EUROPEAN CURRICULUM VITAE FORMAT

PERSONAL INFORMATION

Name	**FENIL PANALAL SHETHIA**
Address	[redacted]
Telephone	[redacted]
E-mail	[redacted]
Nationality	[redacted]
Date of birth	[redacted]

WORK EXPERIENCE

- March 2025 to June 2025 — **Internship**
  - Name and address of employer: Toyota Gazoo Racing Europe, Toyota Allee 7, 50858, Cologne, Germany
  - Title: Development and validation of machine learning-based models for the predictive estimation of knock intensity for varying engine designs and operating conditions
  - Main activities and responsibilities:
    - Development of a methodology to predict knock with existing data and extending the approach to capture the effects of different engine geometries and eventually different fuels
    - Developing models for virtual sensing of synthetic combustion indices
    - Data analysis of the experimental and simulated (from GT-Suite) data using AVL Concerto and Matlab/Simulink

- February 2024 — **Winner of the call for "Incarico per lavoro autonomo occasionale, Prot n. 0001037 del 05/03/2024"**
  - Name and address of employer: Department of Industrial Engineering, Alma Mater Studiorum – University of Bologna, Bologna Italy
  - Title: Sviluppo, validazione sperimentale e applicazione di modelli e sistemi di controllo motore innovativi basati sull'implementazione di algoritmi di Machine Learning
  - Duration: 150 hours
  - Main activities and responsibilities:
    - Cad design and implementation: Engine installation on bench, installation of the brake, sensor installation
    - Collection and data analysis of the data collected during the experimental tests
    - Identification of innovative procedures and indices to evaluate the accuracy and robustness of machine learning algorithms.
    - Simulation and experimental validation of the developed models and control algorithms developed

- May 2023 — **Winner of the call for "Incarico per lavoro autonomo occasionale, Prot n. 0001533 del 26/04/2023"**
  - Name and address of employer: Department of Industrial Engineering, Alma Mater Studiorum – University of Bologna, Bologna Italy
  - Title: Sviluppo ed implementazione di modelli e sistemi di controllo motore innovativi basati anche sull'utilizzo di Reti Neurali ed algoritmi di Machine Learning
  - Duration: 150 hours
  - Main activities and responsibilities:
    - Cad design of the components and engine test bench setup
    - Collection and data analysis from the experimental setup
    - Identification of innovative procedures to model various indices and evaluate the robustness and accuracy of the models.
    - Simulation and experimental validation of the developed models and codes

- May 2022 to October 2022 — **Winner of the scholarship (Borsa Di Formazione, Protocol Number 1168 of date 26/04/2022) for the topic: Models and control algorithms based on artificial intelligence and machine learning for the reduction of CO2 emissions in high-performance engines**

- Name and address of employer
- Main activities and responsibilities

Department of Industrial Engineering, Alma Mater Studiorum – University of Bologna, Bologna Italy

- Engine installation and conduction of test at the test bench
- Development of 0-D combustion models based on Artificial Intelligence
- Validation of models by comparing the results with experimental data
- Data analysis of the recorded data at the engine test cell using Matlab/Simulink

- October 2021 to April 2022
- Name and address of employer
- Main activities and responsibilities

Internship

Engine Test Cell, Department of Industrial Engineering, Alma Mater Studiorum – University of Bologna, Via Terracini, 40131, Bologna.

- Engine installation and conduction of test at the test bench
- Development of 0-D combustion models based on Artificial Neural Networks
- Developed a user-developed Matlab GUI to automatically train and test the Neural Networks
- Development of ANN-based, engine simulator
- Validation of the models and simulator by comparing the results with experimental data
- Data analysis of the recorded data at the engine test cell using Matlab/Simulink

- July 2015 to May 2019
- Name and address of employer
- Main activities and responsibilities

Design Engineer

Eros Elevators, 405 Bharat Industrial Estate, Sewri, Mumbai, 400015

- Modelling and FEA simulation of mechanical components
- 2D drawings for manufacturing

- September 2013 to July 2015
- Name and address of employer
- Main activities and responsibilities

Cadd Engineer

Cadd Center, A-306, Om Rachna, Sector-17, Vashi, Navi Mumbai, 400703

- Instructor on CAD software (Solidworks, Catia, Ansys, AutoCAD)
- 3D Modelling of components for outsourced projects

- July 2010 to September 2010
- Name and address of employer
- Main activities and responsibilities

Short Internship

Swastik Auto Works, S.K. Bole Road, Prabhadevi, Mumbai 400028

- Assisting in maintenance of passenger cars

- December 2009 to May 2010 & June 2008 to November 2008
- Name and address of employer
- Main activities and responsibilities

Internship (Sandwich Trainee)

TATA Motors Limited, Sector 15, MIDC, Pimpri Colony, Pimpri-Chinchwad, Pune, 411018

- Development of a function in a control system for automotive application
- Developing and simulating control circuits for automotive application in software environment
- Carried out mechanical assembly of a study 1.4L, inline 4-cylinder petrol engine

Tutorship

- Winner of the call "**Selezione per l'attribuzione di una attività di tutorato relativa all'insegnamento denominato POWERTRAIN TESTING, CALIBRATION AND HOMOLOGATION [cod. 86462] dell'Anno Accademico 2023/2024 per il corso ADVANCED AUTOMOTIVE ENGINEERING**".
  Duration: 30 hours, for the academic year 2023-2024
- Didactic Coordination of activities (about 164 hours):

- Powertrain Testing, Calibration and Homologation (86462).
  Duration: 64 hours, for the academic years 2022-23 and 2023-24.
- Modelling and Control of Internal Combustion Engines and Hybrid Propulsion Systems (86460).
  Duration: 64 hours, for the academic years 2022-23 and 2023-24.
- Laboratorio di Motori A Combustione Interna (73096).
  Duration: 6 hours, for the academic years 2022-23 and 2023-24
- Scuola internazionale di alta formazione MUNER in Automotive per una mobilità intelligente – Muner Higher Education School in automotive for intelligent mobility
  Duration: 30 hours, from November 2023 to December 2023

- Co-tutor for following master thesis activities (about 100 hours):
  - Title: PERFORMANCE ASSESSMENT OF RECURRENT NEURAL NETWORK-BASED ENGINE MODELS FOR THE PREDICTION OF COMBUSTION INDEXES UNDER TRANSIENT CONDITIONS, academic year 2022-2023, Author: Giovanni Busetti.
    Duration: 100 hours.
- Support for the exams for the following courses (about 96 hours):
  - Powertrain Testing, Calibration and Homologation (86462).
    Duration: 48 hours, for the academic years 2022-23 and 2023-24.
  - Modelling and Control of Internal Combustion Engines and Hybrid Propulsion Systems (86460).
    Duration: 48 hours, for the academic years 2022-23 and 2023-24.
- Part-time tutor at Alma Mater Studiorum – University of Bologna, supporting professors in the blended mode of teaching in March 2020 and March 2022
  Duration: 300 hours (150 hours in each year)

EDUCATION AND TRAINING

- November 2022 to Present
- Name of organization
- Topic
- Title of qualification

PhD course in Automotive Engineering for Intelligent Mobility, Curriculum 2: Energy Systems, Powertrains, Vehicle Performance
Alma Mater Studiorum - University of Bologna
Analysis and Advanced Modelling of Phenomenon and Technologies Related to the Implementation of New Propulsion Systems and Fuels to Reduce CO_2 Emissions
Doctor of Philosophy (PhD)

- September 2019 to April 2022
- Name of organization
- Thesis
- Title of qualification awarded

Master's Degree in Advanced Automotive Engineering – Advanced Powertrains, Bologna
Motorvehicle University of Emilia Romagna (MUNER)
Master Thesis Title: "Development and validation of an artificial intelligence-based, control-oriented simulator of a high-performance spark ignition engine".
Master's Degree in Advanced Automotive Engineering (Final Grade: 107/110)

- September 2010 to June 2013
- Name of organization
- Thesis
- Title of qualification awarded

Bachelor's Degree in Mechanical Engineering
K. J. Somaiya College of Engineering (Mumbai University)
Bachelor Thesis Title: "Study of design of airplane wings".
Bachelor of Engineering in Mechanical Engineering (Final Grade, 7th, and 8th Semester: 973/1500, First Class, 84.2/110 in Italian Grade)

- August 2006 to July 2010
- Name of organization
- Thesis
- Title of qualification awarded

Diploma in Mechanical Engineering
Agnel Polytechnic, Vashi (Maharashtra State Board of Technical Education)
Diploma Thesis Title: "Design and fabrication of windmill (microgeneration)".
Diploma in Mechanical Engineering (Final Grade, 7th, and 8th Semester: 875/1025, First (distinction) Class, 99.3/110 in Italian Grade)

Training and Seminars

- **Short course**, Alma Mater Studiorum - University of Bologna and KTH Engineering Mechanics, Topic: "Uncertainty Analysis for Engineers". By Prof. Henrik Alfredsson, Location: Online Lesson, Date: 13/02/2023 to 15/02/2023, Duration: 10 hours.

- **Short course @ Engine Test Cell**, Department of Industrial Engineering, Alma Mater Studiorum - University of Bologna, Topic: "An Overview of a Model-Based Combustion Control Algorithm and its implementation in a Rapid Control Prototyping System Designed for the Engine Test Bench". By Dott. Ing. Alessandro Brusa. Location: Engine Test Cell, Via Umberto Terracini 24/26, 40131, Bologna, Date: 15/12/2022 & 21/12/2022, Duration: 8 hours.
- **Short course**, Alma Mater Studiorum - University of Bologna and KTH Mekanik, Topic: "Short Course on Data Driven Methods in Engineering (Part 2)". By Prof. Ricardo Vinuesa, Location: Online Lesson, Date: 29/11/2022 to 12/12/2022, Duration: 12 hours.
- **Muner Winter School**, MUNER Higher Education, Topic: "Future of Automotive for Intelligent Mobility", Location: Online School, Date: 17/11/2022 to 07/12/2022, Duration: 90 hours.
- **Online Training**, Gamma Technologies, Topic: "GT-Suite Introduction Training", Location: Online, Date: 06/12/2021 to 07/12/2021, Duration: 9 hours.
- **Online Training**, Gamma Technologies, Topic: "GT-Suite Exhaust Aftertreatment Training", Location: Online, Date: 09/12/2021 to 10/12/2021, Duration: 16 hours.
- **Safety Training**, Alma Mater Studiorum - University of Bologna, Topic: "Module 1: Safety General Training", Location: Online, Date: 20/11/2020, Duration: 4 hours.
- **Safety Training**, Alma Mater Studiorum - University of Bologna, Topic: "Module 2: Safety Specific Training (Part 1)", Location: Online, Date: 20/11/2020, Duration: 4 hours.

EXTRA-CURRICULAR ACTIVITIES

- February 2020 to Present
- Name of organization
- Main activities

Powertrain Engineer

Unibo Motorsports Formula SAE Combustion Team, Bologna, Italy
- Energy consumption analysis for a preliminary concept of hybrid powertrain
- Developed a model for fuel film compensation using Matlab/Simulink
- Data analysis & Technician

- January 2015 to January 2019
- Name of organization
- Main activities

Technical Inspector

Formula Bharat (Indian Formula SAE Race), India
- Technical Inspector & Document Reviewer

- August 2011 to August 2013
- Name of organization
- Main activities

Powertrain Manager and Team Member

Orion Racing India, Formula SAE Combustion Team, Mumbai, India
- Engine calibration using Motec M400 ECU
- Data analysis & Technician

PUBLICATIONS

- Description

Author and Presenter at international conferences, for the following papers:

- Journal Papers
  - Brusa A, Grossi A, Lenzi M, Shethia FP, Cavina N, Kitsopanidis I. Modeling of Exhaust Gas Temperature at the Turbine Outlet Using Neural Networks and a Physical Expansion Model. *Energies*. 2025; 18(7):1721. https://doi.org/10.3390/en18071721
  - Brusa A, Shethia FP, Petrone B, Cavina N, Moro D, Galasso G, Kitsopanidis I. The Enhancement of Machine Learning-Based Engine Models Through the Integration of Analytical Functions. *Energies*. 2024; 17(21):5398. https://doi.org/10.3390/en17215398
  - Brusa, A., Shethia, F., Mecagni, J., and Cavina, N., "Advanced, Guided Procedure for the Calibration and Generalization of Neural Network-Based Models of Combustion and Knock Indexes," *SAE Int. J. Engines* 17(2):2024, https://doi.org/10.4271/03-17-02-0009

- Brusa, A., Mecagni, J., Shethia, F., and Corti, E., "Model-Based Combustion Control to Reduce the Brake Specific Fuel Consumption and Pollutant Emissions under Real Driving Maneuvers," *SAE Int. J. Engines* 17(1):2024, https://doi.org/10.4271/03-17-01-0007

- Technical Papers
  - Shethia, F., Mecagni, J., Brusa, A., Cavina, N. et al., "Performance Assessment of a Model-Based Combustion Control System to Decrease the Brake Specific Fuel Consumption," SAE Technical Paper 2023-24-0027, 2023, https://doi.org/10.4271/2023-24-0027
  - Shethia, F., P., Mecagni, J., Brusa, A., Cavina, N., "Development and Software-in-the-Loop Validation of an Artificial Neural Network-Based Engine Simulator", SAE Technical Paper 2022-24-0029, 2022, https://doi.org/10.4271/2022-24-0029 at SAE International CSM 2022: 22CSM-0036.

Participation and Presentation at International Conference

- ICE2023, 16th International Conference on Engines and Vehicles for Sustainable Transport, Capri, Napels, Italy, September 2023.
  Presented the paper titled "Performance Assessment of a Model-Based Combustion Control System to Decrease the Brake Specific Fuel Consumption".
- CSM2022, 3rd Conference on Sustainable Mobility, Catania, Italy, Spemtember 2022

MOTHER TONGUE

Gujarati

OTHER LANGUAGES

English

- Reading skills: Proficient (C1)
- Writing skills: Proficient (C1)
- Reading skills: Proficient (C1)

Italian

- Reading skills: Advanced Beginner (A2.2)
- Writing skills: Advanced Beginner (A2.2)
- Reading skills: Advanced Beginner (A2.2)

Marathi

- Reading skills: Proficient
- Writing skills: Competent
- Reading skills: Proficient

Hindi

- Reading skills: Proficient
- Writing skills: Competent
- Reading skills: Proficient

TECHNICAL SKILLS AND COMPETENCES

- Computer Skills

Applications

- Matlab/Simulink → Expert
- OBI Indicating System → Advance Beginner
- OBI Indicating System → Advance Beginner
- AVL Concerto → Beginner
- GT Power → Advance Beginner
- INCA → Proficient
- Solidworks → Expert
- PTC Creo → Proficient
- NX Cad → Proficient

- Catia → Proficient
- Ansys → Proficient
- AutoCAD → Proficient
- Mircosoft Office → Proficient

OTHER SKILLS AND COMPETENCIES

- Cycling
- Basketball
- Reading

REFERENCE

- Name and title: Vinay Parab, P. Eng., MSc Mechanical Engineer
- E-mail: vparabmech@gmail.com
- Telephone: +1 306 530 5119

BOLOGNA, 28/06/2025

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Fenil Panalal Shethia

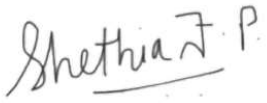
SUBSTITUTIVE DECLARATIONS OF CERTIFICATIONS
(Art. 46 D.P.R. n. 445/00)

SUBSTITUTIVE DECLARATIONS OF THE DEED OF NOTORIETY
(Art. 47 D.P.R. n. 445/00)

The undersigned Fenil Panalal Shethia, C.F. SHTFLP90M31Z222G, born in Mumbai, India on 31/08/1990 and residing in Via Della Pietra, Bologna, male, for this purpose and aware of criminal sanctions, in the case of untruthful declarations, training or use of false acts, referred to in art. 76 of D.P.R. 445 of 28 December 2000

STATES

that the personal data, statuses, personal qualities, information and titles contained and detailed in this Curriculum correspond to the truth and to be in possession of all the titles reported in it.



Bologna, 28 June 2025 Fenil Panalal Shethia

This declaration does not require signature authentication if, pursuant to art. 38, D.P.R. 445/00, is signed and sent together with the photocopy, not authenticated of an identity document of the declarant, to the competent office.