Curriculum Vitae

Max Mauro Dias Santos
Associate Professor & Department Chair
Federal Technological University of Paraná – Ponta Grossa
Paraná – Brazil

2025

EXECUTIVE PROFILE – CANADA IMPACT+ RESEARCH CHAIR

Max Mauro Dias Santos
Associate Professor & Department Chair
Federal Technological University of Paraná – Ponta Grossa (UTFPR-PG), Brazil
Leader, Automotive Systems Group (GSA)
Founder, Real-Time Systems Laboratory (LTR)
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A. Impact Summary

- **Delivered over 29 years of sustained impact** in electrified and autonomous systems, embedded intelligence, energy-aware control, and automotive cybersecurity, contributing deployable technologies that advance clean mobility, intelligent transportation systems, and safety-critical cyber-physical platforms.
- **Secured and managed USD 4.3+ million in competitive funding** from government and industry, supporting large-scale applied research programs, joint laboratories, advanced testbeds, and long-term technology transfer in collaboration with global OEMs and Tier-1 suppliers.
- **Delivered deployable engineering solutions adopted in OEM and Tier-1 automotive workflows**, reducing calibration effort, improving ADAS validation reliability, strengthening cybersecurity of EV charging infrastructure, and accelerating deployment of AI-enabled vehicle functions through model-based design.
- **Established and scaled internationally recognized research hubs (GSA and LTR)** that integrate system engineering, embedded software, AI, validation, and industrial standards, serving as reference centers for intelligent mobility and safety-critical systems.
- **Trained and mentored hundreds of highly qualified personnel**, including undergraduate and graduate students, postdoctoral researchers, and more than 2,000 industry engineers, directly strengthening workforce capacity in electrified mobility, ADAS, embedded AI, and automotive cybersecurity.
- **Produced a sustained body of high-impact scholarly and translational output**, including peer-reviewed journal articles, patents, technical standards contributions, and industrial reports that bridge foundational research and real-world deployment.
- **Demonstrated readiness to establish and scale a Canada-based, globally connected research hub**, leveraging prior experience building internationally visible laboratories (GSA, LTR), leading multi-million-dollar programs, and partnering with industry, utilities, and public agencies—directly aligned with the goals of the Impact+ program.

B. Leadership, Governance, and Knowledge Translation Highlights

- **Currently Associate Professor and Department Chair at UTFPR**, with full responsibility for academic leadership, budget authority, infrastructure planning, and multi-stakeholder governance across a unit comprising 28 faculty members, 2 staff, 22 laboratories, three undergraduate programs, one Master's program, and ~600 students.
- **Founded and directed the Automotive Systems Group (GSA) and the Real-Time Systems Laboratory (LTR)**, with responsibility for strategic research planning, infrastructure investment, budget allocation, team growth, and multi-institutional governance involving universities, industry partners, and funding agencies.
- **Led long-term, multi-year R&D collaborations with global OEMs and Tier-1 suppliers** (Stellantis, Renault, Volvo, DAF Trucks, Vector Informatik, and others), ensuring structured translation of research outcomes into certified industrial workflows and deployable technologies.
- **Designed and delivered large-scale professional education and continuing training programs** for the automotive sector, covering ADAS, electrification, embedded AI, cybersecurity, automotive networks, and model-based design—supporting rapid industry upskilling and technology adoption.

- **Demonstrated sustained excellence in academic governance and program sustainability**, including faculty mentoring, curriculum modernization, laboratory expansion, and long-term strategic planning aligned with emerging societal, industrial, and regulatory demands.

C. Scientific and Scholarly Contributions with Societal Impact

- **Electrical and Embedded Foundations of Electrified Autonomous Systems**: Advanced the electrical and embedded engineering foundations of electrified and autonomous mobility, including power electronic architectures, energy-aware control, intelligent sensing, and grid-connected vehicle systems. These contributions directly support clean transportation, energy efficiency, and decarbonization objectives.
- **Automotive Systems Engineering, Methods, Processes, and Standards**: Pioneered system-engineering-driven approaches integrating requirements engineering, model-based design (MBD), SIL/HIL validation, and certification-aware development aligned with ISO 26262, ISO 21434, ASPICE, and emerging autonomous-vehicle standards—reducing development time, calibration effort, and lifecycle cost.
- **AI-Enabled ADAS and Energy-Aware Autonomy**: Developed AI-enabled solutions for ADAS, fuel estimation, energy management, perception validation, and fault detection, emphasizing explainability, robustness, and real-time feasibility—bridging the gap between academic AI models and production-ready automotive systems.
- **Cybersecurity and Resilience of CASE Systems**: Contributed to the cybersecurity, resilience, and fault tolerance of connected, autonomous, shared, and electrified (CASE) systems, including secure in-vehicle networks, EV charging infrastructure protection, and attack-aware architectures relevant to public safety and critical infrastructure.
- **Workforce Development and Professional Training Impact**: Delivered extensive professional training and continuing education programs for the automotive industry—covering embedded software, networks (CAN, LIN, FlexRay, Ethernet), ADAS, electrification, AI, cybersecurity, and validation tools—directly strengthening industrial capability and innovation readiness.

D. Alignment with Federal Strategic Priorities and Research Plan

- My research vision aligns directly with the **Canada Impact+ Research Chair in Electrified Autonomous Systems**, with the goal of establishing a **nationally and internationally visible research hub at the University of Toronto** focused on the electrical, embedded, and cyber-physical foundations of **electrified, autonomous, and grid-connected systems**.
- The overarching objective is to **position Canada as a global leader in energy-aware autonomous mobility**, while strengthening domestic innovation capacity, industrial competitiveness, and the training of highly qualified personnel.

Advanced Digital Technologies (Artificial Intelligence and Cybersecurity)

- Advance **AI-driven embedded intelligence** for safety- and mission-critical autonomous systems, emphasizing **explainable, robust, and certifiable machine learning** suitable for real-time deployment.
- Develop AI methods for **perception validation, energy-aware decision-making, fault detection, and system supervision**, alongside **cybersecure architectures** for connected and autonomous platforms.
- Establish dedicated infrastructure including **embedded AI testbeds, hardware-in-the-loop (HIL) platforms, automotive-grade computing, and cyber-physical attack–defense laboratories**, supporting both civilian and dual-use applications.

Clean Technology and Resource Value Chains

- Lead research in **electrified mobility and energy-constrained autonomy**, encompassing electric vehicles, intelligent charging systems, and vehicle–grid interaction.
- Develop **energy-aware control and optimization frameworks** coupling sensing, decision-making, and actuation with real-time energy and grid conditions.

- Deploy infrastructure such as **EV powertrain benches, bidirectional charging systems, power electronics test platforms, and grid-connected simulators**, directly supporting Canada's decarbonization goals and clean technology value chains.

Manufacturing and Advanced Systems

- Integrate **digital twins, model-based design (MBD), and real-time validation** to transform how complex autonomous and electrified systems are engineered, certified, and commercialized.
- Combine **simulation, SIL/HIL testing, and data-driven adaptation** to reduce development cycles, calibration effort, and lifecycle costs.
- Invest in **scalable simulation environments, real-time prototyping platforms, and advanced validation toolchains** to accelerate industrial innovation while meeting safety and regulatory requirements.

Defence and Dual-Use Technologies

- Extend research outcomes to **dual-use autonomous systems**, emphasizing **resilience, fault tolerance, cybersecurity, and explainability**.
- Apply secure and energy-aware autonomous architectures to civilian transportation, critical infrastructure protection, and safety-sensitive defence contexts, enhancing Canada's technological sovereignty.

Team Building, Translation, and Impact

- Build **interdisciplinary research teams** including graduate students, postdoctoral fellows, research engineers, and industry-embedded trainees.
- Leverage established **international partnerships** to attract global talent and form strategic collaborations with **Canadian industry, utilities, and public agencies**.
- Ensure strong pathways to **knowledge translation, commercialization, and policy impact**.
- As an internationally based researcher with a proven record of leadership, large-scale funding, and industrial engagement, I am fully committed to using the Impact+ platform to **elevate the University of Toronto as a national anchor in electrified autonomous systems research**, delivering **tangible social, economic, and environmental benefits** for Canada.

Selected Impact Metrics (Canada Impact+ Focus)

Research Scale, Leadership, and Funding

- **USD 4.3+ million** in competitively awarded external funding secured and managed as Principal Investigator or Co-Principal Investigator, across public agencies and industry-sponsored programs.
- Leadership of **large, multi-institutional research initiatives** involving up to **five universities** and **more than ten industrial partners**, integrating academia, OEMs, Tier-1 suppliers, and technology providers.
- Direct responsibility for **projects exceeding USD 2.5 million**, including strategic research planning, budget authority, infrastructure investment, and delivery of scientific and industrial milestones.
- Proven experience managing **large interdisciplinary teams (18–40 researchers)** comprising faculty, postdoctoral fellows, graduate students, research engineers, and industry-embedded personnel.

Highly Qualified Personnel (HQP) Training and Workforce Development

- Supervision and co-supervision of **22+ graduate students (MSc and PhD)** in electrical engineering, embedded systems, autonomous systems, and cybersecurity.
- Mentorship of **50+ undergraduate capstone projects**, many conducted in direct collaboration with industry and addressing real-world engineering challenges.
- Design and delivery of **400+ professional, executive, and specialization-level training courses**, directly upskilling **2,000+ engineers and technical leaders** from OEMs, Tier-1 suppliers, utilities, and public institutions.
- Sustained contributions to workforce readiness in **automotive embedded systems, electrification, ADAS, AI-enabled systems, cybersecurity, and intelligent transportation**, strengthening national innovation capacity.

Industry Engagement, Knowledge Translation, and Societal Impact

- Long-term R&D collaborations with global industrial partners including **Stellantis, Bosch, Renault, Volvo, DAF Trucks, Intelbras, Vector Informatik and others**.
- Delivery of **deployable engineering solutions** adopted in **certified automotive development and validation workflows**, reducing calibration effort, improving system reliability, and accelerating deployment of ADAS and AD features.
- Strong record of **knowledge translation and technology transfer**, including joint laboratories, applied research programs, professional training initiatives, and patentable innovations.
- Experience operating at the interface of **research, product development, and regulation**, ensuring scientific advances translate into economic, environmental, and societal benefits.

Scholarly and Technical Contributions

- Author or co-author of **63 peer-reviewed journal articles**, **81 refereed conference papers**, **7 books or book chapters**, and **5 patents**.
- Contributions spanning **automotive embedded systems, electrified and autonomous vehicles, model-based design, AI-enabled control, cybersecurity, and intelligent transportation systems**.
- Research outcomes influencing **engineering tools, validation methodologies, and standards-aware design practices** in safety-critical automotive and cyber-physical systems.

Canada Impact+ Readiness

- Demonstrated ability to establish and scale internationally visible research programs through founding.
- Proven readiness to build a Canada-based, globally connected research hub via strong international partnerships, industry integration, and sustained program leadership.
- Strong foundation to advance the Impact+ mandate by delivering research excellence, training highly qualified personnel, accelerating commercialization, and positioning Canada and the University of Toronto as leaders in electrified autonomous systems.

1. Introduction

Name	Max Mauro Dias Santos
Present Appointment	Associate Professor & Department Chair Department of Electronics Federal Technological University of Paraná – Ponta Grossa Rua Dr. Washington Subtil Chueire, nº 330, Jardim Carvalho Ponta Grossa, Paraná, Brazil, 84017-220

2. Education

11/2005 - 03/2006 — **Postdoctoral Fellow**
University: Department of Electrical Engineering, University of Aveiro (UA), Portugal.
Research Area: Distributed Control Systems
Supervisor: Luis Almeida (UA)

03/2001 - 10/2004 — **Ph.D. in Industrial Engineering**
University: Federal University of Santa Catarina (UFSC), Brazil
Thesis: Design Methodologies for Networked Control Systems
Research Area: Networked Control Systems
Supervisor: Marcelo Stemmer (UFSC) and Francisco Vasques (FE/UP)

03/1994 - 09/1996 — **M.Sc. in Electrical Engineering**
University: Federal University of Santa Catarina (UFSC), Brazil
Dissertation: Constraints Regulation with Polo Allocation: Approach with Positive Invariance and Linear Programming
Research Area: Digital Control Systems
Supervisor: Eugenio Castelan Neto (UFSC)

02/1988 - 12/1993 — **B.E. in Electrical Engineering**
University: Catholic Institute of Minas Gerais (ICMG), Brazil
Dissertation: Analysis of Maintenance of Steel Works Area in Siderurgic Industry (Usiminas)
Research Area: Industrial Control Systems
Supervisor: Flávio (ICMG)

3. Resume

Dr. Max Mauro Dias Santos is a senior academic leader and industry expert with over 29 years of experience spanning electrical engineering, industrial automation, and automotive and intelligent transportation systems. He holds a B.Sc. in Electrical Engineering from the Catholic Institute of Minas Gerais (1993), an M.Sc. in Electrical Engineering (1996), and a Ph.D. in Industrial Engineering (2004) from the Federal University of Santa Catarina, Brazil. Since 2012, he has been an Associate Professor at the Federal Technological University of Paraná – Ponta Grossa (UTFPR-PG), where he currently serves as Department Chair of Electronics and Director of the Automotive Systems Group (GSA).

Dr. Dias Santos has secured and managed more than USD 4.3 million in competitive research funding from government and industry programs, including major initiatives such as SEGCOM and SegurAuto (Rota 2030/FUNDEP) and VirtuAuto (FINEP 2030). His research has been conducted in close collaboration with leading industrial partners including Renault, Volvo, Stellantis, DAF Trucks, Vector Informatik, AVL, and Bosch, focusing on automotive safety, cybersecurity, electrified

and autonomous systems, and intelligent transportation technologies. Prior to his academic career, he gained extensive industrial experience at multinational companies such as IBM, Volvo, and General Motors, contributing to the development of large-scale, safety-critical engineering systems.

Scholarly Experience

Since 2012, Dr. DIAS SANTOS has been an Associate Professor at the Federal Technological University of Paraná – Ponta Grossa (UTFPR-PG), where he also serves as the Department Chair of Electronics and the Director of the GSA Lab (Group of Automotive Systems). He has made significant contributions to research in the fields of autonomous driving, electric vehicles, automotive cybersecurity, and advanced vehicle control systems.

Dr. DIAS SANTOS has held various prestigious international roles, including:

- **Visiting Professor** in The Edward S. Rogers Sr. Department of Electrical and Computer Engineering at the University of Toronto, Canada (2023-2024)
- **Visiting Researcher** in IRRCyN at the University of Nantes, France (2008)
- **Postdoctoral Fellow** in the Department of Electronics, Telecommunications, and Informatics at the University of Aveiro, Portugal (2005-2006)
- **Visiting Scholar** in the Department of Mechanical Engineering at the University of Porto, Portugal (2003)
- **Director** of the Real Time System Laboratory (LTR) – R&D Lab at UnilesteMG (2002-2009)
- **Director** of the Automotive System Group (GSA) – R&D Lab at UTFPR-PG (2005-current)

Industry Experience

Dr. DIAS SANTOS brings a strong industry background with hands-on experience in major global companies. His professional career includes:

- **Senior Product Engineer** at General Motors (2010-2012), where he specialized in electrical, control, software, and infotainment systems
- **Senior Product Engineer** at Volvo (2009-2010), focusing on powertrain control systems
- **Automation Engineer** at IBM and IBM-US (1997-1999), where he worked with the IBM RS/6000 SP2 (Deep Blue) on power system

Research Leadership

As a Principal Investigator (PI) and Co-PI, Dr. DIAS SANTOS has led numerous engineering and technology projects related to the next generation of vehicular system. His research focuses on:

- **Driving Assistance, Autonomous Driving, and Electrification**: Development of solutions for ADAS, autonomous vehicle technologies, and electric powertrains
- **Embedded Systems and Automotive Software**: Integration of high-performance embedded systems and software-defined vehicle architectures
- **Cyber-Physical Security**: Cybersecurity measures for connected, autonomous, shared, and electrified (CASE) vehicle platforms
- **Artificial Intelligence and Computer Vision**: Applying AI for perception and decision-making in autonomous vehicles
- **Data Acquisition, Modeling, Simulation, and Virtualization**: Techniques for the development and validation of automotive technologies

- **Communication and Control Strategies**: V2X (vehicle-to-everything) communication protocols and control systems optimization

Teaching and Course Development

Dr. DIAS SANTOS has developed and delivered advanced courses covering:

- Embedded Systems
- Automotive Embedded System
- ADAS and Autonomous Systems
- Intelligent Transportation System
- Vehicular Electrification
- Smart Systems and Cybersecurity
- Industry 4.0 and Automation
- Communication Technologies
- Intelligent Systems
- Co-design of HW&SW

His teaching approach integrates practical industry standards, processes, and tools to equip students with the skills needed for cutting-edge technology sectors.

Fields of Expertise

- Control and Embedded Systems
- Cyber-Physical Systems
- Cybersecurity
- Electrified and Autonomous Vehicles
- Automotive Software and Industry 4.0
- Vehicular Electrification

Dr. DIAS SANTOS's rich blend of academic leadership, practical industry experience, and active research in future-oriented technologies make him an ideal candidate for faculty positions in North American universities, particularly in electrical engineering, automotive systems, and cybersecurity domains.

Additional Information

- **US Visa B1/B2**: Valid from 09/2018 to 09/2028
- **Canada Visa V1**: Valid from 02/2017 to 03/2026
- **Canada Visa W1**: Valid from 07/2023 to 02/2024

4. Employment Timeline

Current Appointment

06/2024 - Current **Department Chair**
Department of Electronics
Federal Technological University of Paraná – Ponta Grossa (UTFPR-PG)
Ponta Grossa, Paraná, Brazil

12/2020 - Current **Associate Professor**
Department of Electronics
Federal Technological University of Paraná – Ponta Grossa (UTFPR-PG)
Ponta Grossa, Paraná, Brazil

Previous Appointment

Full-time Positions

07/2023 – 02/2024 **Visiting Professor**
The Edward S. Rogers Sr. Department of Electrical & Computer Engineering
University of Toronto
Toronto, Ontario, Canada

12/2012 - 11/2020 **Assistant Professor**
Department of Electronics
Federal Technological University of Paraná – Ponta Grossa (UTFPR-PG)
Ponta Grossa, Paraná, Brazil.

11/2010 - 02/2012 **Senior Product Development Engineer**
Electrical, Control, Software, and Infotainment
General Motors Tech Center (GM)
São Caetano do Sul, São Paulo, Brazil.

07/2009 - 10/2010 **Senior Product Development Engineer**
Powertrain Control Systems
Volvo do Brazil (Volvo)
Curitiba, Paraná, Brazil.

02/1998 - 07/2009 **Associate Professor (tenure-track)**
Department of Electrical and Computer Engineering
Centro Universitário do Leste de Minas Gerais (UnilesteMG)
Coronel Fabriciano, Minas Gerais, Brazil.

08/2001 - 12/2002 **Lecturer (tenure-track)**
Department of Computer Science
Universidade do Planalto Catarinense (UNIPLAC)
Lages, Santa Catarina, Brazil.

08/2000 - 02/2002 **Lecturer (tenure-track)**
Department of Computer Science

Universidade do Vale do Itajaí (UNIVALI)
Florianópolis, Santa Catarina, Brazil.

03/1998 - 06/2000 **Lecturer (tenure-track)**
Department of Computer Science
Universidade do Vale do Rio Doce (UNIVALE)
Governador Valadares, Belo Horizonte, Brazil.

01/1997 - 03/1999 **Automation Engineer**
Project Manager
IBM Global Services
Timóteo, Minas Gerais, Brazil.

02/1992 - 07/1992 **Electrical Engineering Intern**
Steelworks I
USIMINAS
Ipatinga, Minas Gerais, Brazil.

071991 - 07/1991 **Electrical Engineering Intern**
Steelworks II
USIMINAS
Ipatinga, Minas Gerais, Brazil

Visiting Positions

02/2008 - 03/2008 **Visiting Researcher**
Research in Automotive System
Institut de Recherche en Communications et Cybernétique de Nantes (IRCCyN) – Nantes, France.

01/2003 - 02/2003 **Visiting Researcher**
Department of Mechanical Engineering
Faculty of Engineering at University of Porto (UP) – Porto, Portugal.

06/2000 - 10/2004 **Visiting Researcher**
Graduate Student at the Graduate Program of Industrial Engineering - Florianópolis, Federal University of Santa Catarina (UFSC), Santa Catarina, Brazil.

05/1997 - 06/1997 **Resident Engineer**
Utilities Automation for Stainless Company
IBM Houston – Houston, Texas, United States.

03/1994 - 09/1996 **Master Researcher**
Department of Systems Automation
Federal University of Santa Catarina (UFSC) – Florianópolis, Santa Catarina, Brazil.

5. Teaching

12/2012 – Current UTFPR-PG: Industrial Instrumentation (UG-GS), Embedded Systems (GS), Digital Signal Processing (GS), Automotive Software Engineering (UG-GS), Electrical Measurement (UG).

07/2023 – 02/2024	University of Toronto: ECE1508H - Cybersecurity for Connected, Autonomous, Shared and Electric Vehicles (GS).
02/1999 – 07/2009	UnilesteMG: Project Management (UG), Management of Technological Innovation (UG), Computer Networks (UG), Real-Time Systems (UG), Computer Architecture (UG), Industrial Local Networks (UG), Linear Algebra (UG).
03/2008 – 04/2008	Ecole Centrale de Nantes: Technologies of Communication Networks for Automotive Systems (UG).
02/2005 – 07/2005	FIC: Distributed Systems (GS), Analysis and Modeling of System Performance (GS).
08/2001 – 12/2002	UNIPLAC: Process Control (UG), Modeling and Simulation of Systems (UG), Client and Server Programming through TCP/IP (UG).
08/2000 – 12/2001	UNIVALI: Computer Architecture (UG), Uncertainty Modeling (UG).
03/1998 – 06/2000	UNIVALE: Computer Networks (UG), Operating Systems (UG), Theory of Computation (UG), Software Engineering (UG).
08/1998 – 07/2000	ICMG: Operational Research (UG), Digital Signal Processing (UG), Modern Control (UG), Linear Systems (UG).

UG – Undergraduate Course - bachelor's in electrical engineering and computer science

PG – Graduate Course - master's in electrical engineering and computer science

6. Consulting & Training

Dr. Dias Santos has an extensive and sustained record of professional training and industrial consulting, with over **27 years of experience** delivering **more than 400 specialized and executive-level courses** in automotive, industrial, and embedded systems engineering. Since 1997, his training activities have directly upskilled **over 2,000 engineers, technical leaders, and managers**, bridging advanced academic knowledge with deployable industrial practice. His courses span automotive embedded systems, CAN/J1939 and in-vehicle networks, diagnostics, powertrain control, electrified and autonomous vehicles, software engineering, model-based design, and hardware-in-the-loop validation.

These programs have been delivered in close collaboration with leading **OEMs, Tier-1 suppliers, utilities, and professional associations**, including **Stellantis, Ford, Bosch, Volvo, Renault, DAF, PTC Academy, dSPACE, SAE Brazil, AEA (Brazilian Automotive Engineering Association), ITAIPU Binational, USIMINAS, Marcopolo, Chiptronic, AUTOTRAC**, and multiple federal universities. Notably, his long-standing engagement with AEA alone includes **over 50 courses** reaching engineers from major automotive manufacturers and suppliers. This sustained training activity has played a significant role in strengthening workforce readiness, accelerating technology adoption, and enhancing national capacity in automotive embedded systems, electrified mobility, and intelligent transportation—demonstrating a rare and impactful integration of education, industry needs, and technological innovation.

7. Courses & Talks

Dr. Dias Santos has continuously invested in advanced professional development across industry and academia to remain aligned with state-of-the-art and emerging technologies in automotive, embedded, and cyber-physical systems. His recent training includes high-level seminars and tutorials on **large language models for autonomous vehicle data interpretation** and **cybersecurity for intelligent transportation systems**, delivered at international venues such as **Toronto Metropolitan University** and **IEEE ISIE (Toronto, 2025)**. These activities reflect his active engagement with cutting-edge AI, autonomy, and security research communities.

Complementing this, he has completed extensive hands-on technical training with leading industrial technology providers and professional associations, notably **Vector Informatik** and the **Brazilian Association of Automotive Engineering (AEA)**, covering **CAN/J1939 networks, ECU testing and calibration, ADAS development, model-based design, engine calibration, hybrid and electric vehicle homologation, battery and BMS systems, and autonomous vehicle software**. Earlier professional development includes advanced programs at **Volvo**, **WEG**, **INEP/MEC**, and major national engineering conferences, spanning **industrial automation, control systems, high-speed networks, cybersecurity, and instrumentation**. This long-term and systematic upskilling—spanning more than three decades—has ensured strong technical currency, practical relevance, and the ability to translate emerging technologies into both research leadership and high-impact industrial training.

8. Research Funding

12/2025 – Current	(=US$ 7.35M) – CIC-SSV - Integrated Center of Expertise in Vehicle Security Systems (1 project) – Poli/USP, USP-SC, UnB Gama, UFSC, UTFPR-PG and UFPE – Funded by FUNDEP/Mover – Under Review
10/2023 – Current	(=US$ 1.76M) - SEGCOM - Design, implementation and testing of components and devices for the development of driving assistance systems (1 project – 13 PhD, 15 MSc, and 21 UG) – Poli/USP, USP-SC, UnB Gama, UTFPR-PG and UFPE – Funded by FUNDEP/Rota2030 – ONGOING
05/2022 - Current	(=US$ 778.36K) - VirtuAuto - Development of Autonomous Vehicle Architecture (ADAS) through Computer Vision Using Vehicle Dynamics Simulator (1 project - 4 MSc) - PUC Minas, Stellantis and UTFPR-PG – Funded by FINEP2030 - ONGOING
02/2021 – 08/2024	(=US$ 687.86K) - SegurAuto - Design and Integrated Development of Driver Assisted Safety Function and Environment for Autonomous Vehicles (1 project - 6 MSc and 6 UG) – Poli/USP, USP-SC, UnB Gama, UTFPR-PG and UFPE – Funded by FUNDEP/Rota2030
05/2022 – 04/2023	(=US$ 6.83 K) - FA/Bosch - BSS Project - Digital Twin and Engine Test Bench Connectivity (2 projects - UG) - Funded by Bosch & Fundação Araucária
12/2022 - 08/2023	(=US$ 10.03 K) - TERMILOG - Object Recognition in Logistic Terminal Systems - (1 Project - UG and MSc) - Funded by KMM Soluções Tecnológicas S.A.
06/2021 - 08/2023	(=US$ 25.5K) - FA/Renault - Engine Calibration through Neural Networks, Technological Evolution of Spark Ignition Engine, Connective and Data Science for Connected Vehicles (4 projects - MSc) - Funded by Renault & Fundação Araucária.
04/2021 - 12/2022	(=US$ 6.6K) - FA/Volvo - Optimization of Complete Vehicle Protection Strategies (1 project - MSc) - Funded by Volvo & Fundação Araucária

04/2021 - 10/2021 (=US$ 1.6K) - DiagAuto-II – Models for Diagnostics in Automotive Embedded Systems (1 project - UG) - Funded by Chiptronic

07/2018 - 11/2020 (=US$ 24.0K) - FA/Renault - Spark Ignition Engine, Auto Parking Assist, Infotainment and Industry 4.0 (4 projects - 2 MSc and 2 UG) - Funded by Renault & Fundação Araucária

07/2017 - 06/2019 (=US$ 23.8K) - FA/Renault - Numerical Simulation of Spark Ignition Engine (1 project - 1 MSc and 1 UG) - Funded by Renault & Fundação Araucária.

07/2017 - 06/2019 (=US$ 24.1K) - SOFTCAR - Research and Development of Methods, Processes and Tools for Model Based Automotive Software Engineering - Funded by CNPq

11/2015 - 06/2018 (=US$ 510.7K) - FLC - Front View Camera for Advanced Driver Assistance Systems (ADAS) - Funded by FIAT CHRYSLER AUTOMOBILES

11/2015 - 10/2017 (=US$ 8.7K) - MERFESA - Methods, Processes and Tools for Automotive Embedded Systems (Mathworks and CRADLE) - Funded by OpenCadd

08/2016 - 07/2017 (=US$ 3.3K) - DiagAuto-I – Model Based Diagnostic in Automotive Embedded Systems - Funded by Chiptronic

07/2007 - 06/2009 (=US$ 14.6K) - Flex-by-Wire - An Architecture for Flexible Integration of Subsystems with X-by-Wire Technology - Funded by FAPEMIG

07/2007 - 06/2009 (US$ 8.2K) - SisAuto - Development and Monitoring Systems in Real-Time for Automotive Networks - Funded by FAPEMIG

11/2005 - 10/2006 h-BEB - Project between FEUP and LTR/UnilesteMG Experimental Implementation of h-BEB (High Priority Binary Exponential Backoff) protocol in Ethernet board

03/2003 - 02/2004 RTAI-Linux - Project between University of Nantes and LTR/UnilesteMG that was development computer tools for performance evaluation of RTAI-Linux

9. Publications

Publications		
	Named	**Amount**
Journal	J	63
Conference	C	81
Books	B	7
Patent	P	5

Journal

[J63] Jean Carvalho, Hugo Kenji, Ahmad Mohammad, Glaucia Melo, **Max** Mauro, and Deepa Kundur. Dual-Stage LLMs for Adaptive Driving Assistance and Sensor Calibration. IEEE Transactions on Industrial Informatics. **Under Review**

[J62] Jeffrey Qiu, Ahmad Mohammad, Mohammad Al Janaideh, **Max** Mauro, and Deepa Kundur. A Two-Stage Interpretable KAN Framework for Cyberattack Detection on Electric Vehicle Charging Infrastructure. IEEE Transactions on Industrial Informatics. **Under Review**

[J61] Tariq Qayyum, Asad Waqar Malik, **Max Mauro**, and Samee U. Khan. Edge Deployment of Generative AI Models for Industrial Robots. IEEE Transactions on Industrial Informatics. **Under Review**

[J60] João Hoffmann, Asad Malik, João Francisco Filho, and **Max Mauro**. Human-Interpretable Time Series Feature Extraction Using Model-Based Clustering. IEEE Access. **Under Review**

[J59] Giovanna Bueno, João Hoffmann, Asad Malik, Marcio Lobo, João Francisco Justo, and **Max Mauro**. A Comprehensive Review of Advances in 3D Point Cloud Generation and Mesh Texturing. IEEE Access. **Under Review**

[J58] João Hoffmann, Asad Malik, Marcio Lobo, João Francisco Justo, and **Max Mauro**. Intelligent Knock Detection and Adaptive Control in Spark Ignition Engine through Time-Series Deep Learning. IEEE Access. **Under Review**

[J57] Daniel Carvalho, Lucas Reksua, **Max Mauro**, Evandro Leonardo, Leopoldo Rideki, João Francisco Justo, and Asad Waqar Malik (2024). Evaluation of Cluster Algorithms for Radar-Based Object Recognition in Autonomous and Assisted Driving. MDPI Sensors. DOI: https://doi.org/10.3390/s24227219

[J56] Jeferson Lima, Maurício Ribeiro, Frederic Conrad, José Balthazar, Angelo Tusset, and **Max Mauro** (2024). Nonlinear Control and Parametric Uncertainties of Flexible-Joint Robots. Meccanica. DOI: https://doi.org/10.1007/s11012-024-01891-2

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[C31] **Max Mauro** and Letícis Marçal. A Mechanism for Signal Acquisition for Messages in J1939 and FMS Standard. In: Congresso da Sociedade Brasileira Automotive - SAE 2008, 2008, São Paulo. Congresso SAE Brasil 2008, 2008.

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[C28] **Max Mauro**, Letícia Marçal, Júlio Fernandes, and Demétrio Renó (2007). Uma Arquitetura Distribuída para o Sistema de Ilumação Automotiva. In: 1º Colloquium SAE BRASIL de Eletro-Eletrônica Embarcada & Mostra de Engenharia, 2007, Resende - RJ. 1º Colloquium SAE BRASIL de Eletro-Eletrônica Embarcada & Mostra de Engenharia.

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Books

[B7] **Max Mauro** (2020). Veículos elétricos e Híbridos: Fundamentos, Características e Aplicações. 1ª Ed., Editora ERICA, 288p.

[B6] Segio Stevan, Murilo Oliveira; and **Max Mauro** (2018). Indústria 4.0: Fundamentos, perspectivas e aplicações. 1ª Ed. Editora ERICA, 200p.

[B5] Alexandre Baratella and **Max Mauro** (2014). Redes Industriais: Características, Padrões e Aplicações. 1ª Ed., Editora ERICA, 128p.

[B4] **Max Mauro** and Alexandre Baratella (2013). Redes Industriais sem Fio para Automação Industrial. 1ª Ed., Editora ERICA, 120p.

[B3] **Max Mauro** (2010). Redes de Comunicação Automotiva: Caricterísticas, Tecnologias e Aplicações. 1ª Ed., Editora ERICA, 224p.

[B2] **Max Mauro** and Alexandre Baratella (2019). Redes Industriais para Automacao Industrial: AS-I, PROFIBUS e PROFINET. 2ª Ed., Editora ERICA, 176p., 210p.

[B1] **Max Mauro** and Alexandre Baratella (2009). Sistema Fieldbus: DeviceNet, CANOpen, SDS e Ethernet. 1ª Ed., Editora ERICA, 160p.

Patents

US Patent

[P5] US Patent - 1
Title: Method and System and Computer Program Product of Controlling Vehicle Fan Speed to Regulate Coolant Temperature. 2022, Estados Unidos. United States Patent and Trademark Office.

Deposit: 06/30/2022
Authors: Jose Hoffmann, Henrique Avila, Tiago Rosso, and **Max Mauro**.

EU Patent

Submission process: May 17th, 2023

[P4] EU Patent – 4
Title: [IW04] Methods and Apparatus for Autonomous Parking with Detect Space and Path Planning
ID: PJ-23-0467
Authors: Luan Gabriel, Renan José, Hugo Kenji, **Max Mauro**, Lucas Reksua, and Igor Woitexen

[P3] EU Patent – 3
Title: [IW03] Methods and Apparatus for Autonomous Emergency Braking with Computer Vision for Object Detection, Object Tracking and Motion Prediction
ID: PJ-23-0466
Authors: Tiago Horiy, Hugo Kenji, João Hoffmann, **Max Mauro**, Lucas Reksua, and Igor Woitexen

[P2] EU Patent – 2
Title: [IW02] Data Processing Software for Selection and Extraction of Image, Video and, files to Training and Test Algorithms and Strategies of Object Detection and Recognition and, Simulation of ADAS Scenarios
ID: PJ-23-0465
Authors: Jean Brandão, Hugo Kenji, Plinio Villas Boas, **Max Mauro**, Lucas Reksua, and Igor Woitexen

[P1] EU Patent – 1
Title: [IW01] Methods and Apparatus for Surround Perception System with Multi-Rate Sensors for Automotive Systems
ID: PJ-23-0457
Authors: Hugo Kenji, Gabriel Siqueira, Lucas Portello, **Max Mauro**, Lucas Reksua, and Igor Woitexen

10. Supervision

Full information about my supervision can be found at this link:
http://lattes.cnpq.br/6212006974231025

Supervision		
	Completed	**In Progress**
Postdoctoral Fellows	1	0
PhD	2	3
MSc	22	10
Capstone Project	53	2
Undergraduate Research	80	11
Graduate Research	4	0
Other Supervisions	13	0

10.1. Completed

Postdoctoral Fellow (1)

07/2015 - 06/2016 **Benedito de Alencar Arruda**
Course: Electrical Engineering – UTFPR-PG
Project Title: Automotive Electronic Embedded Systems Graduate Program in Electrical Engineering
Scholarship: CAPES

PhD Supervision (2)

03/2021 - 04/2023 **Calequela João Tome Manuel**
Degree: PhD in Industrial Engineering
Thesis: Algorithms Assistance of the Car Maneuvers during Parallel and Perpendicular Parking.
University: Federal Technological University of Paraná – Ponta Grossa
Scholarship: CAPES
Co-supervisor: Max Mauro Dias Santos.

03/2008 - 02/2013 **Alexandre Baratella Lugli**
Degree: PhD in Electrical Engineering
Thesis: Flexible Distributed Architecture for Industrial Application based on the Ethernet Standard
University: Federal University of Itajubá
Scholarship: INATEL
Co-supervisor: Max Mauro Dias Santos

MSc. Supervision (21)

02/2023 - 10/2025 **André de Arruda Falcão Maranhão**
Degree: Master of Science in Electrical Engineering
Dissertation: Comparative Performance Analysis of Vehicles with Different Transmissions.
University: University of São Paulo
Scholarship: N/A

02/2024 - 02/2025 **Giovanna Bueno Marcondes**
Degree: Master of Science in Electrical Engineering
Dissertation: Three-Dimensional Reconstruction Methods of Vehicle Driving Scenarios for Driving Assistance
University: Federal Technological University of Paraná – Ponta Grossa
Scholarship: Funding Agency for Studies and Projects - FINEP

03/2023 - 02/2025 **Gustavo Viana Leite Scheidt**
Degree: Master of Science in Electrical Engineering
Dissertation: Modular Framework for Software-Defined Vehicles using Service-Oriented Architecture
University: Federal Technological University of Paraná – Ponta Grossa
Scholarship: N/A

03/2023 - 12/2024 **Daniel Florencio de Souza**
Degree: Master of Science in Electrical Engineering
Dissertation: Design and Development of an Electric Vertical Take Off and Landing Aircraft System Control using Sliding Model Control System
University: Federal Technological University of Paraná – Ponta Grossa
Scholarship: N/A

03/2021 - 12/2023 **Hilkija Gaius Tosso**
Degree: Master of Science in Electrical Engineering
Dissertation: Model-Based AI Approach for Knock Control in Spark Ignition Engine by Vibration Block Modeling
University: Federal Technological University of Paraná – Ponta Grossa
Scholarship: Renault and Fundação Araucária

05/2021 - 12/2023 **Lucas Silveira Soares**
Degree: Master of Science in Computer Science
Dissertation: Intrusion Detection System in Vehicle Systems: Development Strategy for Preventing Cyber Attacks and Detecting Anomalies
University: Federal Technological University of Paraná – Ponta Grossa
Scholarship: N/A

03/2022 - 08/2023 **Luan Gabriel dos Santos Ayres**
Degree: Master of Science in Electrical Engineering
Dissertation: Development and Simulation of an Autonomous Parking System using Low-Cost Lidar Sensor and Ultrasonic Sensors
Federal Technological University of Paraná – Ponta Grossa
Scholarship: Renault and Fundação Araucária

.

09/2020 – 12/2022 **Mathias Rodrigues da Luz**
Degree: Master of Science in Electrical Engineering
Dissertation: Design and Development of a Voice Assistant Automotive Dashboard Control
University: Federal Technological University of Paraná – Ponta Grossa
Scholarship: Renault and Fundação Araucária

03/2021 – 12/2022 **João Eduardo Hoffmann**
Degree: Master of Science in Electrical Engineering
Dissertation: Design and Development of a Model Predictive Control System for the Thermal Regulation of Refrigerant Fluid
University: Federal Technological University of Paraná – Ponta Grossa
Scholarship: Volvo and Fundação Araucária

04/2020 - 07/2021 **Alan Bastos**
Degree: Master of Science in Computer Science
Dissertation: A Readiness Assessment Method Based on The Rami 4.0 - Reference Architecture Model for Industry 4.0
University: Federal Technological University of Paraná – Ponta Grossa
Scholarship: Renault and Fundação Araucária

08/2019 - 12/2020 **Calequela João Tomé Manuel**
Degree: Master of Science in Electrical Engineering
Dissertation: Design and Development of Algorithms and Control Strategies for Automatic Parking Systems: Advanced Driver Assistance System
University: Federal Technological University of Paraná – Ponta Grossa
Scholarship: Renault and Fundação Araucária

03/2018 - 12/2020 **Manoela Gonçalves Pizyblski**
Degree: Master of Science in Electrical Engineering
Dissertation: Study and Comparative Analysis of Path Planning Algorithms for Autonomous Vehicles
University: Federal Technological University of Paraná – Ponta Grossa
Scholarship: CAPES

03/2018 - 06/2020 **Eduardo El Akkari Sallum**
Degree: Master of Science in Computer Science
Dissertation: Improving Quality-of-Service in LoRa Low-Power Wide-Area Networks through Optimized Radio Resource Management
University: Federal Technological University of Paraná – Ponta Grossa
Scholarship: ABDI

07/2017 - 10/2019 **Eduardo Michailu Mendes**
Degree: Master of Science in Computer Science
Dissertation: Contributions in CAN-Based Systems: Prototypes and Tests
University: Federal Technological University of Paraná – Ponta Grossa
Scholarship: Senai

08/2016 - 07/2018 **Victor Pedroso Ambiel Barros**
Degree: Master of Science in Computer Science
Dissertation: Evaluation of the Performance of Retropropagation Algorithms with Artificial Neural Networks for the Resolutions of Non-Linear Problems
University: Federal Technological University of Paraná – Ponta Grossa
Scholarship: Renault and Fundação Araucária

03/2015 - 05/2017 **João Henrique Zander Neme**
Degree: Master of Science in Electrical Engineering
Dissertation: Workflow for Development of Automotive Embedded Functions in the AUTOSAR Standard
University: Federal Technological University of Paraná – Ponta Grossa
Scholarship: FCA – FIAT CHRYSLER AUTOMOBILES

03/2015 - 04/2017 **David Carvalho Andrade**
Degree: Master of Science in Electrical Engineering
Dissertation: Strategy for Detection and Tracking of Road Tracks using Monocular Camera
University: Federal Technological University of Paraná – Ponta Grossa
Scholarship: FCA – FIAT CHRYSLER AUTOMOBILES

08/2016 - 07/2017 **Lauro Roberto Nunes**
Degree: Master of Science in Electrical Engineering
Dissertation: Application of Automotive Software Validation and Design and Validation of Automotive Software with the Model-Based Design Method
University: Federal Technological University of Paraná – Ponta Grossa
Scholarship: N/A

03/2015 - 05/2017 **Rodrigo Adamshuk Silva**
Degree: Master of Science in Electrical Engineering
Dissertation: Method of Mapping by Reverse Perspective Applied to the Determination of Object Distance in Advanced Driver Assistance Systems
University: Federal Technological University of Paraná – Ponta Grossa
Scholarship: FCA – FIAT CHRYSLER AUTOMOBILES

08/2013 - 12/2016 **Mauro Acras**
Degree: Master of Science in Electrical Engineering
Dissertation: Timing Requirements Analysis for Automotive Embedded Systems
University: Federal Technological University of Paraná – Ponta Grossa
Scholarship: CAPES

08/2015 - 11/2016 **Guilherme Santos**
Degree: Master in Electrotechnical Engineering
Dissertation: Performance Analysis of DSDV, AODV, and OLSR Routing Protocols Applied to a VANET Communication Network
University: ISEP-IPP
Scholarship: UTFPR-PG

08/2013 - 05/2015 **Gilson Dalla Stella**
Degree: Master of Science in Electrical Engineering
Dissertation: Applying the Model-Based Development Methodology for Automotive Software Functions
University: Federal Technological University of Paraná – Ponta Grossa
Scholarship: CAPES

10.2. In Progress

PhD Supervision (3)

- Mathias Rodrigues da Luz – PhD in electrical engineering
- Weslley Medeiros Torres – PhD in electrical engineering
- André de Arruda Falcão Maranhão – PhD in electrical engineering

MSc. Supervision (10)

- Matheus Basso - Master's in electrical engineering
- Vinicius Antunes Silva - Master's in electrical engineering
- Hector Danallora – Master's in electrical engineering
- Daniel Carvalho – Master's in electrical engineering
- Isabella de Oliveira – Master's in electrical engineering
- Vinicius Antunes Silva - Master's in electrical engineering
- Jean Cristhiano Franco – Master's in electrical engineering
- Rafael Santos Dominguez – Master's in electrical engineering
- Antonio Renato Goncalves Crespo – Master's in electrical engineering
- Plínio Villas Boas - Master's in computer science

Capstone Project (2)

- Hugo Kenji - Bachelor's in electrical engineering
- Marcus Winicius - Bachelor's in electrical engineering

Undergraduate Research (11)

- Manuela Klimek - Bachelor's in electrical engineering
- Henrique Serapilha - Bachelor's in electrical engineering

- Jean Brandão Carvalho – Bachelor’s in computer science
- Hugo Kenji Taciro Leal - Bachelor’s in electrical engineering
- Maria Eduarda Pedroni Campos Santos – Bachelor’s in information systems
- João Vitor Campos Santos – Bachelor’s in electrical engineering
- Marcus Winicius Martins - Bachelor's in electrical engineering
- Felipe Souza Forte - Bachelor's in electrical engineering
- Vitor Daniel Holler – Bachelor's in electrical engineering
- Daniel Vaurek Dimbarre – Bachelor’s in electrical engineering
- Maria Eduarda Miara – Bachelor’s in mechanical engineering

11. Master and PhD Committee Member

Full information on participation in Master and PhD committee

Master and PhD Committee Member	
Degree	**Completed**
Master	44
PhD	8

Associate Professor & Department Chair
Department of Electronics
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