Dennis Hernando NÚÑEZ FERNÁNDEZ

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EDUCATION

- **CEA / Inria / Université Paris-Saclay, France.** **(2023 Oct - Ongoing)**
Ph.D. (c) in AI and Neuroimaging at Inria MIND team, advised by Ph.D. Philippe Ciuciu. Improving high-resolution brain MRI using motion correction via deep learning and reinforcement learning. Conducted at NeuroSpin (CEA Saclay).

- **Université Paris Cité, France.** **(2021 Sep - 2023 Jun)**
M.Sc. in Digital Sciences with focus in AI. In the top two of the master's class. GPA: 3.7/4.0. Relevant courses: Artificial Intelligence, NLP, Data Science, Robotics. Organized and conducted by EURIP Graduate School, Université Paris Cité.

- **Universidad Nacional de Ingeniería, Peru.** **(2010 Mar - 2015 Jul)**
B.Sc. in Electronic Engineering, first place in the graduating class. GPA: 3.5/4.0. Relevant courses: Digital Systems, Signal Processing and Systems, Theory of Control. Participated in IEEE-UNI student branch, and robotics competitions.

ADDITIONAL EDUCATION

- **CIFAR Deep Learning + Reinforcement Learning Summer School (DLRL), Canada.** **(2023 Jul)**
Selected to attend and winner of a travel scholarship. The school covered foundational research, new developments and real-world applications of deep learning & reinforcement learning. Hosted by CIFAR, Mila, Amii and Vector Institute.

- **Mediterranean Machine Learning Summer School (M2L), Milan, Italy.** **(2022 Sept)**
Selection based on merit. One week of keynotes, lectures and practical sessions, taught by local and international experts. Covered the topics of computer vision, transformers, generative models, and reinforcement learning. On-site attendance.

- **Oxford Machine Learning Summer School (OxML), Oxford, UK.** **(2022 Aug)**
Accepted to participate in the ML x Health school. Covered the most interesting topics in ML/DL (e.g., statistical/probabilistic ML, representation learning, causal inference, computer vision & NLP, geometrical DL, among others)

- **MITx MicroMasters in Statistics and Data Science, USA.** **(2020 Sep - 2022 Mar)**
The program provided MIT's rigorous, high-quality curricula. It lasted one and a half years, with courses on data science, statistics and machine learning. Funded by Aporta as part of the Advanced Program in Data Science & Global Skills.

- **Machine Learning Summer School (MLSS), Taipei, Taiwan.** **(2021 Aug)**
Accepted to attend and also present a poster. The school lasted 3 weeks and presents topics that are at the core of modern machine learning, from fundamentals to state-of-the-art practice. Organized by AINTU, NTU and the ACLCLP.

- **Eastern European Machine Learning Summer School (EEML), Hungary.** **(2021 Jul)**
Selection on merit. One-week summer school around core topics regarding machine learning and artificial intelligence. The school included both lectures and laboratories to improve the theoretical and practical understanding of the topics.

- **The Cornell, Maryland, Max Planck Research School (CMMRS), Germany.** **(2020 Aug)**
Rigorous selection on merit. The school lasted one week, with seminars by leading researchers (Cornell U., Maryland U. and Max Planck Instit.) on data analysis, security and privacy, machine learning, and also theory of deep learning.

- **10th Lisbon Machine Learning School (LxMLS), Lisbon, Portugal.** **(2020 Jul)**
Selection based on merit. The school lasted one week, with a series of classes, laboratory sessions and lectures by renowned researchers. It covered both basic (e.g. neural networks) and advanced topics (e.g. deep learning, reinforcement learning).

- **School of Artificial Intelligence at Pi School, Rome, Italy.** **(2020 May - 2020 Jun)**
Winner of a merit scholarship. It lasted 8 weeks, with seminars on AI, projects and mentoring. I worked on developing a summary generation system using BERT models, and giving a functional model for Entire Digital S.r.l. in record time.

LANGUAGES

- **Spanish** *(native)*   • **English [B2]** *(advanced)*   • **French [A1]** *(basic)*   • **German [A1]** *(basic)*

ACHIEVEMENTS AND AWARDS

- Ranked among the top two positions in the master's graduation class, Université Paris Cité. [top 8%]   (2023 Jul)
- Winner of the CIFAR Inclusive AI Scholarship for attend the DLRL Summer School 2023. [top 10%]   (2023 May)
- Selected together with our team as a Phase 1 Finalist of the 'OpenCV AI Competition 2021'. [top 15%]   (2021 Mar)
- Winner of the 'Alberto Benavides de la Quintana - France Embassy 2021' master's scholarship. [top 4%]   (2021 Feb)

- Winner of a scholarship for the 'Program in Data Science & Global Skills', by Aporta-MIT. [top 8%] (2020 Aug)
- Winner of a scholarship to participate in the 'School of Artificial Intelligence', Pi School, Italy. [top 6%] (2020 Mar)
- Selected and winner of a travel grant to the 'AI Latin American SumMIT 2020', held at the MIT. (2019 Dic)
- Winner of a scholarship by Fondecyt Peru for a research stay at University of Padua, Italy. [top 40%] (2019 Oct)
- LXAI Travel Grant for the Conference on Neural Information Processing Systems NeurIPS 2019. (2019 Oct)
- ICML and LXAI Travel Grants for the International Conference on Machine Learning ICML 2019. (2019 May)
- Winner of a fellowship for the 'UNESCO/Poland Co-Sponsored Program 2016' at AGH UST, Poland. (2016 Jun)
- First place of the Electronic Engineering graduating class, Universidad Nacional de Ingeniería. [top 4%] (2015 Jul)
- Top 10 Electronic Engineering GPA of the entire faculty during the periods 2014-I and 2014-II. [top 2%] (2014 Dec)

EXPERIENCE

- **Research Fellow (2023 Oct - Ongoing)**
CEA Paris-Saclay, Neurospin, Inria MIND team, Paris, France
Improving high-resolution brain MRI using deep learning and reinforcement learning. Advised by Philippe Ciuciu, PhD.
· Project: 'Active sampling for motion correction in accelerated high resolution brain imaging at 7 and 11.7 Tesla'.

- **Research Intern (2023 Mar - 2023 Aug)**
Artificial Intelligence Research Lab, Nokia Bell Labs, Paris, France
Design and analyze ML algorithms for preventive maintenance using real telecom data. Advised by Alonso Silva, PhD.
· Project: 'Using deep learning and techiques of survival analysis for preventive maintenance'.

- **Research Scientist Intern (2022 Sept - 2023 Mar)**
Hyperlex Software, Paris, France
Improvement of contract analysis in multiple languages by using limited data. Advised by Ahmed Touila, Senior Eng.
· Project: 'Development of a multilingual NLP approach for contract analysis in data-limited languages'.

- **Research Intern (2022 Mar - 2022 Aug)**
Northern Paris Computer Science Laboratory (LIPN), Université Sorbonne Paris Nord, Paris, France
Development of an advanced decoding algorithm for extractive question answering. Advised by Nadi Tomeh, PhD.
· Project: 'Representation and decoding algorithms for textual span extraction'.

- **Machine Learning Intern (2020 May - 2020 Jun)**
School of Artificial Intelligence, Pi School, Rome, Italy
Implementation of a NLP based system for Entire Digital S.r.l. in record time, advised by Sébastien Bratières, PhD.
· Project: 'Creation of an automatic summary generation system using BERT models'.

- **Visiting Research Fellow (2019 Dec - 2020 Mar)**
Visual Intelligence and Machine Perception Research Group, University of Padua, Padua, Italy
Development of an AI based system for healthcare, advised by Lamberto Ballán, PhD. Funded by Fondecyt Peru.
· Project: 'Implementation of a neural network for the diagnosis of tuberculosis using lens-less microscopy'.

- **Research Assistant (2019 Mar - 2019 Aug)**
Research Institute of the Faculty of Electrical and Electronic Engineering, Universidad Nacional de Ingeniería, Peru.
Implementation of a project on indoor location for Internet of Things, funding won in a competition for project proposals.
· Project: 'Development of a IoT guidance system for the UNI-FIEE campus based on Bayesian Probability'.

- **Research Assistant (2018 Jun - 2022 Jun)**
Laboratory of Bioinformatics and Molecular Biology, Universidad Peruana Cayetano Heredia, Lima, Peru
Application of several deep learning techniques to facilitate early medical diagnosis, advised by Mirko Zimic, PhD.
· Project: 'Using mobility in hamsters as an indicator of SARS-CoV-2 vaccine effectiveness'.
· Project: 'Detection of autism through emotion recognition and using Machine Learning'.
· Project: 'Diagnosing of tuberculosis using Deep Learning on lens-free microscopy images'.
· Project: 'Prediction of autism using gaze direction and convolutional neural networks'.
· Project: 'Detection of anemia using Machine Learning on images of the ocular conjunctiva'.

- **Research Assistant (2016 Oct - 2017 Mar)**
Faculty of Computer Science and Telecommunications, AGH University of Science and Technology, Kraków, Poland.
Development of a deep learning system, advised by Bogdan Kwolek, PhD. Part of the UNESCO Fellowship Program.
· Project: 'Hand posture recognition using Convolutional Neural Network'.

- **Embedded Systems Developer (2015 Jun - 2015 Sept)**
Telecommunications Research Center INICTEL-UNI, Universidad Nacional de Ingeniería, Lima, Peru.
Design of a FPGA system to read and optimize images from an analogue camera, advised by Vanessa Gamero, MSc.
· Project: 'Control of an analog camera with an FPGA for a custom satellite application'.

PUBLICATIONS

Journal Articles

• [under review] D. Núñez, J. Coronel. G. Jimenez-Avalos, X. Chunga, M. Salguedo, L. De la Cruz, R. H. Gilman, P. Sheen, M. Zimic. 'U-Net and segmentation techniques to analyze microscopic images of MODS cultures captured with a lens-free inverted microscope to facilitate the diagnostics of tuberculosis'. (2022)

• [under review] D. Núñez, F. Barrientos-Porras, R. H. Gilman, M. Vittet-Mondoñedo, P. Sheen, M. Zimic. 'A Convolutional Neural Network for gaze preference detection: A potential tool for diagnostics of autism spectrum disorder in children'. (2022)

• A. Agurto-Arteaga, A. Poma-Acevedo, D. Rios-Matos, [and others, including D. Núñez]. 'Preclinical Assessment of IgY Antibodies Against Recombinant SARS-CoV-2 RBD Protein for Prophylaxis and Post-Infection Treatment of COVID-19'. Frontiers in Immunology. (2022)

• M. Fernández Díaz, K. Calderón, A. Rojas-Neyra, [and others, including D. Núñez]. 'Intranasal vaccination of hamsters with a Newcastle disease virus vector expressing the S1 subunit protects animals against SARS-CoV-2 disease'. Nature Scientific Reports. (2022)

Conference Proceedings

• A. Aspilcueta Narvaez, D. Núñez, S. Gamarra Quispe, D. Lazo Ochoa. 'Smart Campus IoT guidance system for visitors based on Bayesian filters'. Brazilian Technology Symposium BTSym 2019. Lima, Peru. (2019)

• D. Núñez. 'Development of a hand gesture based control interface using Deep Learning'. International Conference on Information Management and Big Data SIMBig 2019. Lima, Peru. (2019)

• D. Núñez. 'Implementation of an indoor location system for mobile-based museum guidance'. International Conference on Information Management and Big Data SIMBig 2019. Lima, Peru. (2019)

• D. Núñez. 'Development of a hand pose recognition system on an embedded computer using Artificial Intelligence'. XXVI International Conf. on Electronics, Electrical Eng. and Computing INTERCON. Lima, Peru. (2019)

• D. Núñez. 'Implementation of a WiFi-based indoor location system on a mobile device for a university area'. XXVI International Conf. on Electronics, Electrical Eng. and Computing INTERCON. Lima, Peru. (2019)

• D. Núñez. 'Multi-subject continuous emotional states monitoring by using Convolutional Neural Networks'. International Conference on Control of Dynamical and Aerospace Systems XPOTRON 2019. Arequipa, Peru. (2019)

• D. Núñez, S. Hosseini. 'Real-time handwritten letters recognition on an embedded computer using ConvNets'. Sciences and Humanities International Research Conference SHIRCON 2018. Lima, Peru. (2018)

• D. Núñez. 'A Real-Time Recognition System for User Characteristics Based on Deep Learning'. XXV International Conf. on Electronics, Electrical Eng. and Computing INTERCON 2018. Lima, Peru. (2018)

• D. Núñez, B. Kwolek. 'Hand Posture Recognition Using Convolutional Neural Network'. 22nd Iberoamerican Congress on Pattern Recognition CIARP 2017. Valparaiso, Chile. (2017)

Workshop papers

• U. Zaratiana, N. El Khbir, D. Núñez, P. Holat, N. Tomeh, Th. Charnois. 'DyREx: Dynamic Query Representation for Extractive Question Answering'. 2nd Workshop on Efficient Natural Language and Speech Processing at NeurIPS 2022. New Orleans, USA. (2022)

• C. Rojas-Azabache, K. Vilca-Janampa, R. Guerrero-Huayta, D. Núñez. 'Implementing a Detection System for COVID-19 based on Lung Ultrasound Imaging and Deep Learning'. Beyond Fairness Workshop at CVPR 2021. Tennessee, USA. (2021)

• D. Núñez, L. Ballan, G. Jiménez-Avalos, J. Coronel, P. Sheen, M. Zimic. 'Prediction of Tuberculosis using U-Net and segmentation techniques'. AI for Public Health Workshop at ICLR 2021. Vienna, Austria. (2021)

• C. Rojas-Azabache, K. Vilca-Janampa, R. Guerrero-Huayta, D. Núñez. 'Detection of COVID-19 Disease using Deep Neural Networks with Ultrasound Imaging'. Practical Machine Learning for Developing Countries Workshop at ICLR 2021. Vienna, Austria. (2021)

• D. Núñez, L. Ballan, G. Jiménez-Avalos, J. Coronel-Herrera, M. Zimic-Peralta. 'Automatic semantic segmentation for prediction of tuberculosis using lens-free microscopy images'. Machine Learning for Global Health Workshop at ICML 2020. Vienna, Austria. (2020)

• D. Núñez, L. Ballan, G. Jiménez-Avalos, J. Coronel-Herrera, M. Zimic-Peralta. 'Using Capsule Neural Network to predict Tuberculosis in lens-free microscopic images'. Healthcare Systems, Population Health, and the Role of Health-Tech (HSYS) Workshop at ICML 2020. Vienna, Austria. (2020)

• D. Núñez, F. Porras-Barrientos, M. Vittet-Mondoñedo, R. H. Gilman, M. Zimic-Peralta. 'Prediction of gaze direction using Convolutional Neural Networks for Autism diagnosis'. LatinX in AI (LXAI) Research Workshop at NeurIPS 2019. Vancouver, Canada. (2019)

• B. Saldivar-Espinoza, D. Núñez, F. Porras-Barrientos, A. Alva-Mantari, L. S. Leslie, M. Zimic-Peralta. 'Portable system for the prediction of anemia based on the ocular conjunctiva using Artificial Intelligence'. LatinX in AI (LXAI) Research Workshop at NeurIPS 2019. Vancouver, Canada. (2019)

• D. Núñez. 'Development of a hand pose recognition system on an embedded computer using CNNs'. LatinX in AI

(LXAI) Research Workshop at NeurIPS 2019. Vancouver, Canada. (2019)

- D. Núñez, B. Kwolek. 'Hand Posture Recognition Using Convolutional Neural Networks'. LatinX in AI (LXAI) Research Workshop at ICML 2019. Long Beach, USA. (2019)

ACADEMIC SERVICE

- **Paper reviewer**

LatinX in AI Research Workshop at NeurIPS (2019, 2020, 2021, 2022, 2023) − LatinX in AI Research Workshop at ICML (2020, 2021, 2022, 2023) − IEEE INTERCON Conference (2020, 2021, 2022, 2023) − IEEE EIRCON Conference (2020, 2022) − Science and Engineering of Deep Learning Workshop at ICLR (2021) − LatinX in CV Research Workshop at CVPR (2021, 2022, 2023, 2024) − LatinX in NLP Research Workshop at NAACL (2022, 2024) − LatinX in CV Research Workshop at ECCV (2022) − LatinX in CV Research Workshop at ICCV (2023) − SimBig Conference (2023) − Journal of LatinX in AI Research JLXAIR (2024) − ICLR Main Conference (2022, 2024) − NeurIPS Main Conference (2022, 2023) − ICML Main Conference (2024).

- **General tasks**

Session chair at UNESCO UCTE (2016) − Volunteer at LatinX in AI Workshop at ICML (2019, 2020) − Volunteer at LatinX in AI Workshop at NeurIPS (2019, 2020) − Mentor at the III Peruvian Deep Learning Symposium (2021) − Co-organizer at LatinX in AI Social at ICLR (2021) − Volunteer at LatinX in CV Workshop at CVPR (2021) − Workshop chair at LatinX in AI Workshop at ICML (2021) − Volunteer at NAACL (2022) − Volunteer at ICCV (2023).

INVITED TALKS

- **'Health Technology Assessment: A Public Health Impact Perspective'. Lima, Peru (2024 Feb).** Organized by the Institute for Health Technology Assessment and Research - IETSI (Peru).

- **'Impact of AI on medical imaging and opportunities abroad'. Lima, Peru (2024 Jan).** Organized by the IEEE Student Chapter of Signal Processing of the Universidad Nacional Mayor de San Marcos.

- **'Journey towards AI Research: Perspectives and Recommendations'. Lima, Peru (2023 Dec).** Given in the context of a series of monthly workshops. Organized by the Advanced Program in Data Science (BREIT).

- **'Deep Learning Tools and Applications'. Lima, Peru (2023 Dec).** Given at the National Week of Science 2023, organized by the Universidad Nacional del Santa and CONCYTEC Peru.

- **'Computer Vision in embedded systems for real-time applications'. Lima, Peru (2022 Nov).** Given at the event 'Electronic Week 2022', organized by the Pedro Paulet student center of the FIEE - UNI.

- **'Machine Learning: an important tool for technological development'. Lima, Peru (2022 Jun).** Given in the '1st International Congress Energy Transition to 2050', organized by the FIM faculty - UNI.

- **'Looking for new horizons: academic opportunities abroad'. Lima, Peru (2022 Apr).** Given as part of the 'SPS Opportunities Conference Week', organized by IEEE UNI Signal Processing Society (SPS).

- **'Research and implementation of a convolutional neural network for TB diagnosis via digital images obtained by lens-free microscopy'. Lima, Peru (2021 Dec).** Given at the VIII International Scientific Conference on Peruvian Research for Tuberculosis Control, which was organized by the Ministry of Health of Peru.

- **'Artificial Intelligence: rise, applications and how to start'. Tacna, Peru (2021 Dec).** Given in the XXII International Congress of Computer Science, organized by National University Jorge Basadre Grohmann.

- **'Research and Internships in Applied Artificial Intelligence'. Lima, Peru (2021 Jul).** Given at the 118th anniversary of the Faculty of Electrical and Electronic Engineering of the Universidad Nacional de Ingeniería.

- **'Tuberculosis prediction through segmentation with deep learning techniques'. Lima, Peru (2021 Jun).** Given in the I Series of talks on Deep Learning, which was organized by Data Science Woman Peru.

- **'Segmentation for prediction of tuberculosis using lens-free microscopy images'. Lima, Peru (2021 Jan).** Given in the III Peruvian Deep Learning Symposium (SPDL), which was organized by ML/DL Meetup AQP.

- **'Artificial Intelligence: Research and Potential Applications'. Cesar, Colombia (2020 Dec).** Organized by the Universidad Popular del Cesar as part of the II Scientific Conference 'Facing new challenges'.

- **'UNI Experience - Electronic Engineering'. Lima, Peru (2020 Oct).** Given at the Universidad Nacional de Ingeniería (UNI) as part of a series of professional talks, which was organized by Inspírate UNI.

- **'How to participate in Artificial Intelligence workshops, internships and more'. Lima, Peru (2020 Sept).** Given at the Universidad Nacional de Ingeniería, organized by the UNI's Advanced Artificial Intelligence Group.

- **'Diagnosis of Anemia through a Mobile Device and Artificial Intelligence'. Lima, Peru (2020 Sept).** Given at the 'Semana de la Innovación 2020', which was organized by CONCYTEC Peru.

- **'Deep Learning: Fundamentals and Applications'. Lima, Peru (2020 Jul).** Given at the Faculty of Electrical and Electronic Engineering - FIEE UNI, organized by the Signal Processing Society of the IEEE UNI.

- **'Research internship experiences abroad'. Lima, Peru (2020 Jul).** Given by the 117th anniversary of the Faculty of Electrical and Electronic Engineering of the Universidad Nacional de Ingeniería (UNI).

- **'Development and Application of Artificial Intelligence in Health'. Lima, Peru (2019 Nov).** Given at the Faculty of Pharmacy and Biochemistry of the Universidad Nacional Mayor de San Marcos (UNMSM).

- **'Research and Development in Artificial Intelligence'. Lima, Peru (2019 Sept).** Given in the '22do Meetup 2019 Dats Science Research Peru', organized by Dats Science Research Peru (DSRP).

- **'A portable system based on Artificial Intelligence for the diagnosis of anemia'. Lima, Peru (2019 May).** Given as part of the first edition of the event 'Innova como ellos', organized by Innóvate Perú.

- **'Prediction of gaze direction based on CNN for diagnosis of Autism'. Lima, Peru (2019 May).** Given at the 'Colloquium on Computer Science Applications', organized by CEPRECYT Peru.

TECHNICAL SKILLS

- **Software**
Machine Learning Frameworks (Tensorflow, PyTorch, Caffe, Keras) − OpenCL − CUDA − C/C++ − Python − R − Java − OpenCV − Matlab − Git − Mercurial − LaTeX − Hardware Description Languages (VHDL, Verilog).

- **Hardware**
Parallella embedded platform (Xilinx Zynq SOC 7020 and 16 core Epiphany CPU) − Raspberry Pi − FPGA Xilinx Spartan 3E − FPGA Altera Cyclone III and Cyclone II − ARM and Atmel microcontrollers − Arduino platform.