

CURRICULUM VITAE ET STUDIORUM

UPDATED: 15 DECEMBER 2025

Personal Information



LAST AND FIRST NAME: Valceschini Nicholas
NATIONALITY: Italian
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SEX: Male

The following document presents a list of personal titles held, according to the scheme established by Ministerial Decree 243 of 25.05.2011

a) Work Experiences

OCTOBER 2023 - Present

Assistant professor

University of Bergamo, Dalmine (BG) Italy, at: Control Systems and Automation Laboratory

OCTOBER 2022 - OCTOBER 2023

Postdoctoral Researcher

University of Bergamo, Dalmine (BG) Italy, at: Control Systems and Automation Laboratory

OCTOBER 2019 - SEPTEMBER 2022

Ph.D in Engineering and Applied Sciences

University of Bergamo, Dalmine (BG) Italy, at: Control Systems and Automation Laboratory

THESIS TITLE: *Data-driven robust control and diagnosis: Theory and Application*

SUPERVISORS: Prof. Mirko Mazzoleni, Prof. Fabio Previdi and Prof. Simone Formentin

REVIEWERS: Prof. Fabrizio Dabbene and Prof. Alireza Karimi

ORIENTATIONS: System identification and Control, Fault diagnosis and Machine learning

GRADE: Excellent

Other titles:

- Master degree (cum laude) in Computer Science Engineering (Industrial curriculum).
PERIOD: September 2017 - September 2019.
AT: University of Bergamo.
THESIS TITLE: Dynamic Texture identification and synthesis using data-driven approaches.
SUPERVISOR: Mirko Mazzoleni.
GRADE: 110L/110.
- Bachelor degree (cum laude) in Computer Science Engineering (Industrial curriculum).
PERIOD: September 2014 - July 2017.
AT: University of Bergamo.
THESIS TITLE: Position estimation of a sliding gate using motor-side inertial measurements.
SUPERVISOR: Fabio Previdi.
GRADE: 95/110.

b) Teaching activities at university level in Italy (or foreign)

- **Lecturer :**

- academic year 2022/2023
 - * Mechanical system control
February 2023 - May 2023
Second year of M.Sc. in Mechatronics and Smart Technology Engineering
CLASS HOURS: 40h
AT: University of Bergamo (Italy).
 - * Mechanical system control
February 2024 - May 2024
Second year of M.Sc. in Mechatronics and Smart Technology Engineering
CLASS HOURS: 40h
AT: University of Bergamo (Italy).
 - * Mechanical system control
February 2025 - May 2025
Second year of M.Sc. in Mechatronics and Smart Technology Engineering
CLASS HOURS: 40h
AT: University of Bergamo (Italy).

- **Lecturer Assistant:**

- academic year 2022/2023
 - * Model Identification and Data analysis (in Italian)
October 2022 - December 2022
First year of M.Sc. in Computer science Engineering
CLASS HOURS: 12h
AT: University of Bergamo (Italy).
- academic year 2021/2022
 - * Automation (in Italian)
February 2022 - May 2022
Third year of B.Sc. in Management Engineering
CLASS HOURS: 24h
AT: University of Bergamo (Italy).
 - * Data analysis Lab (in Italian)
February 2022 - May 2022
Second year of M.Sc. in Engineering and Management for Health
CLASS HOURS: 10h
AT: University of Bergamo (Italy).
 - * Model Identification and Data analysis (in Italian)
October 2021 - December 2021
First year of M.Sc. in Computer science Engineering
CLASS HOURS: 12h
AT: University of Bergamo (Italy).
- academic year 2020/2021
 - * Automation (in Italian)
February 2021 - May 2021
Third year of B.Sc. in Management Engineering
CLASS HOURS: 24h
AT: University of Bergamo (Italy).
- academic year 2019/2020
 - * Automation (in Italian)
February 2020 - May 2020
Third year of B.Sc. in Management Engineering
CLASS HOURS: 24h
AT: University of Bergamo (Italy).

* Data analysis Lab (in Italian)
February 2020 - May 2020
Second year of M.Sc. in Engineering and Management for Health
CLASS HOURS: 10h
AT: University of Bergamo (Italy).

• **Advisor** of the following Master's Degree Theses:

- *LiDAR-Based Cyclist Detection and Behaviour Analysis Using Deep Learning Techniques*, M.Sc. program in Computer Science Engineering. STUDENT: Cristian Sacco. ACADEMIC YEAR: 2024/2025. AT: University of Bergamo (Italy).
- *Design and Prototyping of a Bicycle Tyre Pressure Control System*, M.Sc. program in Mechatronics and Smart Technology Engineering. STUDENT: Luca Mazzoleni. ACADEMIC YEAR: 2024/2025. AT: University of Bergamo (Italy).
- *Design and control of an independent pedal ergometer for training and rehabilitation*, M.Sc. program in Mechatronics and Smart Technology Engineering. STUDENTS: Lorenzo Palo. ACADEMIC YEAR: 2024/2025. AT: University of Bergamo (Italy).
- *Sensorless angular position estimation of a hybrid stepper motor using an Extended Kalman Filter*, M.Sc. program in Mechatronics and Smart Technology Engineering. STUDENT: Davide Pezzoli. ACADEMIC YEAR: 2024/2025. AT: University of Bergamo (Italy).

• **Co-Advisor** of the following Master's Degree Theses:

- *Fault diagnosis of an EMA applied to hinged gates*, M.Sc. program in Computer Science Engineering. STUDENT: Locatelli Stefano. ACADEMIC YEAR: 2022/2023. ADVISOR: Mirko Mazzoleni. AT: University of Bergamo (Italy).
- *Design a dynamic model and a controller for a blood components extractor*, M.Sc. program in Computer Science Engineering. STUDENT: Gotti Steven. ACADEMIC YEAR: 2021/2022. ADVISOR: Fabio Previdi. AT: University of Bergamo (Italy).
- *Estimation of Buffycoat position during the blood component extraction process*, M.Sc. program in Mechanical Engineering. STUDENTS: Radaelli Martina, Marini Fabrizio. ACADEMIC YEAR: 2021/2022. ADVISOR: Fabio Previdi. AT: University of Bergamo (Italy).
- *Control design based on kernel-based non-parametric model*, M.Sc. program in Computer Science Engineering. STUDENT: Cesani Davide. ACADEMIC YEAR: 2020/2021. ADVISOR: Mirko Mazzoleni. AT: University of Bergamo (Italy).

c) Training or research activities at qualified Italian or foreign institutes

• **Research activities:**

- CONTRACT TYPE: Self-employment contract.
PERIOD: April 2023 - July 2023.
TITLE: *Sviluppo di sistemi di controllo e diagnostica per sistemi meccatronici.* (in italian)
FUNDED BY: DIGIP *Department of Management, Information and Production Engineering of University of Bergamo.*
AT: University of Bergamo.
- CONTRACT TYPE: Self-employment contract.
PERIOD: April 2023 - May 2023.
TITLE: *Scelta, installazione e configurazione di un'architettura di acquisizione e analisi dei dati della linea produttiva all'interno del laboratorio SLIM.* (in italian)
RESEARCH PROJECT: *SLIM Smart Living in Manufacturing.*
FUNDED BY: Lombardy Region
AT: University of Bergamo.

- CONTRACT TYPE: Research grant.
PERIOD: August 2022 - July 2023.
TITLE: *Intelligent Artificial Pancreas: development of learning-based Model Predictive Control strategies, based on Gaussian Processes.*
FUNDED BY: DIGIP Department of Management, Information and Production Engineering of University of Bergamo.
AT: University of Bergamo.

- CONTRACT TYPE: Research grant.
PERIOD: February 2020 - July 2022.
TITLE: *Progetto di controllori basati su modelli non parametrici per la manutenzione predittiva di componenti di sistemi produttivi.*(in italian)
RESEARCH PROJECT: SMART4CPPS *Smart Solution for Cyber Physical Production Systems.* Total Budget: 7405k - Budget Unibg: 694k.
Partners: C.M.S. Costruzioni macchine speciali S.p.A, Ratti S.p.A, Scaglia Indeva S.p.A, Quantra S.r.l., Porta Solutions S.p.A, Cavagna Group (OMECA), Camozzi S.p.A, Balance Systems S.r.l., TXT e-Solutions S.p.A, Fincons S.p.A, Politecnico di Milano, Consiglio Nazionale delle Ricerche - Istituto di Tecnologie Industriali e Automazione, Università degli Studi di Bergamo, Università degli Studi di Brescia.
FUNDED BY: Lombardy Region.
AT: University of Bergamo.

- **Research interest:**

- Robust control and diagnosis based on non-parametric models:
The increasing availability of large amounts of data allows for a change in the paradigms of model design. A field which leverages this rationale is called System identification. In particular, the state-of-the-art of this literature is the kernel methodology, which obtains a non-parametric model without choosing the model family (as with the traditional methods). In light of this, this research line aims to employ the uncertainty information, endowed in these non-parametric models, to design controllers or fault detection algorithms that have the property of robustness against the uncertainty modeled during the identification process. Papers that I've published related to this topic [4] and [8].
- Fault detection and Health monitoring of mechanical components:
Although this line of research is well-known in the literature, the industrial applications of these algorithms have a strong relationship with the industrial process (or mechanical components) under study. Therefore, each industrial problem leads to customization of the general fault detection algorithms, which leads to innovative algorithms that are directly validated on real problems. Papers that I've published related on this topic [6] and [7].
- Control system for artificial pancreas:
The Artificial Pancreas is a breakthrough for diabetics, allowing them to inject insulin automatically. However, each patient has a different response subject to an insulin injection or a meal. In this setting, the traditional control scheme can fail, leading to a critical state for the patient, such as hypoglycemia or hyperglycemia. So, a possible novel way to solve this problem is to apply a Data-driven Model Predictive Control(MPC). This minimizes the distance between a reference behaviour and the open-loop prediction of a system (represented by a model) modeled by a data-driven identification process, such as Gaussian Processes. This is useful when each system(patient) differs from the other. This methodology differs from the literature since each control action is customized with respect to the patient.

e) Involvement in project activities

- **Regional, national and international research projects:**
 - * RESEARCH PROJECT: ANTHEM (*AdvaNced Technology for Human centEred Medicine*).
PERIOD: November 2023 - today.
FUNDED BY: PNC
ROLE: Researcher
 - * RESEARCH PROJECT: SLIM (*Smart Living in Manufacturing*).
PERIOD: April 2023 - May 2023.

FUNDED BY: Lombardy Region
ROLE: Researcher
* RESEARCH PROJECT: SMART4CPPS (*Smart Solution for Cyber Physical Production Systems*).
PERIOD: February 2020 - July 2022.
FUNDED BY: Lombardy Region
ROLE: Researcher

– **Industrial research projects:**

- * Design a Machine Learning algorithm for load estimation in collaboration with *BFT Automation*.
- * Design a health monitoring and predictive maintenance system for CNC machinery in collaboration with *Mandelli Sistemi spa*.
- * Design a health monitoring and predictive maintenance system for industrial machinery in collaboration with *SMI spa*.
- * Design a digital twin and Hardware In the Loop system for a medical device in collaboration with *Delcon srl*.
- * Design a health monitoring and predictive maintenance system for electromechanical automation systems in collaboration with *BFT Automation*.
- * Design a controller aimed at maximising the efficiency of an electric car power system in collaboration with *Eldor Corporation*.
- * Design a thermal model to estimate the temperatures of some PCB components of an EMA from current and voltage measurements in collaboration with *BFT Automation*.
- * Design a fault diagnosis algorithm for a hydraulic engine in collaboration with *TESMEC spa*.
- * Design a measurement system aimed at health monitoring of a mould in collaboration with *Lovato Electric spa*.
- * Design a controller of a negative feeder mounted on a loom in collaboration with *LGL*.
- * Design an algorithm that minimises the dissipated power for Field Oriented Control in the field weakening region in collaboration with *Scaglia Indeva spa*.
- * Sensorless angular position estimation of a hybrid stepper motor using an Extended Kalman Filter in collaboration with *Camozzi spa*.
- * Design an algorithm that minimises the accelerometer temperature calibration in collaboration with *TSM Sensors*.

f) Organization, direction, and coordination of, or participation in, national and international research groups

Participation in the research group *Control and Automation Laboratory*.
PERIOD: October 2019 - Today.
AT: University of Bergamo.
MANAGER: Fabio Previdi.
ROLE: Researcher.

h) Participation in national and international congresses and conferences

– **Presentation at international conferences:**

- * 11th IFAC Symposium on Fault Detection, Supervision and Safety for Technical Processes (SAFEPROCESS), Pafos, Cyprus, 8-10 June 2022.
PAPER TITLE: Experimental fault detection of input gripping pliers in bottling plants [6].
- * 11th IFAC Symposium on Fault Detection, Supervision and Safety for Technical Processes (SAFEPROCESS), Pafos, Cyprus, 8-10 June 2022.
PAPER TITLE: Model-based fault diagnosis of sliding gates electro-mechanical actuators transmission components with motor-side measurements [7].

i) International awards and recognitions for research activities

- Finalist for the Best PhD Student Paper Award at the 11th IFAC Symposium on Fault Detection, Supervision and Safety for Technical Processes (SAFEPROCESS), with the paper [6].

Publications

Journal Paper

- [3] N. Valceschini, M. Mazzoleni, and F. Previdi. “Inertial load classification of low-cost electro-mechanical systems under dataset shift with fast end of line testing”. In: *Engineering Applications of Artificial Intelligence* 105 (2021), p. 104446. ISSN: 0952-1976. DOI: <https://doi.org/10.1016/j.engappai.2021.104446>.
- [4] N. Valceschini et al. “Data-driven mixed-sensitivity control with automated weighting functions selection”. In: *International Journal of Robust and Nonlinear Control* 33.6 (2023), pp. 3458–3470. DOI: <https://doi.org/10.1002/rnc.6579>.

Conference Paper

- [1] Davide Cesani et al. “Energy power grid three-phase signal estimation and fault detection for electric vehicles”. In: *2025 European Control Conference (ECC)*. 2025, pp. 1159–1165. DOI: [10.23919/ECC65951.2025.11187136](https://doi.org/10.23919/ECC65951.2025.11187136).
- [2] Davide Previtali et al. “Data-driven mixed-sensitivity structured control of SISO multi-model systems with application to a reconfigurable industrial oven”. In: *2025 European Control Conference (ECC)*. 2025, pp. 886–891. DOI: [10.23919/ECC65951.2025.11187191](https://doi.org/10.23919/ECC65951.2025.11187191).
- [5] D. Previtali et al. “Identification of dynamic textures using Dynamic Mode Decomposition”. In: vol. 53. 2. 21st IFAC World Congress. 2020, pp. 2423–2428. DOI: <https://doi.org/10.1016/j.ifacol.2020.12.045>.
- [6] N. Valceschini et al. “Experimental fault detection of input gripping pliers in bottling plants”. In: vol. 55. 6. 11th IFAC Symposium on Fault Detection, Supervision and Safety for Technical Processes SAFEPROCESS 2022. 2022, pp. 778–783. DOI: <https://doi.org/10.1016/j.ifacol.2022.07.221>.
- [7] N. Valceschini, M. Mazzoleni, and F. Previdi. “Model-based fault diagnosis of sliding gates electro-mechanical actuators transmission components with motor-side measurements”. In: vol. 55. 6. 11th IFAC Symposium on Fault Detection, Supervision and Safety for Technical Processes SAFEPROCESS 2022. 2022, pp. 784–789. DOI: <https://doi.org/10.1016/j.ifacol.2022.07.222>.
- [8] M. Mazzoleni, N. Valceschini, and F. Previdi. “Model uncertainty-aware residual generators for SISO LTI systems based on kernel identification and randomized approaches”. In: 62nd IEEE Conference on Decision and Control. 2023.

In compliance with the GDPR and the Italian Legislative Decree no. 196 dated 30/06/2003, I hereby authorize the recipient of this CV to use and process my personal details contained in this document.

UPDATED: 15 DECEMBER 2025

SIGN:

VALCESCHINI NICHOLAS