

THIAGO MEIRELES PAIXAO

CURRICULUM VITAE

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DEGREES

- B.Sc. in Computer Science, Universidade Federal de Minas Gerais, February 2007
- M.Sc in Computer Science, Universidade de São Paulo, July 2010
 - Dissertation title: "Object tracking using structural pattern recognition: a static-model approach", supervisor Prof. Roberto Hirata Jr.
- Ph.D in Computer Science, Universidade Federal do Espírito Santo, May, 2022
 - Visiting Researcher at École de Technologie Supérieure (Montreal, Canada), supervisor Prof. Alessandro Lameiras Koerich
 - Thesis title: "Reconstruction of mechanically-shredded documents using deep learning", supervisor Prof. Thiago Oliveira Santos

ABOUT ME

I am a researcher in Artificial Intelligence with experience in problem-solving and applied research in computer vision and, more recently, natural language processing. My career has been centered on both research and teaching in computer science. During my Ph.D. in Computer Science at the Federal University of Espírito Santo (Vitória, Brazil), I worked as a visiting researcher at the École de Technologie Supérieure in Montreal, Canada. I am currently an Associate Professor at the Federal Institute of Espírito Santo, where I advise research in the Applied Computing graduate program and teach in the Bachelor's program in Information Systems. My current research interests include Large Language Models (LLMs), Visual Language Models (VLMs), self-supervised learning, and emotional analysis applied to mental health.

TECHNICAL EXPERTISE AND RESEARCH INTERESTS

My technical expertise includes proficiency in C/C++, Python, and tools such as OpenCV, scikit-learn, scikit-image, pandas, TensorFlow, PyTorch, NLTK, and Hugging Face models. I have substantial experience in Digital Image Processing, Computer Vision, Natural Language Processing, and Scientific Text Writing.

My current research interests include Large Language Models (LLMs), Visual Language Models (VLMs), Self-supervised Learning, and Emotional Analysis applied to Mental Health. For more details on my work, please visit my [Google Scholar profile](#).

HONORS AND AWARDS

(2025) [Honorable mention](#) for the undergraduate research project (student advised: Matheus Silva Caldas) at the Jornada de Integração, Ifes.

(2024) [Third best paper](#) in the Escola Regional de Informática do Espírito Santo (ERI-ES), Brazilian Computer Society.

(2023) [Best Doctorate Work](#) - Workshop of Theses and Dissertations (WTD - SIBGRAPI), Special Interest Group on Computer Graphics and Image Processing (CEGRAPI – SBC).

(2023) [Third place](#) in the XXXVI Thesis and Dissertation Contest (CTD) at CSBC 2023, Brazilian Computer Society.

POSITIONS HELD

Job title: Professor of Information Systems

Company name: Instituto Federal do Espírito Santo (IFES), Serra, Brazil

From: 02/2016

To: Present

Role description: Teaching undergraduate courses: Formal Languages and Automata Theory, Algorithms and Programming, Mathematical Logic, Data Structures, Numeric Calculus. Teaching graduate: Convolutional Neural Networks, Digital Image Processing. Research/advising: Deep Learning, Sign Language Recognition, Emotion Analysis applied to Mental Health, Document Information Extraction, Visual Language Models.

Job title: Visiting Researcher

Company name: École de Technologie Supérieure (ÉTS), Montreal, Canada

From: 09/2019

To: 12/2020

Role description: Investigating neural models and optimization techniques for the task of reconstructing mechanically-shredded documents. Short-term project with Re-ak on emotion state analysis in games using data acquired from body sensors.

Job title: Professor of Computer Science

Company name: Universidade Federal do Espírito Santo (UFES), Alegre and São Mateus, Brazil

From: 12/2011

To: 02/2016

Role description: Teaching undergraduate courses: Computer Theory, Fundamentals of Compilers, Data Structures, Algorithms and Programming, Numeric Calculus, and Digital Image Processing.

Job title: Professor of Information Systems

Company name: UNESC, Colatina, Brazil

From: 03/2013

To: 06/2013

Role description: Teaching undergraduate course: Mathematical Logic.

Job title: Professor of Information Systems

Company name: Faculdade Pitágoras, Linhares, Brazil

From: 08/2011

To: 01/2012

Role description: Teaching undergraduate courses: Algorithms and Programming, Introduction to Operating Systems, Introduction to Operating Systems, Numeric Calculus, and Computer Architecture.

Job title: Professor of Production Engineering

Company name: Faculdades Integradas de Aracruz, Aracruz, Brazil

From: 02/2012

To: 02/2013

Role description: Teaching undergraduate courses: Algorithms and Programming and Numeric Calculus.

Job title: Professor of Production Engineering

Company name: Faculdade de Aracruz, Aracruz, Brazil

From: 03/2011

To: 07/2011

Role description: Teaching undergraduate courses: Algorithms and Programming and Numeric Calculus.

Job title: Programmer

Company name: QualiConsult, Belo Horizonte, Brazil

From: 09/2006

To: 02/2007

Role description: Short-term project on digital fingerprint recognition (Matlab, C++).

PUBLICATIONS

1. **PAIXAO, T. M.**, BERRIEL, R. F., BOERES, M. C. S., KOERICH, A. L., BADUE, C., SOUZA, A. F. D., & OLIVEIRA-SANTOS, T. (2020). Fast(er) Reconstruction of Shredded Text Documents via Self-Supervised Deep Asymmetric Metric Learning. In **Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)**.
2. **PAIXAO, T. M.**, BERRIEL, R. F., BOERES, M. C. S., KOERICH, A. L., BADUE, C., DE SOUZA, A. F., & OLIVEIRA-SANTOS, T. (2020). Self-supervised Deep Reconstruction of Mixed Strip-shredded Text Documents. **Pattern Recognition**, 107, 107535.
3. **PAIXAO, T. M.**, BOERES, M. C. S., FREITAS, C. O. A., OLIVEIRA-SANTOS, T. (2018). Exploring Character Shapes for Unsupervised Reconstruction of Strip-shredded Text Documents. **IEEE Transactions on Information Forensics and Security**, 14(7), 1744-1754.
4. **PAIXAO, T. M.**, BERRIEL, R. F., BOERES, M. C., KOERICH, A. L., BADUE, C., DE SOUZA, A. F., & OLIVEIRA-SANTOS, T. (2022). A human-in-the-loop recommendation-based framework for reconstruction of mechanically shredded documents. **Pattern Recognition Letters**, 164, 1-8.
5. **PAIXAO, T. M.**, BERRIEL, R. F., BOERES, M. C. S., BADUE, C., DE SOUZA, A. F., OLIVEIRA-SANTOS, T. (2018) A Deep Learning-Based Compatibility Score for Reconstruction of Strip-Shredded Text Documents. In: **Conference on Graphics, Patterns and Images (SIBGRAPI)**.
6. **PAIXAO, T. M.**, GRACIANO, A. B. V., CESAR-JR., R. M., HIRATA-JR., R. H. (2008) A Backmapping Approach for Graph-Based Object Tracking. In: **Conference on Graphics, Patterns and Images (SIBGRAPI)**.
7. **PAIXAO, T. M.**, BOERES, M. C., & OLIVEIRA-SANTOS, T. (2023). Unveiling the Secrets: Reconstruction of Shredded Documents using Deep Learning. In: **Anais Estendidos do XXXVI Conference on Graphics, Patterns and Images** (pp. 49-55). SBC. [\[BEST THESIS AWARD\]](#)
8. **PAIXAO, T. M.**, BOERES, M. C., & OLIVEIRA-SANTOS, T. (2023). Deep learning-based reconstruction of shredded documents. In: **Anais do XXXVI Concurso de Teses e Dissertações** (pp. 10-19). SBC. [\[THIRD PLACE IN THE THESIS AWARD\]](#)
9. **PAIXAO, T.M.**, MUCCIACCIA, S. S., NAVARRO, L. C., MUTZ, F., RAMPINELLI, V., BADUE, C., DE SOUZA, A. F. (2025). A machine learning approach for intra-and inter-cast hot metal temperature forecasting. **Computers & Chemical Engineering**, 201, 109210.
10. TABELINI, L., BERRIEL, R., **PAIXAO, T. M.**, BADUE, C., DE SOUZA, A. F., & OLIVEIRA-SANTOS, T. (2021). Keep your eyes on the lane: Real-time attention-guided lane detection. In: **Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)** (pp. 294-302).
11. SILVA, E. D., PEREIRA, T. B., BRANDÃO, C. E., BOLDT, F. D. A., PAIXAO, T. M. (2025). Assessing the Effectiveness of Transfer Learning in Chest X-Ray Analysis With the BRAX Dataset. **IEEE Access**, 13, 164805 – 164817.
12. SOUSA, R. T., SILVA, G. D. M., PINTO, P. L. L., BACKES, J., MOTA, A. S., **PAIXÃO, T. M.**, TEIXEIRA, M. G. S., HISATUGU, W. H., GARCIA, A. S., PRADO, K. S., DIAS, R. S., GALLETTA, M. A., & TAVARES, H. (2025). Depression and Anxiety Screening for Pregnant Women via Free Conversational Speech in Naturalistic Condition. **IEEE Access**, 13, 52149–52156.
13. BASÍLIO, G., PEREIRA, T., KOERICH, A., TAVARES, H., DIAS, L., TEIXEIRA, M., SOUSA, R., HISATUGU, W., MOTA, A., GARCIA, A., GALLETTA, M., & **PAIXÃO, T. M.** (2025). AI-Driven Early Mental Health Screening: Analyzing Selfies of Pregnant Women. In: **International Conference on Health Informatics (HEALTHINF)**.
14. ALVES, C. E. G., BOLDT, F. D. A., & **PAIXAO, T. M.** (2024). Enhancing Brazilian Sign Language Recognition through Skeleton Image Representation. In: **Conference on Graphics, Patterns and Images (SIBGRAPI)**.

15. BROMONSCHENKEL, G., OLIVEIRA, H., **PAIXAO, T. M.** (2024). A Comparative Evaluation of Transformer-Based Vision Encoder-Decoder Models for Brazilian Portuguese Image Captioning. In: **Conference on Graphics, Patterns and Images (SIBGRAPI)**.
16. AMORIM, L. L., MUTZ, F., **PAIXAO, T. M.**, RAMPINELLI, V., DE SOUZA, A. F., BADUE, C., & OLIVEIRA-SANTOS, T. (2025). Blast furnace control by hierarchical similarity search in historical data. **Engineering Applications of Artificial Intelligence**, 141, 109779.
17. MUCCIACCIA, S. S., **PAIXAO, T. M.**, MUTZ, F., DE SOUZA, A. F., BADUE, C., & OLIVEIRA-SANTOS, T. (2025). Automatic Multiple-Choice Question Generation and Evaluation Systems Based on LLM: A Study Case With University Resolutions. In: **31st International Conference on Computational Linguistics (COLING)**.
18. MUCCIACCIA, S. S., **PAIXAO, T. M.**, MUTZ, F., DE SOUZA, A. F., BADUE, C. S., OLIVEIRA-SANTOS, T. (2025). Pt-HotpotQA: Evaluating Multi-Hop Question Answering on Original and Portuguese-translated Datasets Using LLMs. **Journal of the Brazilian Computer Society**, 31(1), 872-884.
19. NAVARRO, L. C., MUTZ, F., **PAIXAO, T. M.**, ZANETTI, G. G., BADUE, C., DE SOUZA, A. F., OLIVEIRA-SANTOS, T. (2025). RagPharma: A RAG-Based Chatbot for Medicine Leaflets with a Dual-Dataset Evaluation Framework. **Journal of the Brazilian Computer Society**, 31(1), 1137–1149.
20. NAVARRO, L. C., AMORIM, L. L., BERRIEL, R., **PAIXAO, T. M.**, RAMPINELLI, V., WASEM, L. A., ... & OLIVEIRA-SANTOS, T. (2022). Temperature prediction in blast furnaces: a machine learning comparative study. In: **Conference on Graphics, Patterns and Images (SIBGRAPI)**.
21. ARRUDA, V. F., BERRIEL, R. F., **PAIXAO, T. M.**, BADUE, C., DE SOUZA, A. F., SEBE, N., & OLIVEIRA-SANTOS, T. (2022). Cross-domain object detection using unsupervised image translation. **Expert Systems with Applications**, 192, 116334.
22. TABELINI, L., BERRIEL, R., **PAIXAO, T. M.**, DE SOUZA, A. F., BADUE, C., SEBE, N., & OLIVEIRA-SANTOS, T. (2022). Deep traffic sign detection and recognition without target domain real images. **Machine Vision and Applications**, 33(3), 50.
23. BADUE, C., GUIDOLINI, R., CARNEIRO, R. V., AZEVEDO, P., CARDOSO, V. B., FORECHI, A., JESUS, L., BERRIEL, R., **PAIXAO, T. M.**,... & DE SOUZA, A. F. (2020). Self-driving cars: A survey. **Expert Systems with Applications**, 113816.
24. SARCINELLI, RENAN, GUIDOLINI, RÂNIK, B. CARDOSO, V., **PAIXAO, T. M.**, F. BERRIEL, R., AZEVEDO, PEDRO, F. DE SOUZA, A., BADUE, CLAUDINE, OLIVEIRA-SANTOS, T. (2019). Handling pedestrians in self-driving cars using image tracking and alternative path generation with Frenét frames. **Computer & Graphics**, v. 84, p. 173-184, 2019.
25. DE MELLO, J. P. V., TABELINI, L., BERRIEL, R. F., **PAIXAO, T. M.**, DE SOUZA, A. F., BADUE, C., ... & OLIVEIRA-SANTOS, T. (2020). Deep traffic light detection by overlaying synthetic context on arbitrary natural images. **Computers & Graphics**.
26. TABELINI, L., BERRIEL, R., **PAIXAO, T. M.**, BADUE, C., DE SOUZA, A. F., & OLIVEIRA-SANTOS, T. (2020). PolyLaneNet: Lane Estimation via Deep Polynomial Regression. In: **International Conference on Pattern Recognition (ICPR)**. IEEE
27. POSSATTI, L. C., GUIDOLINI, RANIK, CARDOSO, V. B., BERRIEL, R. F., **PAIXAO, T. M.**, BADUE, CLAUDINE, DE SOUZA, A. F., OLIVEIRA-SANTOS, T. (2019). Traffic Light Recognition Using Deep Learning and Prior Maps for Autonomous Cars. In: **International Joint Conference on Neural Networks (IJCNN)**.
28. ARRUDA, V. F., **PAIXAO, T. M.**, BERRIEL, R. F., DE SOUZA, A. F., BADUE, CLAUDINE, SEBE, NICU, OLIVEIRA-SANTOS, T. (2019). Cross-Domain Car Detection Using Unsupervised Image-to-Image Translation: From Day to Night. In: **International Joint Conference on Neural Networks (IJCNN)**.
29. TORRES, L. TABELINI, **PAIXAO, T. M.** , BERRIEL, R. F., DE SOUZA, A. F., BADUE, CLAUDINE, SEBE, NICU, OLIVEIRA-SANTOS, T. (2019). Effortless Deep Training for Traffic Sign Detection Using Templates and Arbitrary Natural Images. In: **International Joint Conference on Neural Networks (IJCNN)**.
30. PAULUCIO, L. S., **PAIXAO, T. M.** , BERRIEL, R. F., BADUE, C., DE SOUZA, A. F., & OLIVEIRA-SANTOS T. (2020). Product Categorization by Title Using Deep Neural Networks as Feature Extractor. In: **International Joint Conference on Neural Networks (IJCNN)**. IEEE.
31. DE MORAES, J. L., NETO, J. O., CORREIA-SILVA, J. R., **PAIXAO, T. M.**, BADUE, C., OLIVEIRA-SANTOS, T., DE SOUZA, A. F. (2021). Sysfrutos Papaya: a Dataset for Detection and Classification of Diseases in Papaya. In: **Proceedings of the International Conference on Artificial Neural Networks (ICANN)**.

32. DA PAIXAO, W. R., **PAIXAO, T. M.**, COSTA, M. C. B., ANDRADE, J. O., PEREIRA, F. G., KOMATI, K. S.. (2018). Texture Classification of Sea Turtle Shell Based on Color Features: Color Histograms and Chromaticity Moments. *International Journal of Artificial Intelligence & Applications (IJAIA)*, v. 9, p. 55-67.
33. BERRIEL, R. F., **PAIXAO, T. M.**, NICCHIO, I., OLIVEIRA-SANTOS, T. (2018). Controlling First-Person Character Movement: A Low-Cost Camera-based Tracking Alternative for Virtual Reality. In: **Proceedings of SBGames**.
34. MATTOS, S. L., BOLDT, F. D. A., **PAIXAO, T. M.** (2025). Comparative Evaluation of Text Recognition Methods for Field Extraction in Brazilian National Driver's Licenses. In: **Seminário Integrado de Software e Hardware (SEMISH)** (pp. 97-108). SBC.
35. DE SOUZA, M. R., SILVA, D. P., & PAIXAO, T. M. (2025). Previsão de demanda de curto prazo usando aprendizado de máquina com dados por telemetria: Um estudo de caso no Brasil. In: **Seminário Integrado de Software e Hardware (SEMISH)** (pp. 345-356). SBC.
36. FREITAS, R. H., **PAIXAO, T. M.**, BERRIEL, R. F., SOUZA, A. F., BADUE, C., OLIVEIRA-SANTOS, T. (2019). Relevant Traffic Light Localization via Deep Regression. In: *Anais Do XVI Encontro Nacional de Inteligência Artificial e Computacional (ENIAC)*.
37. PEREIRA, M. W. C., **PAIXAO, T. M.**, CASTRO, F. Z. (2023). Pré-diagnóstico de câncer de mama usando imagens histopatológicas com pré-processamento morfológico por meio de algoritmos clássicos e redes neurais profundas. In: *Anais Estendidos da Conference on Graphics, Patterns and Images*.
38. BARBOSA, C. E., PEREIRA, T. B., DO CARMO, I. M., TELLO, R. J., BOLDT, F. A., **PAIXAO, T. M.** (2024). Reconhecimento de Texto para Sistemas Air Writing: Um Estudo Experimental. In: **Escola Regional de Informática do Espírito Santo (ERI-ES)** (pp. 21-30). SBC.
39. MARTINS, A. F., XAVIER, B. H., PEREIRA, T. B., MOURA, D. G., DE PP MARINHO, E., **PAIXAO, T. M.**, & TELLO, R. J. (2024). Visão Computacional e Controle de Força em Garras Robóticas: Uma Abordagem Integrada. In: **Escola Regional de Informática do Espírito Santo (ERI-ES)** (pp. 181–184). SBC.
40. DIAS, L., FERREIRA, E. O., DE ASSIS BOLDT, F., FARIA, M. V., **PAIXAO, T. M.** (2024). Segmentação de estradas em mapas de remissão utilizando redes neurais. In: **Escola Regional de Informática do Espírito Santo (ERI-ES)**, pp. 147–156. SBC.
41. FARIA, M. V., DIAS, L., FERREIRA, E. O., **PAIXAO, T. M.**, & BOLDT, F. A. (2024). Aprimoramento de modelos de classificação com dados enriquecidos via web scraping: um estudo de caso da competição Dog Breed Identification. In: **Escola Regional de Informática do Espírito Santo (ERI-ES)**, pp. 127–136. SBC.
42. DE SOUZA, L. T., **PAIXAO, T. M.**, TELLO, R. J. (2025). Driver Drowsiness Detection: Comparative Analysis of BiLSTM and CNN + BiLSTM Architectures. In: **Escola Regional de Informática do Espírito Santo (ERI-ES)** (pp. 61–69). SBC.
43. DE SOUZA, L. T., CALDEIRA, R. A., LEAL, S. D., DE SOUZA, M. C. P., **PAIXAO, T. M.**, TELLO, R. J. (2025). Desenvolvimento e Avaliação de um Sistema de Escrita e Desenho no Ar com Caneta Eletrônica e VLMS. In: **Escola Regional de Informática do Espírito Santo (ERI-ES)** (pp. 100-109). SBC.