GIANMARCO JHAIR GALLARDO CALLALLI

Imaging Science PhD Candidate @ RIT

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OVERVIEW

My research focuses on **self-supervised and continual learning for computer vision**, with a particular interest in building efficient, minimally supervised representation learning systems. Previously, I interned at **Siemens Healthineers**, where I developed **self-supervised methods for 3D medical image analysis**. Published in ICML, NeurIPS, TMLR, and BMVC.
Research Interests: Self-Supervised Learning, Continual Learning, Computer Vision, Deep Learning, Medical Imaging

EDUCATION

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

Rochester, New York

- **Advisor**: Dr. Christopher Kanan
- **Research focus**: Self-supervised and continual learning for computer vision
- **Relevant course work**: Deep Learning for Vision, Human Visual System, Image Processing, and Computer Vision.
- **Highlights**: 7+ publications

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

Lima, Peru

- **Relevant course work**: 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 masked autoencoder-based self-supervised pretraining for 3D organ classification, segmentation, and lung nodule detection.
- Achieved a 1000× reduction in training iterations for a transformer-based 3D lung nodule detector via effective pretraining strategies.

Technologies used: Python, PyTorch, MONAI, Azure AI ML

Data Scientist, NTT DATA Europe & Latam May 2018 – July 2019 Lima, Peru

- Developed a vehicle damage severity classification system using CNNs and deployed a demo.
- Built a large-scale recommendation system using neural collaborative filtering for 1.5M clients and 150K items.
- Created a real-time cosmetic product recognition app for mobile devices using MobileNet (96% accuracy).
- Trained an audio emotion classifier on spectrograms, achieving 70% accuracy.

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 CT scans, improving sensitivity to 90% while halving false positives (1.45 FP/patient).
- Developed an annotation tool to correctly tag lung nodule images.
- Summarized and presented current machine learning state-of-the-art works in reading groups.

Technologies used: Python, Caffe, SimpleITK, Tkinter, CT scan data

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

- Developed a convolutional neural network for diabetic retinopathy detection from retinal images (83% accuracy).

Technologies used: Python, Keras, OpenCV

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

- Executed QA and testing strategies for a telco database system. Developed a face recognition prototype using IBM Watson services.

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

TECHNICAL SKILLS

- **Programming Languages**: Python
- **Deep Learning Libraries**: PyTorch, MONAI, Continuum
- **Scientific Computing**: Numpy, Scikit-learn, Pandas
- **Tools & Platforms**: Git, Bash, LaTeX, Azure ML, Docker, DVC, WandB, TensorBoard
- **Operating Systems**: Linux, Windows

PEER-REVIEWED PUBLICATIONS

1. 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
2. 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
3. **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
4. 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
5. 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
6. 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
7. 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
8. **J. Gallardo**, T.L. Hayes, and C. Kanan. Self-supervised training enhances online continual learning. *In: British Machine Vision Conference (**BMVC**)*, 2021 Link
9. 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
10. 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

1. 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
2. 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)
3. 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)
4. **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

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)

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

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

LANGUAGES

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