



Micael Carvalho

Machine Learning Scientist

Contact me

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GitHub: [MicaelCarvalho](https://github.com/MicaelCarvalho)

Languages

Portuguese	Native
English	Fluent
French	Fluent
Spanish	Intermediate

Teaching

Visual Rec. TA (2017)

Deep Learning TA (2016)

Multimedia TA (2016)

Arduino (2014, 2 x 2015)

Computer Org. TA (2014)

Embedded Sys. TA (2013)

Extra

(2021-now, for fun)

Lead FR translator for FSD

(2017)

Winner, reading group at

International Computer Vision

Summer School ([link](#))

(2012, 2015)

International Collegiate

Programming Contest (ICPC)

South America Finalist

creator of

[bootstrap.pytorch](#), [DjLu](#)

Scientific Reviewer

CVPR 2020-2024,

ICCV 2021-2023,

ACCV 2020-2022,

IEEE TMM 2020-2023,

BMVC 2019-2021,

IEEE ICDEW/DECOR 2018,

RFIAP 2018,

ALGOCH 2020,

WACV 2021

Outstanding Reviewer

CVPR 2020, BMVC 2020

Experience

2019 - now **Senior / Staff Machine Learning Scientist** [Tesla Autopilot](#)

- Created 1st multicam video NN with a small team, the Full Self-Driving (FSD) product was constructed based on this work. Trained all networks from FSD v0 through v10. They were shipped to over 2 million customers. Patent 17/820849 Carvalho et al

- Tech lead of a team of 10 engineers and 600 data analysts, responsible for the detection of everything that does not move by itself (static obstacles), as well as road connectivity and guidance.

- Created and adapted many network components to run efficiently and correctly on custom hardware with limited vocabulary.

- Started a project to replace the motion planning stack with neural networks. This project replaced FSD on v12 with end-to-end networks and is shipping to customers.

2019 **Postdoctoral Research Fellow** [Simon Fraser University + Borealis AI](#)

Latent spaces, generative models: VAEs, Flows. Supervised by Greg Mori.

2010 - 2013 **Software Engineer** [Fundação para Inovações Tecnológicas / FlySolution](#)

R&D for automated provisioning (telecom), public payphones with WiFi diffusion, development of internal libraries. / ERP development using Java, Servlet, JSP, Hibernate, MySQL, & more.

2009 - 2010 **Software Engineer** [Núcleo de Desenvolvimento de Jogos Digitais](#)

Development of digital games using C++, Delphi, and box2d. In charge of image processing, acquisition to segmentation. [Video demo](#).

Education

2015 - 2018 **PhD in Computer Science / AI / Vision** [Sorbonne University / UPMC](#)

Title: "Deep Representation Spaces"

Topics: Deep learning, image classification, feature space understanding, knowledge transfer, representation learning, metric learning.

Awards: Scholarship by CNPq, SIGIR grant, ICVSS grant.

2013 - 2015 **MSc in Electrical Engineering** [University of Campinas](#)

Title: "[Transfer Schemes for Deep Learning in Image Classification](#)"

Topics: Transfer learning, automated melanoma screening, robustness of deep features, representation techniques.

Scholarship awards: (national) Samsung, (international) Santander.

2011 - 2012 **Undergraduate research** [São Paulo State Technological College](#)

Dissertation's supervisor: José Luís Zem

Title: "Parallel and distributed programming in computer cluster."

2009 - 2012 **BSc of System Analysis and IT** [São Paulo State Technological College](#)

Dissertation's supervisor: Kleber de Oliveira Andrade

Title: "Artificial neural networks for facial emotions scanning."

Award: Best technical work at academic symposium. [See video](#).

Bibliographic production

- 2019 **Arbitrarily-conditioned Data Imputation**
AABI [OpenReview](#)
[Micael Carvalho](#), Thibaut Durand, Jiawei He, Nazanin Mehrasa, Greg Mori.
2nd Symposium on Advances in Approximate Bayesian Inference.
- 2018 **Cross-modal retrieval in the cooking context: Learning semantic text-image embeddings**
SIGIR [arXiv](#), [DOI](#)
[Micael Carvalho](#)^{*}, Rémi Cadène^{*}, David Picard, Laure Soulier, Nicolas Thome, & Matthieu Cord.
International ACM SIGIR Conference on Research and Development in Information Retrieval.
- 2018 **Images & Recipes: Retrieval in the cooking context**
ICDE/DECOR [arXiv](#), [slides](#) [DOI](#)
[Micael Carvalho](#)^{*}, Rémi Cadène^{*}, David Picard, Laure Soulier, and Matthieu Cord.
IEEE International Conference on Data Engineering (ICDE), Data Engineering meets Intelligent Food and Cooking Recipe (DECOR) workshop.
- 2017 **Inspiring Computer Vision System Solutions**
ICVSS [arXiv](#)
Julian Zilly, Amit Boyarski, [Micael Carvalho](#), Amir Atapour Abarghouei, Konstantinos Amplianitis, Aleksandr Krasnov, Massimiliano Mancini, Hernán Gonzalez, Riccardo Spezialetti, Carlos Sampedro Pérez, and Hao Li.
Winning entry for the reading group competition of the International Computer Vision Summer School (ICVSS).
- 2016 **Deep Neural Networks Under Stress**
ICIP [arXiv](#), [extra](#), [DOI](#)
[Micael Carvalho](#), Matthieu Cord, Sandra Avila, Nicolas Thome, and Eduardo Valle.
IEEE International Conference on Image Processing (ICIP), Phoenix, Arizona, USA.
- 2016 **Towards Automated Melanoma Screening: Proper Computer Vision & Reliable Results**
Tech. Report [arXiv](#), [extra](#)
Michel Fornaciali, [Micael Carvalho](#), Flávia Vasques Bittencourt, Sandra Avila, and Eduardo Valle.
- 2015 **Building up Conceptual Spaces: An ESOM Supported Strategy**
BRACIS [PDF](#), [DOI](#)
Suelen de Paula, [Micael Carvalho](#), and Ricardo Gudwin.
Brazilian Conference on Intelligent Systems (BRACIS), Natal, Brazil.
- 2014 **Statistical Learning Approach for Robust Melanoma Screening**
SIBGRAPI [PDF](#), [DOI](#)
Michel Fornaciali, Sandra Avila, [Micael Carvalho](#), and Eduardo Valle.
27th Conference on Graphics, Patterns and Images (SIBGRAPI), Rio de Janeiro, Brazil.