José Ignacio Orlando, Ph.D.

CONTACT INFORMATION

Assistant Researcher
CONICET
PLADEMA / UNICEN
Gral. Pinto 399
7000 Tandil, Buenos Aires, Argentina

Work: +54 249 438 5690 (Int 2411)
E-mail: jiorlando@pladema.exa.unicen.edu.ar
WWW: ignaciorlando.github.io

SUMMARY

Researcher in artificial intelligence and computer vision in medicine. University educator in artificial intelligence and applied mathematics. More than 10 years of academic and professional experience developing AI-based solutions for real problems in medicine, with more emphasis in ophthalmology. Passionate about coordinating working groups and educating new independent talents on solving challenging problems with innovative digital tools.

CURRENT AFFILIATIONS

Assistant Researcher, CONICET — Since November 2019
- PLADEMA Institute, Universidad Nacional del Centro de la Provincia de Buenos Aires, Tandil, Argentina.

Professor, UBA — Since April 2022
Visión Computacional Basada en Redes Neuronales, Maestría en Explotación de Datos y Descubrimiento del Conocimiento, Facultad de Ciencias Exactas y Naturales, Universidad Nacional de Buenos Aires (UBA), CABA, Argentina.

Teaching Assistant, UNICEN — Since April 2020
Teoría de la Información, Departamento de Computación y Sistemas, Facultad de Ciencias Exactas, Universidad Nacional del Centro de la Provincia de Buenos Aires (UNICEN), Tandil, Argentina.

PREVIOUS AFFILIATIONS

Postdoctoral Research Associate, OPTIMA — January 2018 - September 2019
- Christian Doppler Laboratory for Ophthalmic Image Analysis (OPTIMA), Department of Ophthalmology and Optometry, Medical University of Vienna, Vienna, Austria.

Postdoctoral Research Associate, CONICET — September 2017 to January 2018
- Pladema Institute, Facultad de Ciencias Exactas, UNICEN, Argentina.
- CCT Tandil, CONICET, Argentina.

Teaching Assistant, UNICEN — August 2010 to January 2018
Facultad de Ciencias Exactas

Ph.D Student, CONICET — April 2013 to September 2017
- Pladema Institute, Facultad de Ciencias Exactas, UNICEN, Argentina.
- CCT Tandil, CONICET, Argentina.

Intern, Inria Saclay - Team GALEN — May-November 2013
- Center for Learning and Visual Computing (CVN), Centrale Supelec, Paris, France.

EDUCATION

Universidad Nacional del Centro de la Provincia de Buenos Aires (UNICEN), Tandil, PBA, Argentina

Ph.D., Computational and Industrial Mathematics, April 2013 - September 2017, *summa cum laude*

- Thesis: *Machine learning for ophthalmic screening and diagnostics from fundus images*
- Advisors: Dr. Matthew B. Blaschko and Dr. Mariana del Fresno
- Area of Study: Medical imaging

M.S., Software Engineering, March 2013

- Thesis Topic: *Texture based segmentation of 3D medical images*
- Advisor: Dr. Mariana del Fresno
- Area of Study: Image and Signal Processing

TEACHING

Universidad Nacional del Centro de la Provincia de Buenos Aires, Tandil, PBA; Argentina

Professor **2020**

- Machine Learning (Aprendizaje de máquina) (2020-Today). Diplomatura Universitaria en Inteligencia Artificial. Facultad de Ciencias Exactas.
- Computer Vision with Artificial Intelligence (Visión Computacional Basada en Inteligencia Artificial) (2020-Today). Diplomatura Universitaria en Inteligencia Artificial. Facultad de Ciencias Exactas.

Teaching assistant **March 2010**

- Workshop on Computational Mathematics (2021-Today)
- Information Theory (2020)
- Workshop on Computational Mathematics (2015-2017)
- Information Theory (2013-2016)
- Workshop on Medical Imaging (2014-2015)
- Software Development Methodologies (2010-2012)

Escuela de Educación Técnica N. 1, Las Flores, PBA; Argentina

Professor **2010-2013**

- Operating Systems Laboratory
- Artificial Intelligence
- Network Systems Implementation

CONSULTING

CONICET STAN 5948 - Hired by Arionkoder Global LLC, 2022-Ungoing

- Subject Matter Expert in ML/AI, to assist their AI processes.

CONICET STAN 5887 - Hired by UNICEN, 2021-Ungoing

- Advisoring in AI and medical image processing and analysis for computer-assisted treatment with STENTs.

TECH TRANSFER

retinar. AI-based platform for diabetic retinopathy detection. 2019-Ungoing

- Lead by myself, this project seeks to develop a telemedicine platform for diabetic retinopathy screening based on AI models.

SIMECO. Abdominal Ultrasound Simulator based on ray-casting techniques and artificial intelligence. 2019-Ungoing

- Lead by Santiago Vitale, this project seeks to develop a cutting-edge realistic abdominal ultrasound simulator for training clinicians in disease diagnosis and treatment.

METRICS

- Google Scholar: H-index = 16. i10 index = 18. Total number of citations: 1546. (Last checked: November 2nd 2022)

REFEREED JOURNAL PUBLICATIONS

[1] L. Rocamora, *J. I. Orlando*, C. Lwowski, T. Kohnen, E. Mertens and K. van Keer. Postoperative vault prediction for phakic implantable collamer lens surgery: the LASSO formulae. *Journal of Cataract & Refractive Surgery*, In press, 2022. doi:10.1097/j.jcrs.0000000000001079. IF: 3.351 (2022). Scimago Quartile: Q1.

[2] H. Fang, F. Li, H. Fu, X. Sun, X. Cao, F. Lin, J. Son, S. Kim, G. Quellec, S. Matta, S. M. Shankaranarayana, Y-T. Chen, C-h. Wang, N. A. Shah, C-Y. Lee, C-C. Hsu, H. Xie, B. Lei, U. Baid, S. Innani, K. Dang, W. Shi, R. Kamble, N. Singhal, C-W. Wang, S-C. Lo, *J. I. Orlando*, H. Bogunović, X. Zhang and Y. Xu. ADAM Challenge: Detecting Age-related Macular Degeneration from Fundus Images. *IEEE Transaction on Medical Imaging*, In press, 2022. doi:10.1109/TMI.2022.3172773. IF: 13.94 (2020). Scimago Quartile: Q1.

[3] D. Hofer, U. Schmidt-Erfurth, *J. I. Orlando*, F. Goldbach, B. S. Gerendas and P. Seeböck. Improving Foveal Avascular Zone Segmentation in Fluorescein Angiograms by Leveraging Manual Vessel Labels from Public Color Fundus Pictures. *Biomedical Optics Express*, 13(5): 2566-2580, 2022. doi:10.1364/BOE.452873. IF: 3.732 (2022). Scimago Quartile: Q1.

[4] P. Seeböck, W-D Vogl, S. M. Waldstein, *J. I. Orlando*, M. Baratsits, T. Alten, M. Arikan, G. Mylonas, H. Bogunović and U. Schmidt-Erfurth. Linking Function and Structure with ReSenseNet: Predicting Retinal Sensitivity from Optical Coherence Tomography using Deep Learning. *Ophthalmology Retina*, In press, 2022. doi:10.1016/j.oret.2022.01.021. IF: 3.9 (2022). Scimago Quartile: Q1.

[5] P. Navarro, *J. I. Orlando*, C. Delrieux and E. Iarussi. SketchZooms: Deep Multiview Descriptors for Matching Line Drawings. *Computer Graphics Forum*, 40(1): 410-423, 2020. doi:10.1111/cgf.14197. IF: 2.116 (2018). Scimago Quartile: Q1.

[6] P. G. P. Ziemer, C.A. Bulant, *J.I. Orlando*, G. D. Maso Talou; L. A. M. Álvarez, C. Guedes Bezerra; P. A. Lemos, H. M. García-Garía and P. J. Blanco. Automated lumen segmentation using multi-frame convolutional neural networks in Intravascular Ultrasound datasets. *European Heart Journal Digital Health*, 1(1): 75-82, 2020. doi:10.1093/ehjdh/ztaa014. IF: N/A (journal created in 2020).

[7] H. Külsgaard, *J. I. Orlando*, M. Bendersky, J. P. Princich, L. S. R. Manzanera, A. Vargas, S. Kochen and I. Larrabide. Machine learning for filtering out false positive grey matter atrophies in single subject voxel based morphometry: a simulation based study. *Journal of the Neurological Sciences*, 420: 117220, 2020. doi:10.1016/j.jns.2020.117220. IF: 3.115 (2019). Scimago Quartile: Q2.

[8] H. Fu, F. Li, X. Sun, X. Cao, J.Liao, *J. I. Orlando*, ..., Y. Xu. AGE Challenge: Angle Closure Glaucoma Evaluation in Anterior Segment Optical Coherence Tomography. *Medical Image Analysis*, 66: 101798, 2020. doi:10.1016/j.media.2020.101798. IF: 11.148 (2019). Scimago Quartile: Q1.

[9] *J. I. Orlando*, B.S. Gerendas, S. Riedl, C. Grechenig, A. Breger, M. Ehler, S.M. Waldstein, H. Bogunović and U. Schmidt-Erfurth. Automated Quantification of Photoreceptor alteration in macular disease using Optical Coherence Tomography and Deep Learning. *Scientific Reports*. 10, 2020. doi:10.1038/s41598-020-62329-9. IF: 4.12 (2018). Scimago Quartile: Q1.

[10] *J. I. Orlando*, H. Fu, J. Barbossa Breda, K. van Keer, D. R. Bathula, A. Díaz Pinto, R. Fang, ..., H. Bogunović. REFUGE Challenge: A Unified Framework for Evaluating Automated Methods for Glaucoma Assessment from Fundus Photographs. *Medical Image Analysis*, 59, 2020.
doi:10.1016/j.media.2019.101570. IF: 11.148 (2019). Scimago Quartile: Q1.

[11] P. Seeböck, *J.I. Orlando*, T. Schlegl, S.M. Waldstein, H. Bogunović, S. Klimscha, G. Langs and U. Schmidt-Erfurth. Exploiting Epistemic Uncertainty of Anatomy Segmentation for Anomaly Detection in Retinal OCT. *IEEE Transactions in Medical Imaging*, 39(1):87–98, 2020.
doi:10.1109/TMI.2019.2919951. IF: 7.8 (2018). Scimago Quartile: Q1.

[12] D. Romo-Bucheli, P. Seeböck, *J. I. Orlando*, B.S. Gerendas, S.M. Waldstein, U. Schmidt-Erfurth, H. Bogunović. Reducing image variability across OCT devices with unsupervised unpaired learning for improved segmentation of retina. *Biomedical Optics Express*, 11(1):346–363, 2020.
doi:10.1364/BOE.379978. IF: 3.910 (2018). Scimago Quartile: Q1.

[13] A. Breger, *J. I. Orlando*, P. Harar, M. Dörfler, S. Klimscha, C. Grechenig, B. S. Gerendas, U. Schmidt-Erfurth, M. Ehler. On Orthogonal Projections for Dimension Reduction and Applications in Augmented Target Loss Functions for Learning Problems. *Journal of Mathematical Imaging and Vision*, 62, 376–394, 2020.
doi:10.1007/s10851-019-00902-2. IF: 1.603 (2017). Scimago Quartile: Q1.

[14] S. Vitale, *J.I. Orlando*, E. Iarussi and I. Larrabide. Improving realism in patient-specific abdominal Ultrasound simulation using CycleGANs. *International Journal of Computer Assisted Radiology and Surgery*, 15, 183–192, 2020.
doi:10.1007/s11548-019-02046-5. IF: 2.155 (2018). Scimago Quartile: Q1.

[15] *J.I. Orlando*, E. Prokofyeva, M. del Fresno, and M.B. Blaschko. An ensemble deep learning based approach for red lesion detection in fundus images. *Computer Methods and Programs in Biomedicine*, 153(1):115–127, 2018.
doi:10.1016/j.cmpb.2017.10.017. IF: 2.674 (2017). Scimago Quartile: Q1.

[16] *J.I. Orlando*, K. van Keer, J. Barbosa-Breda, H.L. Manterola, M.B. Blaschko, and A. Clausse. Proliferative Diabetic Retinopathy Characterization based on Fractal Features: Evaluation on a Publicly Available Data Set. *Medical Physics*, 44(12):6425–6434, 2017.
doi:10.1002/mp.12627. IF: 2.617 (2016). Scimago Quartile: Q1.

[17] *J.I. Orlando*, E. Prokofyeva, and M.B. Blaschko. A discriminatively trained fully connected conditional random field model for blood vessel segmentation in fundus images. *IEEE Transaction on Biomedical Engineering*, 64(1):16–27, 2017.
doi:10.1109/TBME.2016.2535311. IF: 4.288 (2017). Scimago Quartile: Q1.

[18] L.D. Lo Vercio, *J.I. Orlando*, M. del Fresno, and I. Larrabide. Assessment of image features for vessel wall segmentation in intravascular ultrasound images. *International Journal of Computer Assisted Radiology and Surgery*, 11(8):1397–1407, 2016.
doi:10.1007/s11548-015-1345-4. IF: 1.961 (2014). Scimago Quartile: Q2.

[19] *J.I. Orlando*, and M. del Fresno. Reviewing preprocessing and feature extraction techniques for retinal blood vessels segmentation in fundus images. *Mecánica Computational*, 33(42):2729–2743, 2014.
Indexed: Latindex.

CONFERENCE PUBLICATIONS

[20] T. Castilla, M.S. Martínez, M. Leguía, I. Larrabide and *J.I. Orlando*. A ResNet is All You Need? Modeling A Strong Baseline for Detecting Referable Diabetic Retinopathy in Fundus Images. *18th International Symposium on Medical Information Processing and Analysis (SIPAIM 2022)*, Proceedings of SPIE. 2022.
In press.

[21] E. Moris, N. Dazeo, M.P. Albina de Rueda, F. Filizzola, N. Iannuzzo, D. Nejamkin, K. Wignall, M. Leguía, I. Larrabide and *J.I. Orlando*. Assessing Coarse-to-Fine Deep Learning Models for Optic Disc and Cup Segmentation in Fundus Images. *18th International Symposium on Medical Information Processing and Analysis (SIPAIM 2022)*, Proceedings of SPIE. 2022.
In press.

[22] C. García, Y. Fang, J. Liu, A.P. Narata, *J.I. Orlando* and I. Larrabide. A deep learning model for brain vessel segmentation in 3DRA with arteriovenous malformations. In: 18th International Symposium on Medical Information Processing and Analysis (SIPAIM 2022), Proceedings of SPIE. 2022.
In press.

[23] *J.I. Orlando*, A. Breger, H. Bogunović, S. Riedl, B.S. Gerendas, M. Ehler and U. Schmidt-Erfurth. An amplified-target loss approach for photoreceptor layer segmentation in pathological OCT scans. En: *6th MICCAI International Workshop on Ophthalmic Medical Image Analysis (OMIA 2019)*, Lecture Notes in Computer Science, vol 11855, 26-34. 2019.
doi:10.1007/978-3-030-32956-3_4

[24] D. Hofer, *J.I. Orlando*, P. Seeböck, G. Mylonas, F. Goldbach, A. Sadeghipour, B.S. Gerendas and U. Schmidt-Erfurth. Foveal avascular zone segmentation in clinical routine fluorescein angiographies using multitask learning. En: *6th MICCAI International Workshop on Ophthalmic Medical Image Analysis (OMIA 2019)*, Lecture Notes in Computer Science, vol 111855, 35-42. 2019.
doi:10.1007/978-3-030-32956-3_5

[25] R. Asgari, *J.I. Orlando*, S. Waldstein, F. Schlanitz, M. Baratsits, U. Schmidt-Erfurth and H. Bogunović. Multiclass segmentation as multitask learning for drusen segmentation in retinal optical coherence tomography. En: *Medical Image Computing and Computer Assisted Intervention (MICCAI 2019)*, Lecture Notes in Computer Science, vol. 11764, 192-200, 2019.
doi:10.1007/978-3-030-32239-7_22

[26] *J.I. Orlando*, P. Seeböck, H. Bogunovic, S. Klimscha, C. Grechenig, S. Waldstein, B.S. Gerendas and U. Schmidt-Erfurth. U2-Net: A Bayesian U-Net model with epistemic uncertainty feedback for photoreceptor layer segmentation in pathological OCT scans. In: *2019 IEEE 16th International Symposium on Biomedical Imaging (ISBI 2019)*, 1441-1445, 2019.
doi:10.1109/ISBI.2019.8759581

[27] P. Seebock, D. Romo Bucheli, S. Waldstein, H. Bogunovic, *J.I. Orlando*, B.S. Gerendas, G. Langs and U. Schmidt-Erfurth. Using CycleGANs for effectively reducing image variability across OCT devices and improving retinal fluid segmentation. In: *2019 IEEE 16th International Symposium on Biomedical Imaging (ISBI 2019)*, 605-609, 2019.
doi:10.1109/ISBI.2019.8759158

[28] *J.I. Orlando*, J. Barbosa-Breda, K. van Keer, M.B. Blaschko, P.J. Blanco and C.A. Bulant. Towards a glaucoma risk index based on simulated hemodynamics from

fundus images. In: *Medical Image Computing and Computer Assisted Intervention (MICCAI 2018)*, Lecture Notes in Computer Science, 11071, 65-73, 2018. doi:10.1007/978-3-030-00934-2_8

[29] *J.I. Orlando*, M. Fracchia, V. del Río, and M. del Fresno. Retinal blood vessel segmentation in high resolution fundus photographs using automated feature parameter estimation. In: *13th International Symposium on Medical Information Processing and Analysis (SIPAIM 2017)*, Proc. SPIE, 10572, 1057210, 2017. doi:10.1117/12.2283539

[30] *J.I. Orlando*, E. Prokofyeva, M. del Fresno, and M.B. Blaschko. Convolutional neural network transfer for automated glaucoma identification. In: *12th International Symposium on Medical Information Processing and Analysis (SIPAIM 2016)*, Proc. SPIE, 10160, 101600U-101600U-10, 2017. doi:10.1117/12.2255740

[31] *J.I. Orlando*, and M.B. Blaschko. Learning fully-connected CRFs for blood vessel segmentation in retinal images. In: *Medical Image Computing and Computer Assisted Intervention (MICCAI 2014)*, Lecture Notes in Computer Science, 8673, 634-641, 2014. doi:10.1007/978-3-319-10404-1_79

arXiv reports

[32] *J.I. Orlando*, H.L. Manterola, E. Ferrante, and F. Ariel. Arabidopsis roots segmentation based on morphological operations and CRFs. arXiv:1704.07793. Presented at *ECImag 2014 (School and Workshop on Image Sciences)*, August 11–15, 2013.

Abstracts, Posters and Presentations in International Conferences

[33] R. Asgari, *J.I. Orlando*, S. Waldstein, F. Schlanitz, M. Baratsits, U. Schmidt-Erfurth and H. Bogunović. Multiclass segmentation as multitask learning for drusen segmentation in retinal optical coherence tomography. In: *Medical Image Cluster (MIC) Festival 2019*, 2019, Vienna, Austria. Poster presentation. Presenter: R. Asgari.

[34] D. Hofer, *J.I. Orlando*, P. Seeböck, B. Gerendas and U. Schmidt-Erfurth. Foveal avascular zone segmentation in clinical routine fluorescein angiographies using multitask learning. In: *Medical Image Cluster (MIC) Festival 2019*, 2019, Vienna, Austria. Poster presentation. Presenter: D. Hofer.

[35] S. Vitale, *J.I. Orlando*, E. Iarussi, and I. Larrabide. Improving realism in patient-specific abdominal Ultrasound simulation using CycleGANs. In: *CARS 2019*, 2019, Rennes, France. Poster presentation. Presenter: S. Vitale.

[36] P. Seeböck, W.-D. Vogl, S.M. Waldstein, M. Baratsits, *J.I. Orlando*, T. Alten, H. Bogunović, M. Arikan, G. Mylonas and U. Schmidt-Erfurth. Linking Function and Structure: Prediction of Retinal Sensitivity in AMD from OCT using Deep Learning. In: *ARVO 2019 Annual Meeting*, 2019. Poster presentation. Presenter: Phillip Seeböck (PhD Student, OPTIMA, Medical University of Vienna).

[37] A. Breger, M. Ehler., B.S. Gerendas, *J.I. Orlando*, U. Schmidt-Erfurth. Dimension reduction in learning tasks. In: *90th GAMM Annual Meeting*, 2019. Poster presentation. Presenter: Anna Breger (PhD Student, Department of Mathematics, University of Vienna).

[38] A. Breger, *J.I. Orlando*, M. Ehler. Learning and Dimension Reduction in Medical Image Analysis. In: *SIAM Conference on Imaging Sciences*, 2018. Poster presentation. Presenter: Anna Breger (PhD Student, Department of Mathematics, University of Vienna).

Posters and Presentations in National Conferences

[39] D. Deangeli, F. Iarussi, H. Külsgaard, D. Braggio, J.P. Princich, M. Bendersky, E. Iarussi, I. Larrabide and *J.I. Orlando*. Un índice basado en inteligencia artificial para la cuantificación de desviaciones de la asimetría normal del hipocampo a partir de resonancia magnética cerebral. In: *CADI 2022, Congreso Argentino de Diagnóstico por Imagen*, 2022. Poster.

[40] S. Vitale, *J.I. Orlando*, E. Iarussi, A. Díaz and I. Larrabide. SIMECO: Un simulador de ecografías realistas basado en algoritmos de trazado de rayos e inteligencia artificial. In: *CADI 2022, Congreso Argentino de Diagnóstico por Imagen*, 2022. Poster.

[41] C. García, A.P. Narata, Y. Fang, *J.I. Orlando* and I. Larrabide. Extracción automática de la vasculatura cerebral en imágenes de ATC. In: *CADI 2022, Congreso Argentino de Diagnóstico por Imagen*, 2022. Poster.

[42] E. Moris, I. Larrabide and *J.I. Orlando*. Estimación automática de la relación vertical copa-disco mediante redes neuronales de segmentación a partir de fotografías de fondo de ojo. In: *CADI 2022, Congreso Argentino de Diagnóstico por Imagen*, 2022. Digital Poster.

[43] *J.I. Orlando*, T. Castilla, A. Koch, I. Larrabide, M. Martínez y M. Leguía. Evaluación retrospectiva de un primer modelo de inteligencia artificial argentino para tamizaje automático de retinopatía diabética referible a partir de fotografías de fondo de ojo. In: *CNO22, Congreso Nacional de Oftalmología 2022*, 2022. Oral presentation.

[44] D. Braggio, H. Külsgaard, *J.I. Orlando*, J.P. Princich, M. Bendersky, S. Kochen and I. Larrabide. Caracterización morfológica de poblaciones cerebrales de control mediante autocodificadores con convoluciones basadas en grafos. In: *IA@Litoral: 1ras Jornadas de Inteligencia Artificial del Litoral*, 2019. Poster.

[45] S. Vitale, *J.I. Orlando*, E. Iarussi and I. Larrabide. Mejorando el realismo de un simulador de ultrasonido abdominal paciente-específico utilizando CycleGANs. In: *IA@Litoral: 1ras Jornadas de Inteligencia Artificial del Litoral*, 2019. Poster.

[46] *J.I. Orlando*, H.L. Manterola, E. Ferrante, and M. del Fresno. Un esquema de superficies activas basado en texturas para la segmentación de tumores cerebrales en MRI. In: *Proceedings of the 1st National Conference on Software Engineering / Information Systems (CONAIISI 2013)*, 2013. Full article (in Spanish), oral presentation.

[47] *J.I. Orlando*, and M. del Fresno. Segmentación automática de tejidos cerebrales en MRI multiespectrales mediante clasificación por mínima distancia euclídea. In: *Proceedings of the Argentine Conference on Informatics and Health (CAIS 2013)*, 2013. Full article (in Spanish), oral presentation.

[48] H.L. Manterola, *J.I. Orlando*, E. Ferrante, and M. del Fresno. Extracción de objetos en imágenes médicas tridimensionales basada en características texturales. In: *Proceedings of the Argentine Conference on Informatics and Health (CAIS 2013)*, 2013. Full article (in Spanish), oral presentation.

[49] *J.I. Orlando*, H.L. Manterola, E. Ferrante, and M. del Fresno. Detección de tumores en MRI basada en características texturales. In: *Proceedings of the School and Workshop on Image Sciences (ECImag 2012)*, 2012. Full article (in Spanish), oral presentation.

[50] *J.I. Orlando*, H.L. Manterola, E. Ferrante, and M. del Fresno. Un enfoque híbrido para la segmentación de tumores en MRI cerebrales. In: *Proceedings of the Argentine Conference on Informatics and Health (CAIS 2012)*, 2012. Full article (in Spanish), oral presentation.

ADVISING AND MENTORING

PhD students

- **Santiago Vitale**, 2019, PhD in Computational and Industrial Mathematics (UNICEN)
  Topic: Unpaired generative adversarial learning model for simulating realistic ultrasound abdominal images.
  Advisor: Ignacio Larrabide Co-advisor: José Ignacio Orlando

Training in Research Scholarships

- **Tomás Castilla**, 2021–2022, Beca INI de Ingreso a la Investigación (Programa de Fortalecimiento a la Ciencia y la Tecnología en las Universidades Nacionales)
  Topic: Deep learning algorithms for computer assisted diagnostic of diabetic retinopathy from fundus photographs.
  Advisor: José Ignacio Orlando

- **Francisco Iarussi**, 2020–2021, Beca EVC-CIN de Estímulo a las Vocaciones Científicas 2019
  Topic: DeepBrain: Machine Learning applied to study brain morphological alterations in MRI scans.
  Advisor: Ignacio Larrabide
  Co-advisor: José Ignacio Orlando

Undergraduate Theses

- **Lautaro Gramuglia**, 2020-2021, Software Engineering thesis (director)
  Thesis topic: Artery/Vein classification from color fundus photographs for blood flow simulations
  Co-advisor: Carlos A. Bulant. Finished. Score: 10/10.

- **Tomás Castilla**, 2020–2021, Software Engineering thesis (director)
  Thesis topic: Deep learning algorithms to support diabetic retinopathy screening on fundus photographs
  Co-advisor: Ignacio Larrabide. Finished. Score: 10/10.

- **Rodrigo Cobo**, 2019–2020, Software Engineering thesis (director)
  Thesis topic: Stereoscopic camera simulation using neural networks
  Co-advisor: Ignacio Larrabide. Finished. Score: 10/10.

- **Francisco Iarussi**, 2020–2021, Software Engineering thesis (co-advisor)
  Thesis topic: Characterization of hypocampal assimetry using artificial intelligence techniques..
  Advisors: Emmanuel Iarussi e Ignacio Larrabide
  Finished. Score: 10/10.

- **Mauro Giamberardino, Ariel Borthiry**, 2016–2017, Software Engineering thesis (director)
  Thesis topic: Retinal blood vessel segmentation in ultra-wide field of view angiographies
  Finished. Score: 10/10.

- **Valeria del Río, Marcos Fracchia**, 2016–2017, Software Engineering thesis (director)
  Thesis topic: Feature engineering for retinal blood vessel segmentation in fundus images
  Finished. Score: 10/10.

- **Carmen Escudero Leoz, Manuel Corrales**, 2014, Software Engineering thesis (co-advisor)
  Thesis director: Mariana del Fresno
  Thesis topic: Integrating fuzzy c-means and deformable models for 3D medical image segmentation.
  Finished. Score: 10/10.

GRANTS AND FUNDING AWARDED

PICT 2021-00023. "*retinar: artificial intelligence for computer-aided diagnostic of diabetic retinopathy*"

- Proyectos de Investigación Científica y Tecnológica PICT 2021 Start-Up (FONCyT, Agencia I+D+i, Ministerio de Ciencia, Tecnología e Innovación).
  Project leader.
  Budget awarded: AR$ 2.700.000.

PIP GI 2021-2023 - 11220200102472CO. "*yatiris++: artificial intelligence for clinical applications based on medical images*"

Proyectos de Investigación Plurianuales de CONICET para grupos de investigación.
Project leader
Grant: AR$ 1.320.000.

NVIDIA Hardware Grant. "*Self-supervised learning for phenotyping glaucoma from color fundus photographs*"

Project leader
Grant: 400 hours on V100 GPU instances via SaturnCloud.

PN 376/2021. PAC Emprendedores para la Innovación. "*retinar*"

Non-refundable contribution granted by Secretaría de la Pequeña y Mediana Empresa y de los Emprendedores from Ministerio de Desarrollo Productivo (Argentina) to aid start-up companies to develop their products.
Project leader
Grant: AR$ 1.173.000. Counterpart amount: AR$ 207.000.

NVIDIA Applied Research Accelerator Program. "*retinar: assisting remote diabetic retinopathy screening with AI tools*"

NVIDIA program to collaborate in projects focused on technology transfer.
Project leader.
Award: 500 hours on V100 GPU instances via SaturnCloud.

PICT 2019-00070. "*Characterization of optic nerve head morphology from color fundus pictures using deep learning*"

Proyectos de Investigación Científica y Tecnológica PICT 2019 Joven Investigador (FONCyT, Agencia I+D+i, Ministerio de Ciencia, Tecnología e Innovación).
Project leader.
Budget awarded: $ 475.000.

03-JOVIN-37C. "Towards a smart platform for remote diabetic retinopathy screening: quality control in fundus photographs using autoencoders"

Convocatoria Jóvenes Investigadores JOVIN 2020/2021 (Programa de Fortalecimiento a la Ciencia y la Tecnología en Universidades Nacionales, Secretaría de Ciencia, Arte y Tecnología, UNICEN).
Project leader.

Budget awarded: AR$ 100.000.

Kaggle Open Data Research Grant 2020. "Weakly-supervised Abdominal Ultrasound Segmentation using Simulated Scans and Cycle-Consistency based Generative Models"

Kaggle Open Data Research Grant, donated by Google Kaggle.
Project leader.
Budget awarded: U$D 2.000.

NVIDIA Hardware Grant. "Deep learning based segmentation of the photoreceptor layers in Spectral Domain Optical Coherence Tomography scans"

NVIDIA Hardware Grant, donated by NVIDIA Inc.
Project leader.
NVIDIA GTX Titan Xp (approx. price: €1.000).

MEMBERSHIP IN OTHER RESEARCH PROJECTS

Generative Networks for Interactive 2D/3D Design and Multiview Synthesis, 2020-2021

PID UTN SIUTNBA0005534.
Research associate.
Project leader: Dr. Emmanuel Iarussi.

CrossMatch: Detection of Cross-Domain Matchings in Sketches using Deep Learning, 2019-2019

PICT 2018-4517 (ANPCyT, Secretaría de Gobierno de Ciencia, Tecnología e Innovación Productiva, Ministerio de Educación, Ciencia y Cultura de la Nación, Argentina)
Research associate.
Project leader: Dr. Emmanuel Iarussi.

CrossMatch: Detection of Cross-Domain Matchings using Deep Learning, 2018-2020

Project SIUTNBA0005139 (Universidad Tecnológica Nacional - Regional CABA (UTN), Argentina)
Research associate.
Project leader: Dr. Emmanuel Iarussi.

HI-MED: Computational tools applied to image quantification, simulation and treatment planning in medicine, 2016-2019

PICT 2016-0116 (ANPCyT, Ministerio de Ciencia, Tecnología e Innovación Productiva, Argentina)
Research associate.
Project leader: Dr. Ignacio Larrabide.

Machine learning applied to detection and classification of emergency situations in remote sensing images, 2017-2018

Project A3SIS (Ministry of Defense, Argentina)
Research associate.
Project leader: Dr. Lucas Lo Vercio.

Development of models and applications for simulation, optimization, computer graphics and image processing, 2014-2018

Project 03/C259 (SPU, Ministry of Education, Argentina)
Research associate.
Supervisor: Dr. Mariana del Fresno.
Project leader: Dr. Marcelo Vénere.

Imaging and simulation models for vascular disease diagnosis and treatment, 2014-2016

PICT 2014-1730 (National Agency of Scientific and Technological Promotion, Ministry of Science, Argentina)
Research associate.
Supervisors: Dr. Mariana del Fresno and Dr. Matthew B. Blaschko.
Project leader: Dr. Ignacio Larrabide.

National strategy of articulation between the university and the secondary school for generating vocations and improving engineering and science education, 2014-2016

PCTI 121 (Ministry of Science, Argentina)
Collaborator.
Project leader: Prof. Mabel Pacheco.

3D digital image processing and segmentation for developing medical and industrial applications, 2013-2014

PICT 2010-1287 (National Agency of Scientific and Technological Promotion, Ministry of Science, Argentina)
Research associate.
Supervisor: Dr. Mariana del Fresno.
Project leader: Dr. Marcelo Vénere.

AWARDS

Magna Cum Laude Prize at CADI 2022

- Prize for the best poster at the Argentinian Conference of Diagnostic Imaging 2022 (CADI 2022), organized by the Argentine Society of Radiology, with the abstract "SIMECO: A realistic ultrasound simulator based on ray-tracing algorithms and artificial intelligence", S. Vitale, *J.I. Orlando*, E. Iarussi, A. Díaz and I. Larrabide.

Award of the National Academy of Medicine 2021.

- The National Academy of Medicine of Argentina awards the best original work made in Argentina on scientific and medical topics. In 2021 it was focused in Artificial Intelligence in Medicine. We were awarded for oOur work entitled "Development of a national artificial intelligence model for referable diabetic retinopathy screening from fundus photographs"("Desarrollo de un modelo de inteligencia artificial nacional para el tamizado de casos de retinopatía diabética referible a partir de fotografías de fondo de ojo"), authored by J.I. Orlando, T. Castilla, A. Koch, M . Martínez, M. Leguía e I. Larrabide.

First Prize Oral Presentations at CNO22.

- First prize for the best oral presentation at the National Congress of Ophthalmology 2022 (CNO22), organized by the Argentine Council of Oftalmology, with the abstract Retrospective evaluation of a first argentinian artificial intelligence model for automated screening of referrable diabetic retinopathy from color fundus photographs", J.I. Orlando, T. Castilla, A. Koch, I. Larrabide, M . Martínez y M. Leguía.

Prendete 2020. Start-ups contest (http://prendete.co/).

- Member of retinar (https://retinar.com.ar/en/), one of the 15 projects selected as finalist among 130 initiative, and awarded for being the most voted by the public.

MICCAI Society

- MICCAI 2014 Student Travel Award.

Network of Software Engineering / Information Systems (RIISIC)

- Best paper award on students session, with the paper "Un enfoque de superficies activas basado en texturas para la segmentación de tumores en MRI cerebrales", J.I. Orlando, H.L. Manterola, E. Ferrante, and M. del Fresno.

Argentine Council of Engineering (CAI)

- Best engineering thesis, entitled "Segmentación de imágenes médicas tridimensionales basada en indicadores de texturas".

SCHOLARSHIPS AWARDED

- Ph.D. scholarship, Consejo Nacional de Investigaciones Científicas y Técnicas (National Council of Scientific and Technological Research), CONICET, Argentina. April 2013 to March 2018.
- Internship grant, Institut National de Recherche en Informatique et Automatique, INRIA, France. Équipe GALEN, INRIA Saclay, Palaiseau, France, and Center for Learning and Visual Computing, École Centrale Paris, France. Advisor: Dr. Matthew B. Blaschko. 6 months.
- Undergraduate research trainee scholarship, Comisión de Investigaciones Científicas de la Provincia de Buenos Aires, CIC-PBA, Argentina. Advisor: Dr. Mariana del Fresno. 4 months.

EVALUATION

Evaluation Committee CONICET

- 2021. External Especialist in evaluation for Convocatoria PIP 2021-2023 Grupo Investigación.
- 2020. Evaluator of Ingreso a la Carrera de Investigador Científico CONICET 2020 for the committee INGENIERÍA CIVIL, ELÉCTRICA, MECÁNICA E ING. RELACIONADAS PARA INGRESOS CIC.

Evaluation of research personnel

- 2021. Evaluator of 5 final reports of undergrad students who got a CIN Training-in-Research Scholarship in 2017. Secretaría de Ciencia, Arte y Tecnología, UNICEN.

Doctoral thesis

- 2022. Member of the examination committee of the PhD thesis of Bioeng. Agostina Larrazabal. Doctorado en Ingeniería, Mención Inteligencia Computacional, Señales y Sistemas. Facultad de Ingeniería y Ciencias Hídricas, Universidad Nacional del Litoral. Supervisors: Dr. César Martínez, Dra. Cecilia García Cena.

Final projects and bachelor thesis

- 2020. Evaluator of thesis of M.S. Software Engineering, Facultad de Ciencias Exactas, UNICEN. Student: Valeria LUCHESSI. Supervisor: Dr. José Massa.

ACADEMIC SERVICE

Scientific commitees

- Program Commitee: 18th INTERNATIONAL SYMPOSIUM ON MEDICAL INFORMATION PROCESSING AND ANALYSIS (SIPAIM), Valparaíso, Chile, 9-11 Noviembre, 2022.
- Program Commitee: 22do Congreso de Bioingeniería (SABI), Piriápolis, Uruguay, 4-6 March, 2020.
- Program Commitee: LatinX in AI Research at NeurIPS 2019, Vancouver, Canada, 9 December, 2019.
- Organizer: Pathologic Myopia Challenge (PALM), at ISBI'19. Venice, Italy, 8 April, 2019.
- Scientific Commitee: Workshop on GRaphs in biomedicAl Image anaLysis (GRAIL), at MICCAI'18. Granada, Spain, 20 September, 2018.
- Organizer: Retinal Fundus Glaucoma Challenge (REFUGE), at MICCAI'18. Granada, Spain, 20 September, 2018.
- Program Commitee: Learning with Limited Data (LLD) workshop, at NIPS'17. Long Beach, CA, USA, 4th December, 2017.

- Scientific Commitee: Workshop on GRaphs in biomedicAl Image anaLysis (GRAIL), at MICCAI'17. Quebec, Canada, 14 September, 2017.
- Local Organizing Committee: 12th Symposium on Medical Information Processing and Analysis (SIPAIM'16), Tandil, Argentina, 5-7 December, 2016.

Referee Service

- The Lancet Digital Health.
- AISTATS 2021.
- MICCAI 2018, 2019, 2020, 2021.
- IEEE Journal of Biomedical and Health Informatics.
- ISBI 2020.
- ICLR Workshop on Learning with Limited labeled Data (LLD 2019)
- MIDL 2019, 2020.
- Computer Vision and Image Understanding
- Computer Methods in Biomechanics and Biomedical Engineering: Imaging & Visualization
- NIPS Workshop on Learning with Limited labeled Data (LLD 2017)
- MICCAI Workshop on GRaphs in biomedicAl Image anaLysis (GRAIL 2017)
- XXI Congreso Argentino de Bioingeniería (SABI 2017)
- *10th Indian Conference on Computer Vision, Graphics and Image Processing (ICVGIP 2016)*
- *IEEE Transactions on Medical Imaging*
- *Computerized Medical Imaging and Graphics*
- *Computer Vision and Image Understanding*
- *Journal of Imaging*

PROFESSIONAL MEMBERSHIPS

- MICCAI Society (2018)
- MICCAI Society (2014)
- Argentine Council of Engineering (Consejo Argentino de Ingenieros, CAI) (2013-2014)

OTHER MEETING ATTENDANCE

General Participant

- MACI 2015 (5th Conference on Applied, Computational and Industrial Mathematics). UNICEN, Tandil, Argentina. May 4-6 2015.
- 2nd Biomedical Image Analysis Summer School: Modalities, Methodologies and Clinical Research, Institut Henri Pointcaré, Paris, France, July 8-12, 2013.
- ECImag 2011. 4th School and Workshop on Image Sciences, August 8-12, 2011.
- Agile Open Tandil 2011. Conferences on Agile methods for Software Development. Latin America Community of Agile Methodologies. Tandil, Argentina. May 21, 2011.
- MACI 2011 (3th Conference on Applied, Computational and Industrial Mathematics). UNS, Bahía Blanca, Argentina. May 9-11, 2011.

LECTURES

IMAGE AI, International Meeting of the European Glaucoma Society in glaucoma and artificial intelligence, Leuven, Belgium. December 12, 2019

- Lecturer, "What's next in AI for glaucoma screening? The REFUGE challenge outcomes"

II CONECEX, 2nd National Conference of Engineering Students, UNICEN, Tandil, Argentina. May 31, 2014

- Lecturer, "From math to medical image analysis: computational models applied in diagnosis, treatment and monitoring diseases"

Shared workspace for students, Facultad de Ciencias Exactas, UNICEN, Tandil, Argentina.

- Lecturer, "Introduction to Software Developments degrees"

APPLICATION AREAS

Fundus and OCT imaging, Computer-assisted diagnosis of ophthalmic diseases, Automated screening.

LANGUAGES

Spanish

- Mother tongue.

English

- Fluent writing, reading and speaking.
- Anglia Proficiency Level test approved with distinctions.

French

- Fluent reading, intermediate writing and speaking.
- DELF A2 test with score 93/100.
- 6 months spent in France.

German

- Basic reading, writing and speaking.
- A1.1 level (abc Bildungszentrum, Vienna, Austria).
- 1 year and 9 months spent in Austria.

TECHNICAL ENGINEERING AND AI SKILLS

- Tools: Visual Studio Code, Git, Matlab/Octave, Scilab, R, UML, Trello.
- Programming Languages: Python (5 years), Matlab (5 years), Java, C++, SQL (mySQL, Oracle, Postgress), Unix shell scripting, Markdown.
- Computer Vision: Torchvision, OpenCV.
- Machine learning: Pytorch (5 years), Tensorflow (keras), MatConvNet, Scikit Learn, Matlab, Pandas.
- AI Research and planning: Identifying problems, gathering information from stakeholders (mostly clinicians), data recovery and curation, designing data annotation protocols, designing AI solutions for real world problems (mostly medical but also general computer vision/graphics too), establishing evaluation protocols, publishing results, consulting.

CITIZENSHIP

Argentina