



Alex Gaudio

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EDUCATION

Carnegie Mellon University

Ph.D. Candidate in Electrical Computer Engineering Aug 2018 – current
• Advisors: Professor Asim Smailagic and Professor Aurélio Campilho
• Thesis: Explainable Deep and Machine Learning for Medical Image Analysis

University of Porto, Faculdade de Engenharia

Ph.D. Candidate in Electrical Computer Engineering Aug 2018 – current
• Advisors: Professor Aurélio Campilho and Professor Asim Smailagic
• Fellowship awarded through the CMU Portugal Program for Dual Ph.D. Degrees

Carnegie Mellon University

Masters in Electrical Computer Engineering Aug 2018 – current
• Advisors: Professor Asim Smailagic and Professor Aurélio Campilho

Bard College

Bachelor of Arts in Music Aug 2006 – May 2010
• Award: Recipient of the Larry McLeod Award in Jazz.
• Thesis: Connecting With Others Through Jazz: Performances and All-Original Composition

JOURNAL PUBLICATIONS (PEER-REVIEWED)

* indicates equal contributions † indicates corresponding author(s)

- [1] **A. Gaudio**^{*}, A. Smailagic, C. Faloutsos, S. Mohan, E. Johnson, Y. Liu, P. Costa, and A. Campilho. “DeepFixCX: Explainable privacy-preserving image compression for medical image analysis”. In: *Wiley WIREs Data Mining and Knowledge Discovery* n/a.n/a (), e1495. DOI: <https://doi.org/10.1002/widm.1495>. eprint: <https://wires.onlinelibrary.wiley.com/doi/pdf/10.1002/widm.1495>. URL: <https://wires.onlinelibrary.wiley.com/doi/abs/10.1002/widm.1495>.
- [2] **A. Gaudio**^{*†}, C. Faloutsos, A. Smailagic, P. Costa, and A. Campilho. “ExplainFix: Explainable Spatially Fixed Deep Networks”. In: *Wiley WIREs Data Mining and Knowledge Discovery* 13.2 (2023), e1483. DOI: [10.1002/widm.1483](https://doi.org/10.1002/widm.1483). URL: <https://doi.org/10.1002/widm.1483>.
- [3] H. Montenegro^{*†}, W. Silva^{*}, **A. Gaudio**^{*}, M. Fredrikson, A. Smailagic, and J. S. Cardoso. “Privacy-Preserving Case-Based Explanations: Enabling Visual Interpretability by Protecting Privacy”. In: *IEEE Access* 10 (2022), pp. 28333–28347. URL: <https://doi.org/10.1109/ACCESS.2022.3157589>.
- [4] A. Smailagic^{*†}, P. Costa^{*}, **A. Gaudio**^{*}, K. Khandelwal, M. Mirshekari, J. Fagert, D. Walawalkar, S. Xu, A. Galdran, P. Zhang, A. Campilho, and H. Y. Noh. “O-MedAL: Online active deep learning for medical image analysis”. In: *Wiley WIREs Data Mining and Knowledge Discovery* 10.4 (Jan. 2020). DOI: [10.1002/widm.1353](https://doi.org/10.1002/widm.1353). URL: <https://doi.org/10.1002/widm.1353>.

CONFERENCE PUBLICATIONS (PEER-REVIEWED)

- [5] S. C. Pereira, J. Rocha, **A. Gaudio**, A. Smailagic, A. Campilho, and A. M. Mendonça. “Addressing Chest Radiograph Projection Bias in Deep Classification Models”. In: *Medical Imaging with Deep Learning*. 2023.
- [6] P. Costa^{*†}, **A. Gaudio**^{*}, A. Campilho, and J. S. Cardoso. “Explainable Weakly-Supervised Cell Segmentation by Canonical Shape Learning and Transformation”. In: *Medical Imaging with Deep Learning*. 2022. URL: <https://openreview.net/forum?id=k7JurYN0hQA>.

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- [7] **A. Gaudio**^{*}, M. Coimbra, A. Campilho, A. Smailagic, S. Schmidt^{*}, and F. Renna^{*†}. “Explainable Deep Learning for Non-Invasive Detection of Pulmonary Artery Hypertension from Heart Sounds”. In: *Computing in Cardiology Conference*. IEEE. 2022. URL: <https://cinc.org/2022/Program/accepted/295.html>.
 - [8] E. Johnson^{*}, S. Mohan^{*}, **A. Gaudio**^{*†}, A. Smailagic, C. Faloutsos, and A. Campilho. “HeartSpot: Privatized and Explainable Data Compression for Cardiomegaly Detection”. In: *IEEE-EMBS International Conference on Biomedical and Health Informatics (BHI)*. IEEE. Oct. 2022, pp. 01–04. URL: <https://doi.org/10.1109/BHI56158.2022.9926777>.
 - [9] **A. Gaudio**^{*†}, A. Smailagic, and A. Campilho. “Enhancement of Retinal Fundus Images via Pixel Color Amplification”. In: *International Conference on Image Analysis and Recognition*. Springer International Publishing, 2020, pp. 299–312. DOI: 10.1007/978-3-030-50516-5_26. URL: https://doi.org/10.1007/978-3-030-50516-5_26.
 - [10] A. Smailagic^{*}, A. Sharan^{*}, P. Costa[†], A. Galdran, **A. Gaudio**, and A. Campilho. “Learned Pre-processing for Automatic Diabetic Retinopathy Detection on Eye Fundus Images”. In: *International Conference on Image Analysis and Recognition*. Springer International Publishing, 2019, pp. 362–368. DOI: 10.1007/978-3-030-27272-2_32. URL: https://doi.org/10.1007/978-3-030-27272-2_32.
 - [11] Q. Xiao^{*}, J. Zou^{*}, M. Yang, **A. Gaudio**, K. Kitani, A. Smailagic[†], P. Costa, and M. Xu. “Improving Lesion Segmentation for Diabetic Retinopathy Using Adversarial Learning”. In: *International Conference on Image Analysis and Recognition*. Springer International Publishing, 2019, pp. 333–344. DOI: 10.1007/978-3-030-27272-2_29. URL: https://doi.org/10.1007/978-3-030-27272-2_29.

PATENTS

- [12] G. I. Kestenbaum^{*} and **A. Gaudio**^{*}. *Physical asset recognition platform*. U.S. Patent No. 10803542. Oct. 2020.

INVITED TALKS

- [13] **A. Gaudio**. *Addressing Private and Explainable AI via Compression*. Invited Speaker. Yale School of Medicine VAMOS Lab Seminar Series, Oct. 2022. URL: <https://docs.google.com/presentation/d/1ahgpzV6QEhmemYSt9zPAdl9It-U7t5-LIIRUyjkhDYE/edit?usp=sharing>.
- [14] **A. Gaudio**, I. Lynce, J. Magalhães, J. Mendonça, M. Casimiro, S. Brendão, and Z. Marinho. *Panel Discussion: Knowledge Creation and Talent Development under the CMU Portugal Program*. Invited Speaker. CMU Portugal Encontro Ciencia, May 2022. URL: <https://youtu.be/DMKc9t1I6VY?t=1374>.
- [15] **A. Gaudio**, B. Sanders, J. Magalhães, R. Santarromana, M. Andrada, S. Zejnilovic, and S. Brandão. *Panel Discussion: Roundtable on Talent Development*. Invited Speaker. CMU Portugal Summit 2022, Nov. 2022.
- [16] **A. Gaudio**. *ExplainFix: Explainable Spatially Fixed Deep Networks*. Invited Speaker. CMU Portugal Doctoral Symposium, 2021. URL: https://youtu.be/-_Zlkp82y_Y?t=10537.
- [17] **A. Gaudio**. *Balancing Infrastructure with Optimization and Problem Formulation*. Invited Speaker. Cornell Tech Data Science Hackathon, 2015. URL: https://www.youtube.com/watch?v=7FeKV46Us_0.
- [18] **A. Gaudio**. *Tmux + IPython = Awesome*. Invited Speaker. PyGotham, 2011. URL: <http://pyvideo.org/pygotham-2011/pygotham-2011--tmux---ipython---awesome.html>.

TEACHING

Fall 2021, Intro to Machine Learning (PhD Level), Teaching Assistant

- With Prof. Jaime Cardoso at FEUP, University of Porto, Portugal
- Three lectures, each three hours long, and weekly office hours. [slides1](#) [slides2](#) [slides3](#)

Spring 2022, Intro to Biomedical Engineering (Undergraduate Level), Teaching Assistant

- With Prof. Ana Maria Mendonça at FEUP, University of Porto, Portugal
- Two lectures, each one hour long. [slides](#)

INDUSTRY EXPERIENCE

NYC Makerspace: Co-Founder Feb 2017 – Oct 2020

- A non-profit establishing makerspaces throughout New York City. We provide advanced resources and education freely to the public, where learning and innovation is a form of recreation.
- Forged partnerships with Columbia University, Columbia Teacher's College and NYC Parks and Recreation.
- Taught three 12-week courses on robotics, programming, mathematics and 3D modeling to high school seniors.
- Established Harlem's first makerspace, and brought over \$17,000 to the space.
- Honored as a Champion of Social Justice by the Wilson Major Morris Community Center in Jan. 2018.

Columbia University, Creative Machines Lab (Prof. Hod Lipson)

- **Software Engineer: DARPA Transformative Design (TRADES) program** Nov 2017 – Jun 2018
– Mass-spring simulator for generative design of 3D models, an alternative to Finite Element Analysis.
- **Independent Research, advised by Prof. Hod Lipson** Dec 2016 – Jul 2017
– Multi-Agent Collaborative Learning simulator: MACL.

BuildingLink: Data Scientist Nov 2016 – Jul 2018

- **ImageR:** Machine Learning and Vision to solve matching problems, such as to connect images of packages to building residents. I designed and implemented the production ready algorithms, then coordinated development and release of the mobile apps for iOS and Android. ImageR processes 50K packages a day, 18 million packages processed by Jan. 2021, launched May 2018. Awarded Patent: 10,803,542

Alluvium: Senior Data Scientist, 1st employee Dec 2015 – May 2016

- Machine learning and IoT business that deploys intelligent autonomous agents close to sources of streaming data.

Sailthru: Senior Data Scientist and Engineer Aug 2012 – Nov 2015

- Inc. 5000's 30th fastest-growing company in the US in 2013. Subsequently acquired in 2019.
- Founded data science team, hired my boss, VP of Data Science Jeremy Stanley and grew team from 1 to 4 full time employees. Promotion to "Senior" in 2014.
- Created and launched **SightlinesTM** to predict user behavior, and architected a robust, fault tolerant and distributed data science platform.

Adaptly: Developer Dec 2011 – Jul 2012

Flat World Knowledge: Software Engineer, Backend Feb 2011 – Dec 2011

Bard College: Systems Engineer Jul 2009 – Sep 2010

Lawrence and Memorial Hospital: Emergency Room Technician (Level I) Jun 2008 – Aug 2008

NDP Emergency Medical Services: Emergency Medical Technician (EMT-B) Nov 2007 – Mar 2008

AWARDS

- **Dual PhD Degree Fellowship** from Carnegie Mellon University, Portugal Program Aug 2018
- **Champion of Social Justice** from the Wilson Major Morris Community Center in Harlem, NY Jan 2018
- **Larry McLeod Award in Jazz** from Bard College May 2010