulouse, France, July 9-14, 2017
- 43rd European Rotorcraft Forum (ERF 2017), Milan, Italy, September 12-15, 2017
- 24th Conference of the Italian Association of Aeronautics and Astronautics (AIDAA 2017), Palermo - Enna, Italy, September 18-22, 2017
- Aerospace Europe CEAS 2017 Conference. European Aerospace "Quo Vadis?", Bucharest, Romania, October 16-20, 2017
- Advanced Aircraft Efficiency in a Global Air Transport System Conference (AEGATS 2018), Toulouse, France, October 23-25, 2018
- MEA2019 - More Electric Aircraft, Toulouse, France, 6-7 Feb. 2019

- 25th Conference of the Italian Association of Aeronautics and Astronautics (AIDAA 2019), Rome, Italy, 9-12 Sep. 2019
- Aerospace Europe Conference 2020 (AEC2020), Bordeaux, France, 25-28 Feb. 2020

Licenses

- Driving license for cars, granted 2003
- Private pilot license PPL(A)-VFR, granted 2013, current
- Advanced Ultralight pilot license, granted 2017, current

Other Professional Interests

ARCHITECTURE AND URBEX PHOTOGRAPHY

- Urban exploration (URBEX) mission planning consultant, especially for Countries of the former eastern bloc
- Adventure photography consultant in challenging scenarios
- Photography provider for historians, books and documentary productions (past collaboration with Talos Films, NY, past and ongoing collaboration with more than 5 private book authors)
- Landscape and architecture air photography
- Website owner and master – topics: architecture and travel photography

Personal Interests and Free Time Activities

AERONAUTICS

- Aircraft piloting – adventure flight mission planning and execution
- Aviation history, especially military aviation and weaponry of the early Cold War period
- History of airborne nuclear deterrent and stockpile
- Aircraft engines and propulsion techniques

TRAVELING

- Frequent traveler/solo traveler to the US, Canada, Russia, Ukraine, South Korea, and > 25 European and Middle East Countries
- Semi-professional photographer of architecture and nature
- Frequent attendee to airshows all over the world, aircraft photographer
- Urbex missions in foreign countries

MUSIC

- Classical music, frequent attendee to concerts and recitals, especially interested in late-romantic and early modern period
- Collector of historical recordings and LPs
- Good skill at the piano, 10 years of private lessons

SPORT ACTIVITIES

Aircraft piloting, running, skiing, body building, cycling, mountain hiking, kayaking

HOBBIES

Everything aviation, military history, classic cars and motorcycles, static aircraft modeling