PhD. Omar Vidal Pino
Curriculum Vitae

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AREAS OF SPECIALIZATION

Computer Vision (CV) and Pattern Recognition, Machine Learning (ML) and Deep Learning.

RESEARCH AREAS

Image Semantic Understanding; Features Descriptions; Semantic Features Representation; Object Recognition, Object Description and Semantic Classification.

DOCTORAL RESEARCH

"Semantic Description of Objects in Images Based on Prototype Theory [1]"

Motivated by the human approach to representing natural semantic categories and based on Prototype Theory foundations, my research propose a mathematical framework to represent the internal structure of semantic categories. Unlike other prototype learning approaches, my mathematical framework proposes a first approach in the attempt to provide deep neural networks with the ability to model abstract semantic concepts such as: category central semantic meaning (semantic prototype), typicality degree of object's image, and family resemblance relationship. I proposed several methodologies based on the typicality's concept, in order to evaluate my model in image semantic processing tasks such as: image classification, global semantic description of images, and transfer learning. Experiments showed that the approach may be an admissible proposition in the effort to endow machines with greater abstraction for the semantic representation of objects' categories.

AWARDS

2017-2019	**Research Development Foundation (FUNDEP) Scholarship** Directorate of Innovation and Teaching Methodologies (GIZ / PROGRAD), *Federal University of Minas Gerais, Brazil*
2016-2017	**Undergraduate Rectory Scholarship** Directorate of Innovation and Teaching Methodologies (GIZ / PROGRAD), *Federal University of Minas Gerais, Brazil*
2014-2018	**Coordination for the Improvement of Higher Education Personnel (CAPES) Scholarship** PhD Program –Department of Computer Science *Federal University of Minas Gerais, Brazil*
2007	**Summa Cum Laude – Computer Science** *University of Oriente, Cuba.*

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[1] See project website: https://www.verlab.dcc.ufmg.br/global-semantic-description/

EDUCATION

2014 – 2020	**Doctor of Philosophy** Computer Science *Federal University of Minas Gerais, Brazil.*
2009 – 2011	**Master of Science** Applied Computing *University of Camagüey, Cuba.*
2002 – 2007	**Bachelor of Computer Science** Department of Computer Science *University of Oriente, Cuba.*

SKILLS

Hard Skills

HIGHT LEVEL	Statistical Machine Learning, Deep Learning (DNN, CNN, LSTM), OpenCV, Dlib, C++, Python, R, Tensorflow, PyTorch, Keras, Scikit-learn, Singularity, Docker, Git, Shell, Linux, LaTeX.
INTERMEDIATE	Project Management Tool (Monday), Agile Development Software (Trello), Matlab, PHP, HTML, CSS, MySQL, Embedded System Hardware & Support.
BASIC	Repository software (DSpace), Content Management System, DNS-Server, DHCP-Server, Linux-Server.

Soft Skills

Commitment and enthusiasm / Responsible and hardworking / Problem solving / Teamwork - collaboration / Team-Project Manager / Communication Skills/ Multi-tasking.

COMMUNICATION SKILLS

Languages

SPANISH	Native or bilingual proficiency
PORTUGUESE	Full professional proficiency
ENGLISH	Professional working proficiency

Activities

CONFERENCES	(English) Oral Presentation at Computer Vision Conferences – 2019, 2020.
POSTERS/TALKS	(Portuguese) Congress Organizer, Poster at the UFMG Knowledge Week, Talks at UEA Informatics Week – 2016, 2017,2019.

EXPERIENCE ABSTRACT

TEACHING	8 years.
RESEARCH	8 years.
SOFTWARE ENGINEER	7 years.
CV & ML ENGINEER	6 years.
CV & ML TEAM LEADER	1 year.

TEACHING

2015-2016   **Teaching Assistant**
DCC114 - Introductory Digital Systems Laboratory
Instructor: PhD Antonio Otavio Fernandes,
Computer Science Department,
Federal University of Minas Gerais, Brazil.

2010-2013   **Lecturer**
UCPPT_FC - Introduction to C++ Programming
Faculty of Computing, Las Tunas,
University of Pedagogical Sciences, Cuba.

2007-2010   **Lecturer**
ULT_TS - Mathematical Analysis
Faculty of Technical Sciences,
University of Las Tunas, Cuba.

2004-2006   **Teaching Assistant**
UO_CSD - Programming Languages, Design and
Implementation
Instructor: PhD Henry Anaya Sánchez,
Computer Science Department,
University of Oriente, Cuba.

WORK EXPERIENCE

CURRENT, FROM JULY 2021   (FT [2])
Maxtrack Industrial LTDA [3] - Brazil.
Systems Development Manager/Research Team Leader

Responsible for improving the Maxtrack company's ML/IA systems and incorporating new technology as needed. Plan and coordinate the maintenance, updating and implementation of Artificial Intelligence / Computational Vision systems.

SEPTEMBER 2020 – JULY 2021   (FT)
Maxtrack Industrial LTDA - Brazil.
Research Team Leader (Computer Vision)

I started leading the Computer Vision and Artificial Intelligence (AI) research in the MXT Hardware & Engineer Department. We develop a complete Edge-AI solution that includes a Driver Monitoring System (DMS) and Advanced driver-assistance systems (ADAS) based on Computer Vision and AI.

DECEMBER 2019 – SEPTEMBER 2020   (FT)
Maxtrack Industrial LTDA - Brazil.
Researcher / Senior Computer Vision and Machine Learning Engineer

As a researcher in R&D Maxtrack project (a collaboration with Smart Sense Laboratory[4] - UFMG), I contributed to the development of Edge-

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[2] Notation used: FT / PT (Full Time or Part Time position)
[3] Website: https://www.maxtrack.com.br/
[4] Project Website: http://smartsenselab.dcc.ufmg.br/en/project/v-video-analytics-solutions/

PUBLICATIONS

Thesis and Dissertation

Pino, Omar Vidal (2020). Semantic Description of Objects in Images Based on Prototype Theory, PhD thesis, Federal University of Minas Gerais (UFMG), Belo Horizonte, Brazil. Advisor: PhD. Montenegro Campos, Mario Fernando.

Pino, Omar Vidal (2011). A Smart Tool for Managing Bank Accounts, M.Sc Dissertation, University of Camagüey, Camagüey, Cuba. Advisor: PhD. Martínez Folgoso, Sandro.

Pino, Omar Vidal (2007). Visual Attention in Log-Polar Images, B.Sc Manuscript, University of Oriente, Cuba. Advisor: M.Sc Tamayo Asencio, Nadia.

Conferences and Journals

Omar Vidal Pino, Erickson R. Nascimento, Mario F. M. Campos. Introducing the structural bases of typicality effects in deep learning. In *Image and Vision Computing* (IMAVIS), 2021, doi: 10.1016/j.imavis.2021.104249.

Omar Vidal Pino, Erickson R. Nascimento, Mario F. M. Campos. (2021). Semantic Description and Classification of Objects based on Prototype Theory, 2020: 1906.03365v4

Omar Vidal Pino, Erickson R. Nascimento, Mario F. M. Campos. Semantic Description of Objects in Images Based on Prototype Theory. In *33nd IEEE Conference on Graphics, Patterns and Images (SIBGRAPI)*, Porto de Galinhas, Pernambuco, Brazil, November, 2020.

Omar Vidal Pino, Erickson R. Nascimento, Mario F. M. Campos. Prototypicality effects in global semantic description of objects. In *Winter Conference on the Applications of Computer Vision* (WACV), Hawaii, USA, 2019.

Omar Vidal Pino, Erickson R. Nascimento, Mario F. M. Campos. Semantic Description of Objects based on Prototype Theory. In Doctor Consortium at WACV, Hawaii, USA, 2019.

Anderson Tavares, David Saldaña, Hayllander Blonski, Hector Azpúrua, Jhielson Pimentel, Omar Pino, Rafael Colares, Douglas Macharet, and Luiz Chaimowicz. Y-Rescue Team Description Paper. In RoboCup, Hefei, China, 2015.

Omar Vidal Pino, Sandro Martínez-Folgoso. Gestcu: A smart tool for managing bank accounts. In National Forum of Science and Technology of Central Bank of Cuba, Havana, 2013.

Vidal Pino, Omar; Guerrero Pérez, Lisandra. Log-polar image: spatially-variant vision model. A Literature Survey(Imagen Log-Polar: Modelo de visión espacio-variante). Innovación Tecnológica, 2012, vol. 18, no 1.

Mora Arias, Rigoberto; **Vidal Pino, Omar**; Guerrero Pérez, Lisandra. Data mining techniques using Weka Knowledge Explorer (Aplicación de técnicas de minería de datos con Weka Acknowledge Explorer.). Innovación Tecnológica, 2011, vol. 17, no 1.

AI solutions that create safer and better driving experiences. I started conducting research related to design and development of computer vision features that improve its performance when are deployed in low cost and customized embedded systems/IoT devices.

MAY 2014 – FEBRUARY 2020 (FT)

Laboratory of Computer Vision and Robotics (Verlab) – Federal University of Minas Gerais, Brazil.
Researcher/PhD Student

Research, Teaching and Publishing. Thesis: Semantic Description of Objects in Images Based on Prototype Theory; Field: Computer Vision.

APRIL 2019 – DECEMBER 2019 (PT)

Invent Vision [5] – Brazil.
Researcher / Senior Computer Vision and Machine Learning Engineer

A R&D Project focused on landing artificial intelligence in the industrial sector (Industry 4.0 concepts). This position allowed me to make a transition from purely theoretical work to industrial applications using Computer Vision techniques. In addition to research, the position required the development, construction, testing and maintenance of complete Computer Vision solutions for Inspection, Monitoring, Quality Control and Industrial Automation applications.

MARCH 2016 – MARCH 2019 (PT)

Federal University of Minas Gerais – Brazil.
Senior Data Engineer

Board member of the First UFMG Institutional Repository. I conducting the tasks of design, construction, development, testing and maintaining the system architectures (databases and large-scale processing systems) for data generation of the First Institutional Repository of Federal University of Minas Gerais (UFMG).[6]

MARCH 2013 – JANUARY 2014 (FT)

DIVEP Trading Company – Las Tunas branch, Cuba.
Machine Learning and Business Intelligence Engineer

This job had the responsibility of designing, developing and maintaining Business Intelligence (BI) solutions for the automotive industry. The position required experience in Database Knowledge Discovery (KDD), Data Mining, and Machine Learning Techniques..

OCTOBER 2007 – FEBRUARY 2013 (FT)

Central Bank of Cuba – Las Tunas branch, Cuba.
Systems Administrator and Software Engineer

In this position I had the responsibility of guaranteeing the continuous and optimal performance of IT / Banking / Financial Services and support systems. The position also requiered the development of business intelligence applications for bank sector using ML, KDD, Data Mining and BI technologies.

SEPTEMBER 2009 - DECEMBER 2011 (PT)

Faculty of Computing – University of Camagüey, Cuba.
Researcher/M.Sc Student

As part of my M.Sc Dissertation, I developed an AI-Recommendation Engine System based on Data Mining, Machine Learning and Business Intelligence techniques to track and prevent fraudulent, suspicious or corrupt bank transactions. Field: Machine Learning/Data Mining and

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[5]Website: http://www.inventvision.com.br
[6]Project website: https://repositorio.ufmg.br/

UNIVERSITY EXTENSION

2021-PRESENT	**Editorial Board of ÚNICA Journal,** ISSN: 2594-9624.
2019-PRESENT	**Reviewer of Journal of Control, Automation and Electrical Systems.**

UFMG Community

2016-PRESENT	**Reviewer of Congress of Innovation and Teaching Methodologies** Directorate of Innovation and Teaching Methodologies *Federal University of Minas Gerais, Brazil.*
2016-2019	**Organizer of the Congress of Innovation and Teaching Methodologies** Directorate of Innovation and Teaching Methodologies *Federal University of Minas Gerais, Brazil.*
2016-2019	**Board member of the First UFMG Institutional Repository** Advisor: PhD. Eucidio Pimenta Arruda. *Federal University of Minas Gerais, Brazil.*
2019	**Invited Talks/XIII UEA Informatics Week** Computer Vision: the most powerful manifestation of Artificial Intelligence that is building the future. Tutorial Presentation, November 27-30. *University of Amazonas (UEA), Brazil.*
2017	**Invited Talks/UFMG Knowledge Week** Innovation and improvements in the quality of undergraduate education at UFMG. Talks, October 16-20. Advisor: PhD. Eucidio Pimenta Arruda. *Federal University of Minas Gerais, Brazil.*
2016	**Invited Talks/UFMG Knowledge Week** Analysis of the Innovation and improvements in the quality of undergraduate education at UFMG.Talks, October 17-21. Advisor: PhD. Eucidio Pimenta Arruda. *Federal University of Minas Gerais, Brazil.*

ACRP Community

2009-2013	**Member of Cuban Association of Pattern Recognition (ACRP).** *University of Las Tunas, Cuba.*
2010	**VIII National Congress of Patterns Recognition (RECPAT 2010).** Invited/Representing the University of Las Tunas, Cuba *Cayo Coco, Ciego de Avila, March 1-3, 2011.*
2009	**VII National Congress of Patterns Recognition (RECPAT 2009).** Invited/Representing the University of Las Tunas, Cuba *University of Oriente, December 10-12, 2009.*

Business Intelligence.

Computer Science Department – University of Oriente, Cuba.
Junior Software Engineer

Member of the Software Development Laboratory "Casa del Software".
This position started my initial learning curve in software development
for the healthcare and industrial sectors.