CURRICULUM SUMMARY

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1 Education

Period	Duration (months)	Degree/Activity	Institution and advisor/supervisor	Thesis/Dissertation Title
1998-2003	60	Undergraduate	Federal University of Mato Grosso do Sul (UFMS)	
2005-2007	32	Master's	University of São Paulo (USP-EESC) / Prof. José Reynaldo Anselmo Setti	"*Evaluation of performance measurement impact on truck passenger car equivalents*"
2007-2013	74	PhD	University of São Paulo (USP-EESC) / Prof. José Reynaldo Anselmo Setti	"*Automatic system for obtaining vehicular traffic parameters from video images using OpenCV*"

1.1 Education – Additional Information

2020 Paternity Leave – 5-day leave.
2022 Bereavement Leave – 7-day leave.

2 Professional/Academic History

- [03/02/2010 - 12/20/2010] **Substitute Professor** at São Paulo State University (UNESP) "Júlio de Mesquita Filho", Faculty of Engineering of Bauru (FEB), Bauru, SP, Brazil. (Workload: 12h/week).
- [02/14/2013 - 06/30/2014] **Laboratory Specialist** (Superior 1A) at the Department of Transportation Engineering (STT), São Carlos School of Engineering (USP-EESC), São Carlos, SP, Brazil. Public tender under Announcement EESC/USP 11/2012 (Workload: 40h/week).
- [07/01/2014 - Present] **Professor** (MS-3.2) at the Department of Transportation Engineering (STT), São Carlos School of Engineering (USP-EESC), São Carlos, SP, Brazil. Public tender under Announcement ATAc-56/2013 (Workload: Full Dedication to Teaching and Research Regime - RDIDP).

3 Scientific Contributions (Scientific, Technological or Innovation)

1. MORELLI, A.B.; **CUNHA, A.L.** Measuring urban road network vulnerability to extreme events: An application for urban floods. Transportation Research Part D – Transport and Environment. v.93, p.102770, 2021. <DOI: 10.1016/j.trd.2021.102770>.

   This work significantly contributes to understanding urban road network vulnerability to extreme events such as floods, with potential social impact on risk management and urban resilience. Scientifically, it advances spatial modeling of accessibility under adverse conditions. The proposed methodology has been the basis for ongoing research on emergency mobility, road safety, and adaptive planning, as well as fostering innovation in decision support tools for public policies.

2. DE OLIVEIRA, G.J.M.; LAVIERI, P.S.; **CUNHA, A.L.** Integrating a non-gridded space representation into a graph neural networks model for citywide short-term crash risk prediction. Urban Informatics. v.2, p.7, 2023. <DOI: 10.1007/s44212-023-00032-6>

   This study, derived from PhD co-supervision at the University of Melbourne, introduces an innovative approach by integrating non-regularized spatial representations into graph neural network models for citywide crash risk prediction. The technological and scientific impact is notable, advancing the state of the art in artificial intelligence applied to road safety. The research strengthens ongoing projects on accident prediction and prevention, with potential application in intelligent transportation systems and safer, more proactive urban mobility policies.

3. SETTI, J.R; **CUNHA, A.L.**, LUCAS, M.J. Technical Advisory for Autopista Litoral Sul (ALS) on BR-376/PR highway [1]. December 2019. Technical Report on emergency escape area at km 667 of BR-376.

   This technical work had direct impact on operational safety and prevention of serious accidents on one of Brazil's busiest highways (BR-376/PR), between Curitiba/PR and Joinville/SC, through rigorous supervision of field instrumented tests and analysis of escape area efficiency for trucks with overheated brake systems. With evident social relevance, it reinforced the commitment to technological innovation and road safety, while providing robust technical-scientific basis for practical actions and future public policies on road infrastructure.

4. MARCOMINI, L.A.; **CUNHA, A.L.** Truck Axle detection using Neural Networks: analysis of the number of images in the training dataset In: Congresso de Pesquisa e Ensino em Transportes (ANPET), 2023, Santos. Proceedings of the 37th Congress on Transportation Research and Education – 2023. PDF

   This paper innovates by critically evaluating the influence of image volume in training neural networks for automatic truck axle detection, a highly relevant topic for efficient enforcement and road safety. Its technological impact is significant by providing clear guidelines on dataset sizing, facilitating practical and economical application of artificial intelligence in road monitoring, with direct implications for ongoing and future projects on intelligent transportation systems.

5. MORELLI, A.B.; **CUNHA, A.L.** Flood vulnerability: how the predominance of long routes reduces the efficiency of alternative routes In: Congresso Nacional de Pesquisa e Ensino em Transportes (ANPET), 2024, Florianópolis. Proceedings of the XXXVIII National Congress on Transportation Research and Education (ANPET) – 2024. PDF

   This work integrates the research project on transportation network vulnerability, advancing significantly by demonstrating how the predominance of long routes compromises the effectiveness of alternative routes in flood scenarios. With direct impact on public policy formulation and emergency management strategies, it provides robust scientific evidence for planning more resilient urban mobility systems, reinforcing the social, economic and environmental relevance of the ongoing research line.

4 Research Funding

1. CNPq Process 436954/2018-4. *Image-based method for axle detection and truck classification.* University of São Paulo (USP). MCTIC/CNPq Call No. 28/2018 - Universal – Project completed on 04/29/2022.
2. CNPq Process 311964/2022-2. *Artificial Intelligence: development of tools for urban mobility.* University of São Paulo (USP). CNPq Call No. 09/2022 - Research Productivity Grant (PQ). – Duration: 03/01/2023 to 02/28/2026.
3. CNPq Process 409087/2023-8. *Rethinking traffic modeling in transportation networks for the new generation of smart and connected cities.* University of São Paulo (USP). CNPq/MCTI Call No. 10/2023 - Tier B - Consolidated Groups. – Duration: 12/05/2023 to 12/31/2026.
4. Collaborator in project *Application of deep learning in intelligent traffic control system.* Coordinator: Assoc. Prof. Edouard Ivanjko, University of Zagreb (UNIZG) – Duration: 05/11/2018 to 12/31/2018.
5. Collaborator in project *Innovative Control Strategies for Sustainable Mobility in Smart Cities.* Coordinator: Prof. Tonci Caric, University of Zagreb (UNIZG) – Duration: 05/25/2021 to 12/31/2021.

5 Quantitative Indicators

Item	**Quantity**
1) published books	0
2) publications in journals with selective editorial policy	18
3) book chapters	1
4) Master's theses:	16

[1] coverage on USP São Carlos Portal (https://saocarlos.usp.br/professores-da-eesc-supervisionam-ensaios-tecnicos-em-nova-area-de-escape-para-caminhoes/) and interview on Rede Globo's Jornal Hoje program (https://globoplay.globo.com/v/8165879/).

Item	Quantity
4.a) supervised and completed	13
4.b) in progress	3
5) PhD dissertations:	6
5.a) supervised and completed	1
5.b) in progress	5
6) Postdoctoral supervisions:	0
6.a) completed	0
6.b) in progress	0
7) citations received in international scientific literature, according to	
- Web of Science	160
- Google Scholar	460
8) patents filed, granted and licensed	0
9) products developed and launched in the market	0
10) optimized processes implemented in companies or social organizations	0
11) companies created or supported	0
12) relevant technical and scientific consultancies	2

6 Other Relevant Information

6.1 Professional Activities

1. **External Consultant in Transportation Engineering** for Técnicos em Transportes Ltda (TECTRAN), Belo Horizonte, MG, Brazil. – April 2, 2012 to December 1, 2012.
2. **Professor** in the *Transport Infrastructure Training Course*, under agreement between USP and the Ministry of Public Works and Communications of Paraguay (MOPC). (Workload: 47h) – March 1 to November 30, 2018.
3. **Technical Advisory** for Canhedo Beppu Engenheiros Associados Ltda on BR-116/RJ highway, Via Dutra, Serra das Araras. Retroanalysis of escape areas location for trucks without brakes – June to December 2019.

6.2 International Experience

1. **Visiting Researcher** at *TUM-USP Workshop on Sustainable Mobility* held at the Institute of Automotive Technology (FTM), Technical University of Munich (TUM), Munich, Bavaria, Germany. The workshop involved German and Brazilian researchers selected by BAYLAT/FAPESP Call. – November 28 to December 2, 2016.
2. **Visiting Professor** at University of Minho, Guimarães, Portugal. This international mission was part of project approved CAPES-FCT 39/2014 with duration between 2016 and 2018. – July 17-28, 2017.
3. **Visiting Researcher** at *TUM-USP Workshop on Sustainable Mobility* held at USP Polytechnic School, São Paulo, SP, Brazil. The workshop involved German and Brazilian researchers selected by BAYLAT/FAPESP Call. – September 18-21, 2017.
4. **Visiting Professor** at University of Zagreb, Zagreb, Croatia. ERASMUS+ Program: Higher Education Mobility Agreement (UNIZG / USP-EESC). Faculty mobility to share teaching and research experiences in Intelligent Transportation Systems (ITS). (Workload: 13h) – June 4-14, 2018.
5. **Visiting Professor** at University of Melbourne (UniMelb), Melbourne School of Engineering (MSE), Department of Infrastructure Engineering. CAPES Fellow of CAPES-Print Program – 88887.371506/2019-00, Print Program - Junior Visiting Professor – January to December 2020.
6. **Visiting Professor** at University of Zagreb (UNIZG), Zagreb, Croatia. ERASMUS+ Program: Virtual Teaching Mobility (online) - Mobility Agreement. (Workload: 8h) – April 11-15, 2022.

6.3 Awards, Distinctions and Honors

- **ABCR Innovation Salon Award**, 9th Brazilian Congress on Highways and Concessions (CBR&C), 5th Innovation Salon of Brazilian Association of Highway Concessionaires (ABCR) – 2015.

- **Excellence Certificate**, best professor of the Department of Transportation Engineering (USP-EESC-STT), SACivil - Academic Secretariat of Civil Engineering – 2016.
- **Excellence Certificate**, best professor of the Department of Transportation Engineering (USP-EESC-STT), SACivil - Academic Secretariat of Civil Engineering – 2017.
- **ANPET Scientific Production Award**, National Agency for Transportation Research and Education (ANPET) – 2023.