Guillaume Jaume, P.hD.

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SUMMARY

Third-year post-doctoral researcher at **Harvard Medical School** and **Brigham and Women's Hospital** with seven years of industry and academic experience working in computer vision, computational pathology, and AI. My work tries to understand ***How can we develop generalist AI models for pathology, biology, and oncology?***, and ***How can we leverage these models for diagnosis, prognosis, and biomarker discovery?***. I am now seeking a new **full-time position** to keep advancing the field into high-impact research and products.

WORK EXPERIENCE

- **Harvard Medical School, Boston, United States** *May 2022 –*
  Post-doctoral research fellow, Mahmood Lab – Brigham and Women's Hospital
  Focus: AI for pathology: foundation models, cancer diagnosis and prognosis, drug safety
  Collaborators: MIT, CMU, ETH, EPFL, University of Edinburgh
- **IBM Research, Zurich, Switzerland** *Dec 2017 - Feb 2022*
  Pre-doctoral researcher in the Cognitive Healthcare & Life Sciences group
  Focus: Computational pathology, Graph representation learning
  Collaborators: ETH, Mayo Clinic, CHUV, University Hospital of Zurich, University Hospital of Paris
- **EPFL, Lausanne, Switzerland** *2013 - 2016*
  Teaching Assistant for multiple bachelor and master courses
  Focus: Supervise students in practicals, projects, and labs
- **CERN, Geneva, Switzerland** *June 2015 - Aug 2015*
  CERN Summer Student Program, High-Luminosity Large Hadron Collider
  Team: High-Luminosity Large Hadron Collider

EDUCATION

- **Ph.D. in Electrical Engineering** *Jan 2018 - Jan 2022*
  EPFL, Lausanne, Switzerland
  Thesis: Graph Representation Learning in Computational Pathology
  Advisors: Prof. Jean-Philippe Thiran; Dr. Maria Gabrani
- **Special student in Computer Science** *Jan 2018 - Jan 2021*
  ETH, Zurich, Switzerland
- **M.Sc. in Electrical Engineering** *Sep 2015 - Sep 2017*
  EPFL, Lausanne, Switzerland
  Thesis: A Cognitive Solution to Extract and Understand Information in Medical Forms
- **Erasmus exchange, Electrical & Computer Engineering** *Sep 2014 - June 2015*
  Heriot-Watt University, Edinburgh, United Kingdom
- **B.Sc. in Electrical Engineering** *Sep 2012 - June 2015*
  EPFL, Lausanne, Switzerland

SELECTED PUBLICATIONS

Most important publications are underlined.

Journals:

- A. Song et al., "Analysis of 3D pathology samples using weakly supervised AI," **Cell**, 2024
- A. Vaidya et al., "Examining Demographic Bias in Misdiagnosis by AI-Driven Computational Pathology Models," **Nature Medicine**, 2024
- M. Lu et al., "A Visual-Language Foundation Model for Computational Pathology," **Nature Medicine**, 2024
- R. Chen et al., "Towards a General-Purpose Foundation Model for Computational Pathology," **Nature Medicine**, 2024
- **G. Jaume**[*] et al., "Artificial Intelligence for Computational and Digital Pathology," **Nature Reviews Bioengineering**, 2023
- **G. Jaume**[*] et al., "Weakly Supervised Learning for Joint Whole-Slide Segmentation and Classification in Prostate Cancer," **Medical Image Analysis**, 2023
- **G. Jaume**[*] et al., "Hierarchical Graph Representations in Digital Pathology," **Medical Image Analysis**, 2021

In review:

- **G. Jaume**[*] et al., "Molecular-Driven Foundation Model for Pathology," 2025 [Journal]
- T. Ding et al., "Multimodal Whole Slide Foundation Model for Pathology," 2025 [Journal]
- **G. Jaume** et al., "Deep Learning-based Modeling for Preclinical Drug Safety Assessment," 2024 [Journal]
- **G. Jaume**[*] et al., "AI-driven Discovery of Morphomolecular Signatures in Toxicology," 2024 [Journal]

Peer-reviewed conferences:

- **G. Jaume**[*] et al., "HEST-1k: A Dataset Integrating Spatial Transcriptomics and Histology Image Analysis," **NeurIPS, Spotlight (Top 2% of submissions)**, 2024
- **G. Jaume**[*] et al., "Multistain Pretraining for Slide Representation Learning in Pathology," **ECCV**, 2024
- A. Song et al., "Multimodal Prototyping for cancer survival prediction," **ICML**, 2024
- **G. Jaume**[*] et al., "Transcriptomics-guided Slide Representation Learning in Computational Pathology," **CVPR, Oral (Top 0.7% of submissions)**, 2024
- **G. Jaume**[*] et al., "Modeling Dense Multimodal Interactions Between Biological Pathways and Histology for Survival Prediction," **CVPR**, 2024
- A. Song et al., "Morphological Prototyping for Unsupervised Slide Representation Learning in Computational Pathology," **CVPR**, 2024
- K. Thandiackal et al., "Differentiable Zooming for Multiple Instance Learning on Whole-Slide Images," **ECCV**, 2022
- **G. Jaume**[*] et al., "Quantifying Explainers of Graph Neural Networks in Computational Pathology," **CVPR**, 2021
- **G. Jaume**[*] et al., "Learning Whole-Slide Segmentation from Inexact and Incomplete Labels using Tissue Graphs," **MICCAI**, 2021

[*]denotes co-first authorship

AWARDS

- Nominated for the EPFL Doctorate Award *Jan 2022*
- IBM Outstanding Technical Achievement and Innovation Award *May 2021*
  "Intelligent and quantitative immunostaining of tumor tissue sections"
- IBM First Invention Plateau *June 2021*
- **Best Paper Awards:**
  - MICCAI, Computational Pathology (COMPAY) Workshop *Sep 2021*
  - MICCAI, Graphs in Biomedical Image Analysis Workshop *Oct 2020*
  - ICML, Computational Biology Workshop *July 2020*

TEACHING

- **Teaching Assistant:**
  - Circuits and Systems II – EE-205, EPFL *Spring 2016*
  - Circuits and Systems I – EE-111, EPFL *Fall 2015* & *Fall 2016*
  - Advanced Wireless Receivers – EE-543, EPFL *Spring 2016*
  - Wireless Receivers – EE-442, EPFL *Fall 2015*
  - Object-Oriented Programming – COM-112, EPFL *Spring 2014*
  - Introduction to Programming, EPFL *Fall 2013*
- **Lecturer:**
  - Introduction to Computational Pathology – 6.S915, MIT, *Boston* *Jan 2024*
  - AI4Health Summer School, *Paris* *July 2023*
  - Applied Machine Learning Days (AMLD), *Lausanne* *April 2021*

RESEARCH FUNDING & GRANTS

Please reach out for information regarding funding and grants.

SOFTWARE & DATASETS

Collectively, all my research projects have garnered over 2,500 GitHub stars, dataset contributions accessed more than 300,000 times, and pretrained models downloaded over 1 million times.

- **Trident**: Reference library for histology image processing with integration of 20+ foundation models [Code]
- **Patho-Bench**: Largest public benchmark for pathology with 42 curated tasks [Code]
- **HEST-1k**: The largest collection of spatial transcriptomics paired with H&E whole-slide images and metadata (>200,000 downloads) [Code & Data]
- **HistoCartography**: A collection of image-to-graph translation and state-of-the-art graph algorithms for facilitating interpretable entity-based analysis in digital pathology (>250 GitHub stars) [Code]
- **BR**e**A**st **C**arcinoma **S**ubtyping (**BRACS**): A large cohort of H&E stained histopathological images for automated breast cancer diagnosis [Website]
- **FUNSD**: A dataset for Form Understanding in Noisy Scanned Documents [Website]

COMMUNITY OUTREACH

- **Reviewer:**
  - *Journals:* Nature Communications, IEEE Transactions on Medical Imaging, Science Translational Medicine, Medical Image Analysis, British Journal of Cancer, GigaScience, NPJ Precision Oncology, NPJ Breast Cancer
  - *AI/CV Conferences:* CVPR, ECCV, MICCAI
- **Thesis committee:**
  - Michail Chatzizacharias, INSERM *Paris* *Nov 2024*
    "AI-based approaches for the prediction of response for the therapy of HCC and NET tumors"
- **Workshop co-organizer:**
  - IEEE International Symposium on Biomedical Imaging (ISBI), *Kolkata* *March 2022*
    "BRIGHT: BReast tumor Image classification on Gigapixel HisTopathological images"
  - American Medical Informatics Association (AMIA), *San Diego* *Nov 2021*
    "Workshop on Explainable Multimodal AI in Cancer Patient Care"
- **Selected talks:**
  - Novartis – Invited by the Digital Pathology and Image Analysis Interest Group *March 2024*
    "AI for Computational Toxicologic Pathology"
  - University of Sydney – Invited by SPDS Statistical Bioinformatics Seminar *March 2024*
    "Bringing Spatial Transcriptomics into The World of Deep Learning"
  - Owkin, *Paris* – Invited by Alexandre Filliot *Dec 2024*
    "Scaling Spatial Transcriptomics and Histology with HEST"
  - Roche, *Basel* – Invited by Dr. Kevin Thandiackal *Nov 2024*
    "AI for Preclinical Drug Safety Assessment"
  - Lunit, *Seoul* – Invited by Dr. Sergio Pereira *Sep 2024*
    "Multimodal Representation Learning in AI for Pathology"
  - UniBe, *Bern* – Invited by Prof. Inti Zlobek *May 2024*
    "3D Computational Pathology: Towards Enhanced Patient Prognostication"
  - CHUV, *Lausanne* – Invited by Prof. Raphael Gottardo *May 2024*
    "Towards General-Purpose AI Models for Histology"
  - PariSanté Campus, *Paris* – Keynote speaker, AI4Health Summer School *July 2023*
    "Deep Learning for Pathology Image Analysis"
  - UC Berkeley, *Berkeley* – Invited by Prof. Iain Carmichael *Nov 2022*
    "A Tour of Computational Pathology: Methods and Applications"
  - Dana-Farber Cancer Institute, *Boston* – Invited by Prof. Eliezer Van Allen *Sep 2022*
    "Interpretable Deep Learning in Computational Pathology"
  - Tissue Image Analytics Centre, *Warwick* – Invited by Prof. Nasir Rajpoot *Oct 2021*
    "HistoCartography: Graph representations and models in Computational Pathology"
  - Charité University Hospital, *Berlin* *Oct 2021*
    "Graph Representations and Models in Digital Pathology"
  - PathAI, *New York* *July 2021*
    "Weakly-Supervised Learning for Whole-Slide-Image Segmentation"
  - Swiss Digital Pathology Consortium (SDiPath), *Bern* *Jan 2021*
    "Graph Representation Learning & Explainability in Computational Pathology"
  - Computer Research Institute of Montreal (CRIM), *Montreal* *Nov 2020*
    "Deep Learning on Graphs: An Overview"

STUDENT SUPERVISION

- Anurag Vaidya, *Grad student – Harvard-MIT HST Program* *2023 –*
  Representation Learning in Histology
- Andrew Zhang, *Grad student – Harvard-MIT HST Program* *2023 –*
  Multimodal Modeling in Pathology
- Harry Robertson, *PhD internship – University of Sydney* *Fall 2024*
  "Agentic AI for Renal Allograft Biopsy Assessment"
- Lucia Pancorbo Fernandez, *Master's thesis – ETH Zurich* *Fall 2024*
  "Revisiting Panoptic Segmentation in Computational Pathology"
- Isabella Polles, *PhD internship – Politecnico Milano* *Spring 2024*
  "Expression-guided Representation Learning of Histology Images"
- Paul Doucet, *Master's thesis –ETH Zurich* *Spring 2024*
  "A Dataset for Pan-tissue Morphological and Molecular Analysis"
- Thomas Peeters, *Master's thesis – EPFL* *Spring 2023*
  "Understanding Morphomolecular Signatures in Drug Safety Studies"
- Lukas Oldenburg, *Master's thesis – RWTH Aachen University* *2023*
  "Combining Transcriptomics and Histology in Computational Toxicologic Pathology"
- Imaad Zaafar, *Summer internship – UCL* *Summer 2022*
  "Embedding Space Augmentation with Generative Models"
- Valentin Anklin, *Master's thesis – ETH Zurich* *Autumn 2020*
  "Learning Segmentation in Histology from Inexact and Incomplete Labels using GNNs"
- Lauren Alisha Fernandez, *Master's thesis – ETH Zurich* *Autumn 2019*
  "Cell-graph Networks for Representation and Grading of Histopathology Images"
- Atul Kumar, *Master's thesis – EPFL* *Autumn 2019*
  "Learning to generate Scene Graphs from Images and vice-versa"
- Martin Svatos, *Research internship – Uni Prague* *Spring 2019*
  "Mind the Logit Gap: Incomparable Tasks in Continual Learning"
- Maria Halushko, *Research internship – Uni Kyiv* *Autumn 2018*
  "Text Detection in Noisy Scanned Documents"

PATENTS

- F. Mahmood, **G. Jaume**, "Novel Computational Models For Drug Toxicity Assessment", 2024
- A. Foncubierta-Rodriguez, P. Pati, **G. Jaume**, K. Thandiackal, "Processing multimodal images of tissue for medical evaluation," 2022
- P. Pati, **G. Jaume**, K. Thandiackal, A. Foncubierta-Rodriguez, M. Gabrani, "Registration Free Multimodal Digital Pathology," 2021
- P. Pati, **G. Jaume**, A. Foncubierta-Rodriguez, M. Gabrani, "Interpretation of whole-slide images in digital pathology," 2021
- **G. Jaume**, A. Foncubierta-Rodriguez, M. Gabrani, "Extracting structured information from a document containing filled form images," 2019
- **G. Jaume**, A. Foncubierta-Rodriguez, M. Gabrani, "Method and system for extracting information from an image of a filled form document," 2019