



# Alex Gaudio

Email: [adgaudio@gmail.com](mailto:adgaudio@gmail.com)  
Website: [alexgaudio.com](http://alexgaudio.com)  
GitHub: [github.com/adgaudio](https://github.com/adgaudio)  
LinkedIn: [linkedin.com/in/adgaudio](https://linkedin.com/in/adgaudio)

## EDUCATION

### Carnegie Mellon University

- Ph.D. Candidate in Electrical Computer Engineering** Aug 2018 – current
- Advisors: Professor Asim Smailagic and Professor Aurelio 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 Aurelio 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 Aurelio 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**<sup>\*</sup>, 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**<sup>\*†</sup>, 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<sup>\*†</sup>, W. Silva<sup>\*</sup>, **A. Gaudio**<sup>\*</sup>, 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<sup>\*†</sup>, P. Costa<sup>\*</sup>, **A. Gaudio**<sup>\*</sup>, 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] P. Costa<sup>\*†</sup>, **A. Gaudio**<sup>\*</sup>, 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>.
- [6] **A. Gaudio**<sup>\*</sup>, M. Coimbra, A. Campilho, A. Smailagic, S. Schmidt<sup>\*</sup>, and F. Renna<sup>\*†</sup>. “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>.

- 
- [7] E. Johnson\*, S. Mohan\*, **A. Gaudio**<sup>\*†</sup>, 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>.
  - [8] **A. Gaudio**<sup>\*†</sup>, 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](https://doi.org/10.1007/978-3-030-50516-5_26).
  - [9] A. Smailagic\*, A. Sharan\*, P. Costa<sup>†</sup>, 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](https://doi.org/10.1007/978-3-030-27272-2_32).
  - [10] Q. Xiao\*, J. Zou\*, M. Yang, **A. Gaudio**, K. Kitani, A. Smailagic<sup>†</sup>, 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](https://doi.org/10.1007/978-3-030-27272-2_29).

## PATENTS

- [11] G. I. Kestenbaum\* and **A. Gaudio**\*. *Physical asset recognition platform*. U.S. Patent No. 10803542. Oct. 2020.

## INVITED TALKS

- [12] **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/1ahgpzV6QEHmemYSt9zPAd19It-U7t5-LIIRUyjkhDYE/edit?usp=sharing>.
- [13] **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>.
- [14] **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.
- [15] **A. Gaudio**. *ExplainFix: Explainable Spatially Fixed Deep Networks*. Invited Speaker. CMU Portugal Doctoral Symposium, 2021. URL: [https://youtu.be/-\\_Zlkp82y\\_Y?t=10537](https://youtu.be/-_Zlkp82y_Y?t=10537).
- [16] **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](https://www.youtube.com/watch?v=7FeKV46Us_0).
- [17] **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 Mendonca 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 30<sup>th</sup> 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 **Sightlines™** 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

- **Champion of Social Justice** by the Wilson Major Morris Community Center Jan 2018
- **Larry McLeod Award in Jazz** by Bard College May 2010