Lucas Daniel Lo Vercio, Ph.D.

POSTDOCTORAL ASSOCIATE

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🏠 https://www.researchgate.net/profile/Lucas_Lo_Vercio | ⓞ https://github.com/lucaslovercio/ |
🔗 https://www.linkedin.com/in/lucas-lo-vercio/

Profile

I am a computer scientist with a strong background in mathematics, researching in medical and biological images analysis and machine learning. Furthermore, I am highly experienced in university-level teaching and mentoring in systems engineering. I consider myself a problem-solving professional in data science and imaging.

Education

Universidad Nacional del Centro de la Provincia de Buenos Aires (UNCPBA)   *Tandil, Argentina*
PH.D. IN COMPUTATIONAL AND INDUSTRIAL MATHEMATICS   *2012-2017*
- Thesis Title: Feature engineering and machine learning for intravascular ultrasound segmentation.
- Supervisors: Dr. Ignacio Larrabide and Dr. Mariana del Fresno (PLADEMA Research Institute).

UNCPBA   *Tandil, Argentina*
SYSTEMS ENGINEER   *2005-2011*
- Final project title: Multiresolution visulization of topographic meshes.
- Supervisors: Dr. Alejandro Clausse and Msc. Virginia Cifuentes (PLADEMA Research Institute).

UNCPBA   *Tandil, Argentina*
PROGRAMMER ANALYST   *2005-2010*

OTHER CERTIFICATIONS AND COURSES

2018	**Argentina National Space Activities Commission (CONAE),** Level 2: Introduction to SAR remote sensing
2017	**CONAE,** Introduction to Geospatial Technologies in Agriculture
2016	**CONAE,** SoPI I: Introduction to Remote Sensing

Experience

2018-date	**Postdoctoral associate, Eyes High Postdoctoral Fellow (2018-2020),** Department of Cell Biology & Anatomy, University of Calgary, Canada. Supervisors: Dr. Benedikt Hallgrímsson and Dr. Nils Forkert.
2017-2018	**Postdoctoral Fellow,** National Scientific and Technical Research Council (CONICET), Argentina
2012-2017	**PhD Fellow,** CONICET, Argentina
2012-2019	**Graduate Teaching Assistant,** Facultad de Ciencias Exactas, UNCPBA, Argentina
2011-2012	**Software Developer,** UNITECH S.A., Buenos Aires, Argentina
2009-2012	**Undergraduate Teaching Assistant,** Facultad de Ciencias Exactas, UNCPBA, Argentina

Skills

Programming Languages: Python (OpenCV, Tensorflow, scikit-image, scikit-learn), C/C++ (CUDA, OpenGL, VTK, ITK), Java, MATLAB, SQL, Assembly, Bash.

Machine Learning: SVMs, Random Forests, ECOC, CNNs, GANs.

Software: PyCharm, Microsoft Visual Studio, Visual Studio Code, Eclipse IDE; MATLAB; IBM Rational Software Architect; Paraview, 3DSlicer, ImageJ, Git/GitHub, MySQL, MySQL Workbench, LaTeX.

Image processing: Denoising, textural analysis, edge detection, segmentation (deformable models, graph-cut, U-net), registration (landmark-, intensity-, and segmentation-based).

Biomedical Imaging: Intravascular Ultrasound (IVUS), Common Carotid Artery Ultrasound (CCA US), Optical Coherence Tomography (OCT), Computed Tomography (CT), Optical Projection Tomography (OPT), micro–Computed Tomography (micro-CT), Light-Sheet Microscopy (LSFM).

Teaching Experience

2023	**MDSC 689.11 - Medical Imaging Applications,** Guest lecturer. Topics: Image registration, Machine Learning.	*UCalgary*
2022	**Workshop: Introduction to Image Processing using Open-Source Software,** Instructor. Topics: Filtering. Segmentation. 3DSlicer, Paraview, ITK, Python.	*UCalgary*
2018	**Technological Applications for Conservation,** Instructor. Topics: GPS, Geographic Information Systems, Image Processing.	*UNCPBA*
2014, 2015, 2017	**Medical Imaging workshop,** Teaching Assistant. Topics: Filtering, segmentation, quantification and registration of medical images.	*UNCPBA*
2009-2018	**Software Development Methodologies I,** Teaching Assistant. Topics: UML, UP, Agile software development. IBM Professional Qualification "RT011 - Modeling of Object-Oriented Systems with Rational"	*UNCPBA*
2016-2018	**Information Technologies for Organizations,** Teaching Assistant. Topics: Fundamentals of organizations, Business requirements, Git, CMMI.	*UNCPBA*
2011-2019	**Design of Compilers I,** Teaching Assistant. Topics: Symbols tables, lexical and syntactic analysis, YACC, Assembly language.	*UNCPBA*
2011	**Data Storage Structures,** Teaching Assistant. Topics: Data modeling (Entity-Relationship Diagrams, Normal Forms, Business Requirements) and data structures in secondary storage.	*UNCPBA*

Mentoring

2021	**Co-Supervisor of Honours thesis for the Bachelor in Health Sciences,** One (1) student	*UCalgary*
2020-2021	**Co-Supervisor of Summer Studentships,** Two (2) students	*UCalgary*
2017-2020	**Supervisor of Final Projects for the degree in Systems Engineer,** Four (4) students	*UNCPBA*
2017-2018	**Supervisor of Research Student Fellowships,** Two (2) students	*UNCPBA*

R&D Projects

The role of continuous phenotypic variation in structural defects of the face. National Institute of Health (NIH NIDCR R01-DE019638). 2022-2023. Personnel.

A3SIS: Machine learning for detection and classification in satellite images. Ministry of Defense (Argentina). PIDDEF 12/16. 2017-2019. Director/Vice director.

HI-MED - Computational tools for image quantification, simulation and planning of treatments in medicine. MINCyT-ANPCyT (Argentina). PICT 2016-0116. 2017-2018. Personnel.

Imaging and simulation for diagnosis and treatment of vascular diseases. MINCyT-ANPCyT (Argentina). PICT 2014-1730. 2015-2017. Personnel.

SIMECO - Ultrasound simulator for medical training. PDTS-PCTI-158, Ministry of Science, Technology and Innovation (Argentina). 2014. Consultant - programmer.

Languages

Spanish (Native language)

English (CELPIP October 2022)

Awards, Fellowships, & Grants

2015	**Student Scholarship to attend to CARS 2015**, International Society for Computer Aided Surgery.	*€1,000*
2017-2018	**Post-Doctoral Fellowship**, CONICET	
2012-2017	**Doctoral Fellowship**, CONICET	
2007	**2nd Place - Student project**, Jornadas Argentinas de Informática.	

Scientific Community

2017-date	**Reviewer,** Journals: Ultrasonics, Computers in Biology and Medicine, Medical Physics, BioMedical Engineering OnLine, Methods in Ecology and Evolution, International Journal for Numerical Methods in Biomedical Engineering, Physics in Medicine and Biology, Ultrasonic Imaging, Journal of Neural Engineering, GigaScience, Medical Image Analysis.
2021-date	**Member,** Red de Científicos Argentinos en Canadá
2017	**Session Chair: Computer Vision,** VI Congreso de Matemática Aplicada, Computacional e Industrial. Comodoro Rivadavia, Argentina
2016	**Local organizing committee member. Student Poster Session Organizer.,** 12th International Symposium on Medical Information Processing and Analysis (SIPAIM 2016). Tandil, Argentina
2009	**Local organizing committee member,** XVIII Congreso sobre métodos numéricos y sus aplicaciones. Tandil, Argentina

Departamental Services

2021	**Judge,** McCaig Institute Summer Student Symposium, University of Calgary, Canada
2019-2020, 2021-2022	**Postdoctoral representative,** McCaig Institute Trainee Committee, University of Calgary, Canada
2015-2018	**Member of various Teaching Assistant selection committees,** Facultad de Ciencias Exactas, UNCPBA, Argentina
2015-2017	**Member of various Final Project evaluation committees,** Facultad de Ciencias Exactas, UNCPBA, Argentina

Publications

PEER-REVIEWED JOURNAL ARTICLES
‡ *denotes co-first authors*

Bethany N. Radford, Xiang Zhao, Tali Glazer, Malcolm Eaton, Danielle Blackwell, Shuhiba Mohammad, **Lucas Daniel Lo Vercio**, Jay Devine, Tali Shalom-Barak, Benedikt Hallgrímsson, James C. Cross, Henry M. Sucov, Yaacov Barak, Wendy Dean, Myriam Hemberger. *Defects in placental syncytiotrophoblast cells are a common cause of developmental heart disease.* Nature Communications. 2023; 14(1).

Lucas D. Lo Vercio, Rebecca M. Green, Samuel Robertson, Sienna Guo, Andreas Dauter, Marta Marchini, Marta Vidal-García, Xiang Zhao, Anandita Mahika, Ralph S. Marcucio, Benedikt Hallgrímsson, Nils D. Forkert. *Segmentation of Tissues and Proliferating Cells in Light-Sheet Microscopy Images of Mouse Embryos Using Convolutional Neural Networks.* IEEE Access. 2022; 11, 105084-105100.

Jay Devine, Marta Vidal-García, Wei Liu, Amanda Neves, **Lucas D. Lo Vercio**, Rebecca M. Green, Heather A. Richbourg, Marta Marchini, et al. *MusMorph, a database of standardized mouse morphology data for morphometric meta-analyses.* Scientific Data. 2022.

Nicolas Toussaint, Yushi Redhead, Marta Vidal-García, **Lucas Lo Vercio**, Wei Liu, Elizabeth M. C. Fisher, Benedikt Hallgrímsson, Victor L. J. Tybulewicz, Julia A. Schnabel, Jeremy B. A. Green. *A landmark-free morphometrics pipeline for high-resolution phenotyping: application to a mouse model of Down syndrome.* Development. 2021; 148(18).

Marta Marchini‡, Diane Hu‡, **Lucas Lo Vercio**, Nathan M. Young, Nils D. Forkert, Benedikt Hallgrímsson, Ralph Marcucio. *Wnt Signaling Drives Correlated Changes in Facial Morphology and Brain Shape.* Frontiers in Cell and Developmental Biology. 2021.

Jay Devine, Jose D. Aponte, David C. Katz, Wei Liu, **Lucas D. Lo Vercio**, Nils D. Forkert, Ralph Marcucio, Christopher J. Percival, Benedikt Hallgrímsson. *A Registration and Deep Learning Approach to Automated Landmark Detection for Geometric Morphometrics.* Evolutionary Biology. 2020; 47, 246–259.

Lucas Lo Vercio, Mariana del Fresno, Ignacio Larrabide. *Lumen-intima and media-adventitia segmentation in IVUS images using supervised classifications of arterial layers and morphological structures.* Computer Methods and Programs in Biomedicine. 2019; 177, 113-121.

Hugo Luis Manterola, **Lucas Lo Vercio**, Alejandro Díaz, Mariana del Fresno, Ignacio Larrabide. *Validation of an Open-Source Tool for Measuring Carotid Lumen Diameter and Intima–Media Thickness.* Ultrasound in Medicine & Biology. 2018; 44(8), 1873-1881.

Alejandro Diaz, Daniel Bia, Yanina Zócalo, Hugo Manterola, Ignacio Larrabide, **Lucas Lo Vercio**, Mariana Del Fresno, Edmundo Cabrera Fischer. *Carotid Intima Media Thickness Reference Intervals for a Healthy Argentinean Population Aged 11–81 Years.* International Journal of Hypertension. 2018.

Lucas Lo Vercio, José Ignacio Orlando, Mariana del Fresno, Ignacio Larrabide. *Assessment of image features for vessel wall segmentation in intravascular ultrasound images.* International Journal of Computer Assisted Radiology and Surgery. 2016; 11, 1397–1407.

Tutorials and Literature reviews

Lucas Lo Vercio, Kimberly Amador, Jordan J. Bannister, Sebastian Crites, Alejandro Gutierrez, M. Ethan MacDonald, Jasmine Moore, Pauline Mouches, Deepthi Rajashekar, Serena Schimert, Nagesh Subbanna, Anup Tuladhar, Nanjia Wang, Matthias Wilms, Anthony Winder, Nils D. Forkert. *Supervised machine learning tools: a tutorial for clinicians.* Journal of Neural Engineering. 2020; 17 (6).

Peer-Reviewed Conference papers

Lucas Lo Vercio, Mariana Del Fresno, Ignacio Larrabide. *Detection of morphological structures for vessel wall segmentation in IVUS using random forests.* Proc. SPIE 10160, 12th International Symposium on Medical Information Processing and Analysis. 2017.

Hugo Luis Manterola, **Lucas Lo Vercio**, Alejandro Díaz, Pamela Alejandra Pardini, María Victoria Waks Serra, Mariana del Fresno, Ignacio Larrabide. *Low-cost phantoms for validating measurements in ultrasound vascular images.* Proc. SPIE 10160, 12th International Symposium on Medical Information Processing and Analysis. 2017.

Juan P. D'Amato, **Lucas Lo Vercio**, Pablo Rubi, Ezequiel Fernandez Vera, Rosana Barbuzza, Mariana Del Fresno, Ignacio Larrabide. *Efficient scatter model for simulation of ultrasound images from computed tomography data.* Proc. SPIE 9681, 11th International Symposium on Medical Information Processing and Analysis. 2015.

Lucas Lo Vercio, Javier Dottori, Ignacio Larrabide, Jose Luis Díez-Gil, Mariana del Fresno, Pablo Lotito. *Guidewire artifact tracking on IVUS.* V MACI. Tandil, Buenos Aires, Argentina. 2015.

Hugo Manterola, **Lucas Lo Vercio**, Mariana del Fresno. *Reducing Artifacts Impact on IVUS Automatic Segmentation Via Inpainting.* Mecánica Computacional. 2014. 33 (41).

Presentations

Conference talks
Conference Papers mentioned before were presented, but omitted here. *presenting author; [+] mentored undergraduate*

Lucas Lo Vercio[*], Rebecca Green, Andreas Dauter, Elizabeth Barretto, Marta Marchini, Marta Vidal-García, Samuel Robertson, Anandita Mahika, Alejandro Gutierrez, Sienna Guo, Xiang Zhao, Ralph Marcucio, Nils Forkert, Benedikt Hallgrímsson. *Deep Learning for Automatic Analysis of Light-Sheet Microscopy Images of Mouse Embryos.* Poster. 8th Meeting of the European Society for Evolutionary Developmental Biology. May 2022. Napoli, Italy.

Rebecca M. Green[*], **Lucas Lo Vercio**, Sienna Guo, Andreas Dauter, Marta Marchini, Xiang Xhao, Ralph S. Marcucio, Benedikt Hallgrímsson. *Mapping the relationship between proliferation and morphology in the developing mouse face.* Experimental Biology. April 2020. Virtual.

Carolina Bruscantini[+,*], **Lucas D. Lo Vercio**, Pablo Rinaldi. *Correction of Digital Elevation Models based on Radar, using Landsat Imagery and Machine Learning.* Lecture Presentation. XII Argentinian Congress of Agroinformatics (CAI 2020). 2020. La Plata, Argentina.

Eugenia Moris[+,*], **Lucas D. Lo Vercio**, Ignacio Larrabide. *Automatic detection of morphological structures in Intravascular Ultrasound images with Convolutional Neural Network.* Lecture Presentation. Computer Assisted Radiology and Surgery Congress. 2019. Rennes, France.

Lucas Lo Vercio[*], José Ignacio Orlando, Mariana del Fresno, Ignacio Larrabide. *Assessment of image features for vessel wall segmentation in intravascular ultrasound images.* Poster and short presentation. Computer Assisted Radiology and Surgery Congress. 2015. Barcelona, Spain.

INVITED TALKS

May 2018. *Machine Learning for Image Processing.* Invited talk: 1st Workshop Red argentina de neuroimágenes y mapeo cerebral. Florencio Varela, Argentina.

June 2017. *Computer-aided diagnosis using ultrasound imaging.* Invited talk: Post-secondary Education, Science and Technology. Coronel Vidal, Argentina.