Douglas De Rizzo Meneghetti

Ph. D., AI researcher and machine learning specialist

Professional Experience

July 2024 – Present — **Senior Machine Learning Engineer**, *Orbia*

June 2023 – June 2024 — **AI Research Specialist**, *Samsung Electronics*

- Contributed to the research and development of digital health solutions for mobile and wearable devices.

July 2021 – March 2023 — **Machine Learning Specialist**, *Adroit Robotics*

- Implemented a Faster R-CNN object detection system to find tree seedlings, dead trees and large replants in citrus orchards, as well as a counting algorithm for unproductive tree slots.
- Trained image classifiers (ResNet-50, Vision Transformer) to detect different levels of lens flare in outdoors photos.
- Optimized PyTorch-based machine learning pipelines for fast execution in the cloud (using prefetching in the GPU, threaded downloads, multiprocessing).
- Adapted machine learning codebases and migrated Docker images to be executed in AWS Batch.

March 2017 – August 2021 — **Full-time scholarship holder**, *FEI University Center*

- Created an object detection system in TensorFlow + ROS used by a Latin American award winning domestic robot.
- Created deep neural networks for multi-agent reinforcement learning system in PyTorch.
- Maintainer of an open source academic formatting software adopted institution-wide..

April 2016 – December 2016 — **Consultant**, *Sao Paulo Municipal Secretary of Education*

Sole developer of a full-stack Java EE mobile web application for large scale educational assessment (Provinha Brasil) of elementary grade students. Frameworks involved include PostgreSQL, Wildfly 9, Hibernate ORM, Enterprise Java Beans, PrimeFaces, the R language and Rserve.

April 2014 – December 2014 — **Researcher**, *FEI University Center*

- Functional and usability tester for an electronic health record system.
- Responsible for database and server maintenance as well as software documentation.
- Project was a partnership between FEI University Center, Volans and Hospital Heliópolis, with funding provided by FINEP.

January 2012 – July 2012 — **Intern**, *Cloud Ideas*

Responsible for the development in all layers of the MVC pattern and for the object-relational mapping and database modelling using Entity Framework Code First.

June 2011 – January 2012 — **Intern**, *Enygma Tecnologia*

Collaborated in developing a system to send electronic receipts for the federal government using ASP.NET Web Forms, the FlexDocs library, SQL Server 2008 and DevExpress web components.

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Education

2017–2021 **Doctorate Degree – Electrical Engineering**, *FEI University Center*, Sao Bernardo do Campo

- Research topic: Heterogeneous deep multi-agent reinforcement learning using graph neural networks.
- Awarded best PhD thesis of 2021.
- 1st place – 2017 Latin America Robotics Competition (LARC), @Home category.
- 1st place – 2018 Latin America Robotics Competition (LARC), @Home category.

2013–2015 **Masters Degree – Electrical Engineering**, *FEI University Center*, Sao Bernardo do Campo

- Research topic: A clustering-based item selection method for computerized adaptive tests.
- 3rd place – 2015 Latin America Robotics Competition (LARC), @Home category.
- 1st place – 2016 Latin America Robotics Competition (LARC), @Home category.

2010–2012 **Technologist – Systems Analysis and Development**, *Faculdade Engenheiro Salvador Arena*, Sao Bernardo do Campo

- 2nd place – campus-wide programming Olympiad
- Teaching assistant – Advanced Programming

2008–2009 **Technician – Informatics**, *Etec Lauro Gomes*, Sao Bernardo do Campo

2007–2009 **High School**, *Etec Júlio de Mesquita*, Santo Andre

2007–2010 **English school**, *Wizard Idiomas*, Mauá
Best student of 2009.

Certifications

Coursera *Machine Learning – Stanford University* – **96%**

Coursera *Reinforcement Learning Fundamentals – University of Alberta & Alberta Machine Intelligence Institute* – **100%**

Coursera *Sample-based Learning Methods – University of Alberta & Alberta Machine Intelligence Institute* – **100%**

Coursera *Prediction and Control with Function Approximation – University of Alberta & Alberta Machine Intelligence Institute* – **100%**

Coursera *A Complete Reinforcement Learning System (Capstone) – University of Alberta & Alberta Machine Intelligence Institute* – **99.17%**

Coursera *Reinforcement Learning Specialization – University of Alberta & Alberta Machine Intelligence Institute*

Coursera *Natural Language Processing with Classification and Vector Spaces – DeepLearning.AI* – ***100%***

Coursera *Natural Language Processing with Probabilistic Models – DeepLearning.AI* – ***100%***

Coursera *Natural Language Processing with Sequence Models – DeepLearning.AI* – ***100%***

Coursera *Natural Language Processing with Attention Models – DeepLearning.AI* – ***100%***

Coursera *Natural Language Processing Specialization – DeepLearning.AI* – ***100%***

Microsoft *Microsoft Technology Associate: Software Development Fundamentals (C#)* – **96%**

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Fluency

Portuguese	Native speaker
English	Professional usage

Language Certifications

TOEIC *Listening and Reading* – **860 points** (max.: 990)

Computer Skills

Languages	Python (2013–Current) C# (2008–2011) Java (2010, 2016)
Operating systems	Ubuntu Linux (2013–2019) Manjaro Linux (2017–Current)
Cloud & Containerization	Docker (2021–Current) Azure (2021–Current) AWS Batch (2022–Current)
DBMS	PostgreSQL (2016, 2021–Current) Microsoft SQL Server (2011) Oracle (2011, 2014)
ML Frameworks	scikit-learn, PyTorch, TorchVision, pandas, timm, albumentations, PyTorch Lightning, Ray Tune

Open source contributions

I maintain multiple scientific packages in languages such as Python, R, LaTeX and C++, all available on my GitHub page `@douglasrizzo`.

Publications

B. d. J. Destro, D. D. R. Meneghetti, *Desenvolvimento de Um Sistema de Aplicação de Testes Informatizados Com Conteúdo Multimídia*, Trabalho de Conclusão de Curso, Faculdade de Tecnologia Termomecânica, São Bernardo do Campo, SP, **2012**.

D. D. R. Meneghetti, P. T. Aquino Junior, *Técnicas de Clustering Aplicadas a Testes Adaptativos Informatizados* in *Simpósio de Pesquisa Do Grande ABC*, São Bernardo do Campo, p. 2.

D. D. R. Meneghetti, *Metodologia de Seleção de Itens Em Testes Adaptativos Informatizados Baseada Em Agrupamento Por Similaridade*, Mestrado, Centro Universitário da FEI, **2015**.

A. de Souza Mendes, D. D. R. Meneghetti, M. Ackermann, A. de Toledo Fleury, *Vehicle Dynamics-Lateral: Open Source Simulation Package for MATLAB* in *SAE Technical Paper Series*, SAE International / SAE Technical Paper.

O. M. Alavarse, E. M. de Toledo Catalani, D. D. R. Meneghetti, R. Travitzki. Teste Adaptativo Informatizado Como Recurso Tecnológico Para Alfabetização Inicial. *Revista Iberoamericana de Sistemas, Cibernética e Informática* **2018**, *15*, 68–78.

R. Travitzki, D. D. R. Meneghetti, O. M. Alavarse, É. M. de Toledo Catalani, *How to Build a Computerized Adaptive Test with Free Software and Pedagogical Relevance?* in *International Academic Conference on Teaching, Learning and e-Learning*, 126, p. 117.

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D. D. R. Meneghetti, P. T. Aquino Junior. Application and Simulation of Computerized Adaptive Tests Through the Package Catsim. *arXiv:1707.03012 [stat]* **2018**.

P. T. Aquino Junior, B. d. F. V. Perez, D. De Rizzo Meneghetti, F. d. A. M. Pimentel, G. N. Marostica, J. G. R. Amorim, L. C. Neves, L. I. Gazignato, M. Y. Gonbata, R. M. de Souza, R. d. C. Techi, T. S. Meyer, V. S. d. M. Schmiedl, W. Yaguiu, *HERA: Home Environment Robot Assistant* in *II Brazilian Humanoid Robot Workshop (BRAHUR) and III Brazilian Workshop on Service Robotics (BRASERO)*.

J. H. R. de Oliveira, I. J. da Silva, T. P. D. Homem, D. D. R. Meneghetti, D. H. Perico, R. A. d. C. Bianchi, C. Reinaldo A., *Object Detection under Constrained Hardware Scenarios: A Comparative Study of Reduced Convolutional Network Architectures* in *2019 Latin American Robotics Symposium (LARS), 2019 Brazilian Symposium on Robotics (SBR) and 2019 Workshop on Robotics in Education (WRE)*, IEEE, Rio Grande, Brazil, pp. 25–30.

L. A. Ferreira, D. D. R. Meneghetti, P. E. Santos, *CAPTION: Correction by Analyses, POS -Tagging and Interpretation of Objects Using Only Nouns* in *First Annual International Workshop on Interpretability: Methodologies and Algorithms (IMA 2019)*, Adelaide, Australia.

Annotated Image Dataset of Household Objects from the RoboFEI@Home Team, **2020**.

D. D. R. Meneghetti, R. A. d. C. Bianchi, *Towards Heterogeneous Multi-Agent Reinforcement Learning with Graph Neural Networks* in *Anais Do Encontro Nacional de Inteligência Artificial e Computacional (ENIAC)*, SBC, Porto Alegre, RS, Brasil, pp. 579–590.

D. D. R. Meneghetti, T. P. D. Homem, J. H. R. de Oliveira, I. J. da Silva, D. H. Perico, R. A. d. C. Bianchi. Detecting Soccer Balls with Reduced Neural Networks: A Comparison of Multiple Architectures under Constrained Hardware Scenarios. *Journal of Intelligent & Robotic Systems* **2021**, *101*, 53.

D. D. R. Meneghetti, R. A. d. C. Bianchi, *Specializing Inter-Agent Communication in Heterogeneous Multi-Agent Reinforcement Learning Using Agent Class Information* in *AAAI-21 Workshop on Reinforcement Learning in Games*, Virtual Conference, p. 12.

L. A. Ferreira, D. D. R. Meneghetti, P. E. Santos, M. Lopes. CAPTION: Caption Analysis with Proposed Terms, Image's Objects and NLP. *Information Processing and Management* **2021**, 22.

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