Itamar Franco **Salazar Reque**

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Summary

Currently working at the Medical Image Laboratory (LIM) from PUCP exploring robust methods for ultrasound image formation with deep learning. Former researcher in the group of Signal Processing and Artificial Intelligence at INICTEL-UNI where we applied machine learning and signal & image processing techniques in agricultural and biomedical projects.

Former intern in the Signal Processing Laboratory (LTS4) at EPFL studying the inductive bias of deep neural networks (DNN) using concepts from signals and systems. I have teaching experience in signal processing and AI-related courses. During my master, I studied the inverse problem for electroencephalographic signals and for my undergrad thesis I explored machine learning algorithms to automatically detect diseased areas on plant leaves.

My current interest are the application of DNN for ultrasound image formation and the study of its robustness.

Education

Pontificia Universidad Catolica del Peru — *Lima, Perú*

PhD, Engineering (Ongoing)

- Exploring robust methods for ultrasound image reconstruction using deep learning with the supervision of Roberto Lavarello.
- With scholarship from peruvian government

Universidad Nacional de Ingenieria — *Lima, Perú*

Master of Science, Electronic Engineer

- Research on the performance of EEG inverse techniques when varying electrode numbers and noise
- Under the supervision of Carlos Mugruza
- With scholarship from peruvian government

Universidad Nacional de Ingenieria — *Lima, Perú*

Bachelor of science, Telecommunication Engineering

- Placed first in graduating class

Experience

PUCP — *Lima, Peru*

Teacher assistant — *Aug., 2022 - Present*

- Digital Signal Processing

INICTEL-UNI — *Lima, Perú*

Specialized researcher in technological development, Collaborator — *2018 - 2022*

- Avocado tree analysis using images acquired via drones. [Code][About the project]
- Amplifying the small movements a person makes when breathing.[Code] [About the project]
- App to automatically identify avocado diseases from digital images. [About the project]
- Satellite image processing to calculate evapotranspiration. [About the project]]

EPFL — *Lausanne, Switzerland*

Research Intern — *Oct., 2020 - March, 2021*

- Studying the inductive bias of Deep Neural Networks under the direction of Pascal Frossard
- With scholarship from the peruvian government.

Universities — *Lima, Perú*

Lecturer — *March, 2019 - 2022*

- Signals and Systems - Universidad Peruana de Ciencias Aplicadas: 04/2020 - 03/2022
- Multilayer Perceptrons and introduction to Fuzzy Logic - Universidad Tecnológica del Perú: 06/2019-03/2020
- Signals and Systems - Universidad Nacional Tecnológica de Lima Sur: 03/2019 - 06/2019

NYIT — *New York, U.S.A*

Visiting Research Fellow — *Oct., 2017 - Dec., 2017*

- Studying CPA algorithm and methods to process functional imaging of olfactory bulb responses
- Under the direction of Gonzalo Otazu.

PERU MENU — *Lima, Peru*

Developer — *July, 2012 - Sept., 2012*

- An app to find restaurants near to you.

Precursores de la Independencia Nacional (Secondary School) *Lima, Peru*

Teaching to best students *July, 2010 - Sept., 2010*

- Teaching arithmetic to top-10 students from first secondary year.

Contributions

[1]	**Salazar-Reque, I.F.**, Lavarello, R., "Robustness of an ultrasound deep beamformer to low-energy input perturbations in worst-case performance", 2022	*Unpublished*
[2]	**Salazar-Reque, I.F.**, D. Arteaga, K. G. Huamán and S. Huamán Bustamante, "A CNN-based algorithm for selecting tree-of-interest images acquired by UAV," 2021 IEEE International Conference on Machine Learning and Applied Network Technologies (ICMLANT), 2021, pp. 1-6, doi: 10.1109/ICMLANT53170.2021.9690556.	*Conference*
[3]	Ortiz-Jimenez, G., **Salazar-Reque, I.F.**, Apostolos Modas, Seyed-Mohsen Moosavi-Dezfooli, Pascal Frossard. A neural anisotropic view of underspecification in deep learning. In: Robust and Reliable Machine Learning in the Real World Workshop at International Conference on Learning Representations (ICLR 2021)	*Workshop*
[4]	**Salazar-Reque, I.F.**, Otazu G., Huaman S. (2020) Replacing FC layers in a CNN could improve robustness against adversarial attacks. CIFAR DLRL Summer School (available under request)	*Poster*
[5]	**Salazar-Reque, I.F.**, Huaman, S. Automatic Leaf Segmentation from Images Taken Under Uncontrolled Conditions Using Convolutional Neural Networks. In: Brazilian Technology Symposium'19 – Perú 2019 (BTSym 2019), **DOI:** 10.1007/978-3-030-57566-3_27	*Conference*
[6]	Morales, G., **Salazar-Reque, I.F.**, Telles, J., Díaz, D. Detecting Violent Robberies in CCTV Videos Using Deep Learning. In: 15th International Conference on Artificial Intelligence Applications and Innovations (AIAI 2019), **DOI:** 10.1007/978-3-030-19826-7	*Conference*
[7]	**Salazar-Reque, I.F.**, Pacheco, A.G., Rodriguez, R. Y., Lezama, J., and Huaman, S. An image processing method to automatically identify Avocado leaf state. In: XXII Symposium on Image, Signal Processing and Artificial Vision (STSIVA 2019). **DOI:** 10.1109/STSIVA.2019.8730218	*Conference*
[8]	**Salazar-Reque, I.F.**, Kemper G., Huamán S. G. H., Telles J. and Diaz D.,(2019). An Algorithm for Plant Disease Visual Symptom Detection in Digital Images based on Superpixels. International Journal on Advanced Science, Engineering and Information Technology, 9(1), pp. 194-203, **DOI:** 10.18517/ijaseit.9.1.5322	*Journal*

Skills

Programming	Python, MATLAB. Legacy: C++, Qt, Java, HTML
DL Frameworks	PyTorch, Keras, TensorFlow
Languages	English (100/120 - TOEFL iBT), French (basic), Spanish (mother tongue)
Certifications	Huawei Artificial Intelligence (HCIA-AI). [See certificate]
Miscellaneous	Photography (Bird photography), Guitar

Awards

2022	**Scholarship**, fully funded doctoral studies	*Lima, Perú*
2020	**Scholarship**, internship at EPFL	*Lima, Perú*
2017	**Scholarship**, fully funded master studies	*Lima, Perú*
2015	**First place**, undergraduate class	*Lima, Perú*

Volunteering Activities

Present	**Organizer**, Machine Learning reading group [Link]	*Virtual*
2022	**Advisor**, Journal Club IA UNI	*Lima, Perú*
2020	**Volunteer**, IEEE UNI Student Branch	*Lima, Perú*
2013	**Chair**, IEEE UNI Student Branch, we published some reports here: https://issuu.com/reieeeuni	*Lima, Perú*
2012	**Vice Chair**, Circuits and Systems IEEE UNI Student Chapter	*Lima, Perú*
2012	**Volunteer**, Rural Telecommunication Group	*Lima, Perú*
2011	**Co-Founder**, Computer Science Research Group - GICS Dennis Ritchie (https://es-la.facebook.com/GISCDennisRitchieUNI)	*Lima, Perú*
2011	**Organizer**, Student Congress - IEEE INTEERCON UNI 2011.	*Lima, Perú*