

GIANMARCO JHAIR GALLARDO CALLALLI

Imaging Science PhD Candidate @ RIT

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OVERVIEW

My current research focuses on **robust, brain-inspired continual self-supervised learning** for computer vision, with an emphasis on **representation learning and generalization behavior**. Previously, through two internships at Siemens Healthineers, I developed 3D vision models on **chest CT** for lung nodule detection, classification and organ tasks (segmentation/classification), including **self-supervised pretraining** for transfer across downstream applications. My broader work spans self-supervised learning, continual learning, and model robustness, with publications in ICML, NeurIPS, TMLR, and BMVC.

EDUCATION

Ph.D. in Imaging Science, **Rochester Institute of Technology** 🗓 August 2019 – Expected: May 2026

Rochester, New York

- **Research focus:** Brain-inspired continual self-supervised learning for computer vision
- **Relevant coursework:** Deep Learning for Vision, Human Visual System, Image Processing, and Computer Vision.
- **Highlights:** 7+ publications (ICML, NeurIPS, TMLR, BMVC, etc.)

B.Sc. in Mechatronics Engineering, **Universidad Nacional de Ingeniería** 🗓 March 2011 – December 2015

Lima, Peru

- **Relevant coursework:** Machine Learning, Image Processing, Object-Oriented Programming, Research Methodology
- **Highlights:** 2 publications

EXPERIENCE

Research Intern, **Siemens Healthineers** 🗓 August 2023 – November 2023 🇺🇸 Malvern, Pennsylvania

- Designed and implemented 3D MAE-style **self-supervised pretraining** for **chest CT** volumes, producing a **pretrained transformer backbone** transferable across downstream tasks including **organ classification**, **organ segmentation**, and **lung nodule detection**.
- Improved downstream iteration efficiency (**up to 1000× fewer iterations**) for a transformer-based 3D lung nodule detection pipeline via effective pretraining and transfer.

Technologies used: Python, PyTorch, MONAI, Azure AI ML, 3D chest CT (MHD) data

Data Scientist, **NTT DATA Europe & Latam** 🗓 May 2018 – July 2019 🇲🇽 Lima, Peru

- Built a **large-scale recommendation system** using neural collaborative filtering for 1.5M clients and 150K items.
- Implemented **multi-object tracking for indoor analytics** using Deep SORT (detection + re-identification) to estimate office space usage patterns from video streams.
- Created a real-time cosmetic product recognition app for mobile devices using MobileNet (96% accuracy).
- Developed and evaluated CNN systems for visual classification (e.g., vehicle damage severity) and packaged demos for stakeholder review.

Technologies used: Python, PyTorch, Keras, TensorFlow Lite, OpenCV, Librosa, Docker, Flask, PySpark, DVC, Git, GitHub

Research Intern, **Siemens Healthineers** 🗓 April 2017 – March 2018 🇺🇸 Malvern, Pennsylvania

- Designed a **3D CNN** for **lung nodule classification** on **chest CT** volumes, improving sensitivity to **90%** while halving false positives (**1.45 FP/patient**).
- Developed an annotation tool to correctly tag lung nodule images for training and evaluation.
- Summarized and presented current machine learning state-of-the-art work in internal reading groups.

Technologies used: Python, Caffe, SimpleITK, Tkinter, 3D chest CT (MHD) data

Research Assistant, **Universidad Nacional de Ingeniería (UNI)** 🗓 July 2016 – March 2017 🇲🇽 Lima, Peru

- Developed a **CNN** for **diabetic retinopathy detection** from retinal fundus images, achieving **83% accuracy**.

Technologies used: Python, Keras, OpenCV

Software Tester (QA), International Business Machines (IBM) April 2016 – October 2016 Lima, Peru

- Executed QA/testing strategies for a telecom database system and built a face recognition prototype using IBM Watson services.

Technologies used: Python, SQL, OpenCV, Watson visual recognition

TECHNICAL SKILLS

- Deep Learning:** Transformers, CNNs, self-supervised learning (foundation-style pretraining), representation learning, transfer learning, continual learning, model robustness/reliability (OOD), interpretability basics (e.g., attention visualization, Grad-CAM), DistributedDataParallel (DDP), mixed precision (AMP), multi-GPU training
- Computer Vision:** image recognition, object detection, segmentation, multi-object tracking basics, image processing, feature extraction
- Software & Tools:** Python, PyTorch, MONAI, Continuum, scikit-learn, Git, Bash, LaTeX, Azure ML, Docker, DVC, Weights & Biases, TensorBoard
- Operating Systems:** Linux, Windows

PEER-REVIEWED PUBLICATIONS

- M.Y. Harun, **J. Gallardo**, and C. Kanan. Controlling Neural Collapse Enhances Out-of-Distribution Detection and Transfer Learning. In: *International Conference on Machine Learning (ICML)*, 2025 [Link](#)
- M.Y. Harun, K. Lee, **J. Gallardo**, G. Krishnan, and C. Kanan. What Variables Affect Out-Of-Distribution Generalization in Pretrained Models?. In: *Conference on Neural Information Processing Systems (NeurIPS)*, 2024 [Link](#)
- J. Gallardo**, C. Savur, F. Sahin, and C. Kanan. Human Emotion Estimation through Physiological Data with Neural Networks. In: *System of Systems Engineering Conference (SoSE)*, 2024
- M.Y. Harun, **J. Gallardo**, and C. Kanan. GRASP: A Rehearsal Policy for Efficient Online Continual Learning. In: *Conference on Lifelong Learning Agents (CoLLAs)*, 2024 [Link](#)
- M.Y. Harun*, **J. Gallardo***, T.L. Hayes, R. Kemker, and C. Kanan. SIESTA: Efficient online continual learning with sleep. In: *Transactions on Machine Learning Research (TMLR)*, 2023 [CoLLAs-2024 Event Certified] [Link](#)
- Md Y. Harun, **J. Gallardo**, T.L. Hayes, and C. Kanan. How Efficient Are Today's Continual Learning Algorithms?. In: *CVPR Workshop on Continual Learning in Computer Vision (CLVISION)*, 2023 [Link](#)
- I. Sur, Z. Daniels, A. Rahman, K. Faber, **J. Gallardo**, T.L. Hayes, C.E. Taylor, M.B. Gurbuz, J. Smith, S. Joshi, N. Japkowicz, M. Baron, Z. Kira, C. Kanan, R. Corizzo, A. Divakaran, M. Piacentino, J. Hostetler, and A. Raghavan. System design for an integrated lifelong reinforcement learning agent for real-time strategy games. In: *International Conference on AI-ML Systems*, 2022 [Link](#)
- J. Gallardo**, T.L. Hayes, and C. Kanan. Self-supervised training enhances online continual learning. In: *British Machine Vision Conference (BMVC)*, 2021 [Link](#)
- G. García, **J. Gallardo**, A. Mauricio, J. López, and C. Del Carpio. Detection of diabetic retinopathy based on a convolutional neural network using retinal fundus images. In: *Artificial Neural Networks and Machine Learning (ICANN)*, 2017 [Link](#)
- A. Mauricio, A. Nieves, Y. Castillo, K. Hilasaca, C. Fonseca, **J. Gallardo**, R. Rodríguez, and G. Rodríguez. Multi-robot exploration and mapping strategy in underground mines by behavior control. In: *International Symposium on Multibody Systems and Mechatronics (MUSME)*, 2014 [Link](#)

* Equal contribution

PEER-REVIEWED ABSTRACTS & POSTERS

- M.Y. Harun, K. Lee, **J. Gallardo**, G. Krishnan, and C. Kanan. What Variables Affect Out-of-Distribution Generalization in Pretrained Models? In: *ICML Workshop on Unifying Data Curation Frameworks Across Domains (DataWorld)*, 2025
- M.Y. Harun, K. Lee, **J. Gallardo**, G. Krishnan, and C. Kanan. Disentangling the Causes of the Tunnel Effect in Deep Neural Networks. In: *IEEE Western NY Image & Signal Processing Workshop (WNYISPW)*, 2024 (Oral)
- M.Y. Harun, **J. Gallardo**, and C. Kanan. Prioritized Training on Rehearsal Samples for Efficient Online Continual Learning. In: *IEEE Western NY Image & Signal Processing Workshop (WNYISPW)*, 2023 (Oral)
- J. Gallardo**, T.L. Hayes, and C. Kanan. Self-supervised training enhances online continual learning. In: *IEEE Western NY Image & Signal Processing Workshop (WNYISPW)*, 2021

TEACHING EXPERIENCE

- Teaching Assistant, Image Processing and Computer Vision II – RIT (Spring 2020)
Assisted with labs, assignments, and student support in advanced computer vision topics.

- Teaching Assistant, Imaging Science Fundamentals – RIT (Fall 2019)
Supported undergraduate instruction in core imaging science principles.

REVIEWER

- AAAI Conference on Artificial Intelligence (AAAI): 2025, 2026
- Computer Vision and Pattern Recognition Conference (CVPR): 2024, 2025
- Conference on Lifelong Learning Agents (CoLLAs): 2025
- International Conference on Computer Vision (ICCV): 2025
- Winter Conference on Applications of Computer Vision (WACV): 2026
- Workshop on Continual Learning in Computer Vision (CLVISION): 2024, 2025

HONORS & AWARDS

- **Invited Speaker:** Self-supervised and continual learning talk at Center for Human-Aware AI Seminars, RIT (2022)
- **Guest Speaker:** Continual-AI Reading Group – Presented paper on self-supervised online continual learning (2021)
- **Webinar Speaker:** Computer Vision at NTT DATA Europe & Latam (2018)
- **Research Grant Recipient:** Funded by UNI for diabetic retinopathy detection project (2016)
- **Student Leader:** President, Artificial Intelligence and Control Systems Research Group (GISCIA), UNI (2016)

LANGUAGES

- **English:** Fluent
- **Spanish:** Native

REFERENCES

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