J. Matías Di Martino

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- Birth: *Montevideo, 1987*
- Citizenship: *Uruguayan, Italian*
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Short bio: I am Chief Scientific Officer at the Centro Nacional de Inteligencia Artificial, Full Professor at Universidad Catolica del Uruguay, Assistant Adjunct Professor at Duke University, Visiting Research Collaborator at Princeton University, and consultant for several AI companies. I have researched, educated, and provided professional consulting on machine learning, computer vision, and applied math. I taught undergraduate (1000+) and graduate (10+) students at the university level in Uruguay, the US, and France; led research projects, and published over 80 peer-reviewed scientific papers in the top venues on my field (h-index 21, 1800+ citations). I have experience co-leading large scale research and industry projects, and I am passionate about developing and applying AI to real world problems. As key personnel and PI I contributed to secure over 15M$ in research funds. For more information, please visit my web: matiasdimartino.com.

Education

- **Postdoc in Computer Vision and Machine Learning** (2018-2019) *Duke University, US.* ECE.
- **PhD in Engineering and Signal Processing** (2011-2015) *Universidad de la Republica, Montevideo, Uruguay.*
- **Degree in Electrical Engineering** (2005-2011) *Universidad de la Republica, Montevideo, Uruguay.* Ranking: 1/164.

Roles and positions

- **Chief Scientific Officer** (2026-present) *Centro Nacional de Inteligencia Artificial, Uruguay.*
- **Department Chair** (2025-2026) *Universidad Catolica del Uruguay.* Informatics and AI.
- **Full Professor** (2024-present) *Universidad Catolica del Uruguay.* Informatics and AI.
- **Assistant Adjunct Professor** (2024-present) *Duke University* ECE.
- **Consultant** (2017-present) *I can provide details upon request*
- **Visiting Research Collaborator** (2024-present) *Princeton University* ECE.
- **Assistant Research Professor** (2019-2024) *Duke University, US.* ECE.
- **Visiting Professor** (2019-2023) *UdelaR.* Physics and ECE.
- **Assistant Professor** (2016-2019) *UdelaR.* Physics.
- **Chercheur Associe** (2015-2016) *Ecole Normale Superieur Paris-Saclay* CMLA.
- **Teaching and Research Assistant** (2011-2016) *UdelaR* Physics and ECE. Prior: Teaching assistant in ECE (2009-2011), and Teaching assistant in Physics (2007-2011).

Fellowships

- **Researcher level II SNI** (level I 2014-2024, and level II 2024-present).
- **Researcher level 4 PEDECIBA (Computer Science)** (2015-present)
- **IPOL Editorial board** (2018-2023).
- **Wilson Center** Governance Board for Uruguay (2024-present).

Coding skills and consulting experience

I have over 15 years of experience researching, designing, and deploying machine learning solutions. I have experience working with classical pattern recognition algorithms (e.g., decision trees, SVMs) as well as modern deep learning solutions. I am an expert on the development and implementation of large scale research projects to improve medical outcomes leveraging computer vision and machine learning. In addition, I have extensive experience in developing image processing and 3d computer vision algorithms (see list of publications for details). I worked as consultant for private and public companies including Pento, Pyxis, Restor3d, and Microsoft.

Research

I have 1800+ citations, h-index 21, and published over 80 full papers in peer-reviewed international journals and conferences. My research includes the areas of health, machine learning, image processing, and optics. Please visit my google scholar profile for the most updated version of my full list of publications.

Full List of journal publications

1. Oded Schlesinger, Young Kyung Kim, **J. Matias Di Martino**, and Guillermo Sapiro. "CLARO: Controlled Attribute-Driven Reasoning Optimization for Efficient Chain-of-Thought." Findings of the Association for Computational Linguistics, (2026).
2. Oded Schlesinger, Amirhossein Farzam, **J. Matias Di Martino**, and Guillermo Sapiro. "SPOT: Sparsification with Attention Dynamics via Token Relevance in Vision Transformers." IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) Findings, (2026).
3. Dmitry Isaev, Savannah Major, Kimberly L.H. Carpenter, Jessica Grapel, Zhuoqing Chang, **J. Matias Di Martino**, David Carlson, Geraldine Dawson, and Guillermo Sapiro. "Use of Computer Vision Analysis for Labeling Inattention Periods in EEG Recordings With Visual Stimuli." Scientific Reports, (2025).
4. Ariel E. Stassi, **J. Matias Di Martino** and Gregory Randall, "A Brief Review and Analysis of Two Methods for Automatic Sign Language Segmentation," Image Processing On Line, 15 (2025). https://doi.org/10.5201/ipol.2025.560
5. Yuzhou Zhao, **J. Matias Di Martino**, Amirhossein Farzam, and Guillermo Sapiro. "FoldDiff: Folding in Point Cloud Diffusion." Transactions on Machine Learning Research, (2025).
6. Vikram Aikat, Kimberly LH Carpenter, Pradeep Raj Krishnappa Babu, **J. Matias Di Martino**, Steven Espinosa, Scott Compton, Naomi Davis, Lauren Franz, Marina Spanos, Guillermo Sapiro, Geraldine Dawson. "Autism Digital Phenotyping in Preschool and School Age Children." Journal of the International Society for Autism Research. (2025).
7. Lauren Franz, Mande Viljoen, Shelley Askew, Maura Brown, Geraldine Dawson, **J. Matias Di Martino**, Guillermo Sapiro, Kefiloe Sebolai, Nicole Seris, Nontobeko Shabalala et al. "Autism Caregiver Coaching in Africa (ACACIA): Protocol for a Type 1-Hybrid Effectiveness-Implementation Trial." PLoS One, (2024).
8. Gianneschi, Julia R., Kara A. Washington, Julia Nicholas, Ilana Pilato, Sarah LeMay Russell, Alannah M. Rivera Cancel, **J. Matias Di Martino** et al. "Assessing fears of negative consequences in children with symptoms of avoidant restrictive food intake disorder." International Journal of Eating Disorders, (2024).
9. Oded Schlesinger, Raj Kundu, Dmitry Isaev, Jessica Y Choi, Stefan M Goetz, Dennis A Turner, Guillermo Sapiro, Angel V Peterchev, and **J. Matias Di Martino**. "Scalp Sur-

face Estimation and Head Registration Using Sparse Sampling and 3D Statistical Models." Computers in Biology and Medicine, (2024).

10. Pradeep Raj Krishnappa Babu, **J. Matias Di Martino**, Rachel Aiello, Brian Eichner, Steven Espinosa, Jennifer Green, Jill Howard, Sam Perochon, Marina Spanos, Saritha Vermeer, Geraldine Dawson, and Guillermo Sapiro. "Validation of a Mobile App for Remote Autism Screening in Toddlers." New England Journal of Medicine, (2024).
11. Young Kyung Kim, **J. Matias Di Martino**, and Guillermo Sapiro. "Generalizing Neural Additive Models via Statistical Multi-modal Analysis." Transactions on Machine Learning Research, (2024).
12. Mercedes Marzoa Tanco, Guillermo Trinidad Barnech, Federico Andrade, Javier Baliosian, Martin LLofriu, **J. Matias Di Martino**, and Gonzalo Tejera. "MAgro Dataset: A Dataset for SLAM in Agricultural Environments." The International Journal of Robotics Research, (2024).
13. Sam Perochon, **J. Matias Di Martino**, Kimberly LH Carpenter, Scott Compton, Naomi Davis, Brian Eichner, Steven Espinosa, Lauren Franz, Pradeep Raj Krishnappa Babu, Guillermo Sapiro, Geraldine Dawson. "Early Detection of Autism Using Digital Behavioral Phenotyping." Nature Medicine, (2023).
14. Oded Schlesinger, Raj Kundu, Steffan Goetz, Guillermo Sapiro, Angel Peterchev, and **J. Matias Di Martino**. "Automatic Neurocranial Landmarks Detection from Visible Facial Landmarks Leveraging 3D Head Priors." Clinical Image-Based Procedures, Fairness of AI in Medical Imaging, and Ethical and Philosophical Issues in Medical Imaging, Lecture Notes in Computer Science, vol 14242, Springer, (2023).
15. Dmitry Yu Isaev, Maura Sabatos-DeVito, **J. Matias Di Martino**, Kimberly Carpenter, Rachel Aiello, Scott Compton, Naomi Davis, Lauren Franz, Connor Sullivan, Geraldine Dawson, Guillermo Sapiro. "Computer Vision Analysis of Caregiver-Child Interactions in Children with Neurodevelopmental Disorders: A Preliminary Report." Journal of Autism and Developmental Disorders, (2023).
16. Dmitry Yu Isaev, Roza M Vlasova, **J. Matias Di Martino**, Christopher D Stephen, Jeremy D Schmahmann, Guillermo Sapiro, Anoopum S Gupta. "Uncertainty of vowel predictions as a digital biomarker for ataxic dysarthria." The Cerebellum, (2023).
17. Marika Coffman*, **J. Matias Di Martino***, Rachel Aiello, Kimberly LH Carpenter, Zhuoqing Chang, Scott Compton, Brian Eichner, Steve Espinosa, Jacqueline Flowers, Lauren Franz, Sam Perochon, Pradeep Raj Krishnappa Babu, Guillermo Sapiro, Geraldine Dawson. "Relationship between quantitative digital behavioral features and clinical profiles in young autistic children." Autism Research, (2023). *Equal contribution.
18. Pradeep Raj Krishnappa Babu, Vikram Aikat, **J. Matias Di Martino**, Zhuoqing Chang, Sam Perochon, Steven Espinosa, Rachel Aiello, Kimberly LH Carpenter, Scott Compton, Naomi Davis, Brian Eichner, Jacqueline Flowers, Lauren Franz, Geraldine Dawson, Guillermo Sapiro. "Blink rate and facial orientation reveal distinctive patterns of attentional engagement in autistic toddlers: a digital phenotyping approach." Nature Scientific Reports, (2023).
19. Mercedes Marzoa, Gonzalo Tejera, **J. Matias Di Martino**. "Learning agriculture keypoint descriptors with triplet loss for visual SLAM." Journal of Ambient Intelligence and Humanized Computing, (2023).
20. Sam Perochon, **J. Matias Di Martino**, Kimberly Carpenter, Scott Compton, Naomi Davis, Steven Espinosa, Lauren Franz, Amber Rieder, Connor Sullivan, Guillermo Sapiro and Geraldine Dawson. "A Tablet-Based Game for the Assessment of Visual Motor Skills in Autistic Children." Nature NPJ Digital Medicine, (2023).
21. Pradeep Krishnappa Babu, **J. Matias Di Martino**, Zhuoquin Chang, Sam Perochon, Rachel

Aiello, Kimberly Carpenter, Scott Compton, Naomi Davis, Laurent Franz, Steven Espinosa, Jackeline Flowers, Geraldine Dawson, and Guillermo Sapiro. "Complexity analysis of head movements in autistic toddlers." Journal of Child Clinical Psychology and Psychiatry, (2022).

22. Pablo Massaferro, **J. Matias Di Martino**, and Alicia Fernandez, "Fraud Detection on Power Grids While Transitioning to Smart Meters by Leveraging Multi-Resolution Consumption Data." IEEE Transactions on Smart Grid, (2022).
23. Usamah N. Chaudhary, Cambre N. Kelly, Benjamin R. Wesorick, Cameron M. Reese, Ken Gall, Samuel B. Adams, Guillermo Sapiro, and **J. Matias Di Martino**. "Computational and Image Processing Methods for Analysis and Automation of Anatomical Alignment and Joint Spacing in Reconstructive Surgery." International Journal of Computer Assisted Radiology and Surgery, (2022).
24. Young Kyung Kim, **J. Matias Di Martino**, Julia Nicholas, Alannah Rivera-Cancel, Jennifer E. Wildes, Marsha D. Marcus, Guillermo Sapiro and Nancy Zucker. "Parent strategies for expanding food variety: Reflections of 19,260 adults with symptoms of Avoidant Restrictive Food Intake Disorder." International Journal of Eating Disorders, (2021).
25. Pradeep Raj Krishnappababu, **J. Matias Di Martino**, Zhuoqing Chang, Sam Perochon, Kimberly LH Carpenter, Scott Compton, Steven Espinosa, Geraldine Dawson, and Guillermo Sapiro. "Exploring Complexity of Facial Dynamics in Autism Spectrum Disorder." IEEE Transactions on Affective Computing, (2021).
26. Zhuoqing Chang, **J. Matias Di Martino**, Rachel Aiello, Jeffrey Baker, Kimberly Carpenter, Scott Compton, Naomi Davis, Brian Eichner, Steven Espinosa, Jacqueline Flowers, Lauren Franz, Adrianne Harris, Jill Howard, Sam Perochon, Eliana M. Perrin, Pradeep Raj Krishnappa Babu, Marina Spanos, Connor Sullivan, Barbara K. Walter, Scott H. Kollins, Geraldine Dawson, and Guillermo Sapiro. "Computational Methods to Measure Patterns of Gaze in Toddlers With Autism Spectrum Disorder." JAMA Pediatrics, (2021).
27. Sam Perochon, **J. Matias Di Martino**, Rachel Aiello, Jeffrey Baker, Kimberly Carpenter, Zhuoqing Chang, Scott Compton, Naomi Davis, Brian Eichner, Steven Espinosa, Jacqueline Flowers, Lauren Franz, Martha Gagliano, Adrianne Harris, Jill Howard, Scott H. Kollins, Eliana M. Perrin, Pradeep Raj, Marina Spanos, Barbara Walter, Guillermo Sapiro, and Geraldine Dawson. "A Scalable Computational Approach to Assessing Response to Name in Toddlers with Autism." Journal of Child Psychology and Psychiatry, (2020).
28. **J. Matias Di Martino**, Qiang Qiu, and Guillermo Sapiro. "Rethinking Shape from Shading for Spoofing Detection." IEEE Transactions on Image Processing, (2020).
29. **J. Matias Di Martino**, Fernando Suzacq, Mauricio Delbracio, Qiang Qiu, and Guillermo Sapiro. "Differential 3D Facial Recognition: Adding 3D to your State-of-the-Art 2D Method." IEEE Transactions on Pattern Analysis and Machine Intelligence, (2020).
30. Nicolas Casaballe, **J. Matias Di Martino**, Matias Osorio, Jose A. Ferrari, Thomas Wagner and Erna Frins. "Improved algorithm with adaptive regularization for tomographic reconstruction of gas distributions using DOAS measurements." Applied Optics, (2020).
31. Pablo Massaferro, **J. Matias Di Martino**, and Alicia Fernández. "Fraud Detection in Electric Power Distribution: An Approach that Maximizes the Economic Return." IEEE Transactions on Power Systems, (2019).
32. Jose A. Ferrari, Jorge L. Flores, Gaston A. Ayubi, **J. Matias Di Martino**, Cesar D. Perciante, Erna Frins. "Orientation-selective edge enhancement of phase objects." Optics Communications, (2019).
33. **J. Matias Di Martino** and Gabriele Facciolo. "An Analysis and Implementation of Multigrid Poisson Solvers With Verified Linear Complexity." Journal of Image Processing On Line (IPOL), (2018).

34. Jorge Flores, Gaston A. Ayubi, **J. Matias Di Martino**, Oscar E. Castillo, and José A. Ferrari. "3D-shape of objects with straight line-motion by simultaneous projection of color coded patterns." Optics Communications, (2018).
35. **J. Matias Di Martino**, Jorge Flores and José Ferrari. "One-shot 3D scanning by combining sparse landmarks with dense gradient information." Optics and Lasers in Engineering, (2018).
36. Nicolas Casaballe, Matias Osorio, **J. Matias Di Martino** and Erna Frins. "Comparison between regularized optimization algorithms for tomographic reconstruction of plume cross sections in the atmosphere." Earth and Space Science, (2017).
37. Jorge L. Flores, Gastón A. Ayubi, **J. Matias Di Martino**, César D. Perciante, Javier Carro, José A. Ferrari. "Hybrid ac-current sensor based on the time modulation of an autonomous light source." Optik, (2017).
38. Gaston A. Ayubi, Cesar D. Perciante, **J. Matias Di Martino**, Jorge L. Flores, and Jose A. Ferrari. "Generalized phase-shifting algorithms: error analysis and minimization of noise propagation." Applied Optics, (2016).
39. **J. Matias Di Martino**, Gabriele Facciolo, and Enric Meinhardt-Llopis. "Poisson Image Editing." Image Processing On Line, (2016).
40. César D Perciante, Marija Strojnik, Gonzalo Paez, **J. Matias Di Martino**, Gastón A Ayubi, Jorge L Flores, José A Ferrari. "Wrapping-free phase retrieval with applications to interferometry, 3D-shape profiling, and deflectometry." Applied Optics, (2015).
41. **J. Matias Di Martino**, Alicia Fernández, José A. Ferrari. "One-shot 3D gradient field scanning." Optics and Lasers in Engineering, (2015).
42. **J. Matias Di Martino**, Alicia Fernández and José A. Ferrari. "Gradient Domain Methods with application to 4D Scene Reconstruction." Optics and Lasers in Engineering, (2015).
43. Gastón A. Ayubi, César D. Perciante, Jorge L. Flores, **J. Matias Di Martino** and José A. Ferrari. "Generation of phase-shifting algorithms with N arbitrarily spaced phase-steps." Applied Optics, (2014).
44. **J. Matias Di Martino**, Alicia Fernández, Gastón A. Ayubi and José A. Ferrari. "Differential 3D shape retrieval." Optics and Lasers in Engineering, (2014).
45. Jorge L. Flores, García Torrales, José A. Ferrari, Gastón Ayubi, Oscar Ed. Castillo and **J. Matias Di Martino**. "Binary coded triangular fringes for 3D surface shape measurement." Applied Optics, (2013).
46. **J. Matias Di Martino**, Federico Decia, Juan Molinelli and Alicia Fernandez. "A novel framework for nontechnical losses detection in electricity companies." Pattern Recognition - Applications and Methods, (2013).
47. **J. Matias Di Martino**, Guzman Hernández, Marcelo Fiori, Alicia Fernandez. "A new framework for optimal classifier design." Pattern Recognition, (2013).
48. **J. Matias Di Martino**, Gaston Ayubi, Enrique Dalchiele, Julia R. Alonso, Ariel Fernandez, Jorge L. Flores, Cesar D. Perciante, and Jose A. Ferrari. "Single-shot phase recovery using two laterally separated defocused images." Optics Communications, (2013).
49. **J. Matias Di Martino**, Alicia Fernandez, Pablo Iturralde and Federico Lecumberry. "Novel Classifier Scheme for Imbalanced Problems." Pattern Recognition Letters, (2013).
50. Jorge L. Flores, Gastón A. Ayubi, Julia R. Alonso, Ariel Fernández, **J. Matias Di Martino** and José A. Ferrari. "Edge linking and image segmentation by combining optical and digital methods." Optik, (2013).
51. **J. Matias Di Martino**, J.L. Flores, F. Pfeiffer, K. Scherer, G.A. Ayubi, and J.A. Ferrari. "Phase retrieval from one partial derivative." Optics Letters, (2013).
52. Gastón A. Ayubi, **J. Matias Di Martino**, Julia R. Alonso, Ariel Fernandez, Jorge Flores and José A. Ferrari. "Color encoding of binary fringes for gamma correction in 3-D profiling."

Optics Letters, **37**(8)1325-1327 (2012).

53. **J. Matias Di Martino**, Jorge L. Flores, Gastón A. Ayubi, Julia R. Alonso, Ariel Fernández, and José A. Ferrari. "Edge enhancement of color images using a digital micro-mirror device." Applied Optics, **51**(16)3439-3444 (2012).
54. Gastón A. Ayubi, **J. Matias Di Martino**, Jorge L. Flores, and José A. Ferrari. "Binary coded linear fringes for three-dimensional shape profiling." Optical Engineering, (2012).
55. Gastón A. Ayubi, **J. Matias Di Martino**, Julia R. Alonso, Ariel Fernández, César D. Perciante and José A. Ferrari. "Three-dimensional profiling with binary fringes using phase-shifting interferometry algorithms." Applied Optics, (2011).
56. Ariel Fernández, Julia R. Alonso, Jorge L. Flores, Gastón A. Ayubi, **J. Matias Di Martino** and José A. Ferrari. "Optical processing of color images with incoherent illumination: orientation-selective edge enhancement using a modified liquid-crystal display." Optics Express, (2011).
57. Jorge L. Flores, Gastón A. Ayubi, Julia R. Alonso, Ariel Fernández, **J. Matias Di Martino** and José A. Ferrari. "Incoherent optical processor for nondirectional edge enhancement of color images." Optics Letters, (2011).
58. Gastón A. Ayubi, Jaime A. Ayubi, **J. Matias Di Martino**, and José A. Ferrari. "Pulse-width modulation in defocused three-dimensional fringe projection." Optics Letters, (2010).

Full List of publications in conferences proceeding

1. Ariel Stassi, Yanina Boria, **J. Matias Di Martino***, and Gregory Randall*. "iLSU-T: an Open Dataset for Uruguayan Sing Language Translation." 19th International Conference on Automatic Face and Gesture Recognition (2025). *Equal contribution.
2. Jennifer Green, Raj Kundu, Angel V. Peterchev, and **J. Matias Di Martino**. "Toward Accessible Neuronavigation: Tracking Retroreflective Markers with a Consumer-Grade Depth Camera." IEEE URUCON (2024).
3. Camilo Mariño, **J. Matias Di Martino**, and Alicia Fernández. "Non-Intrusive Disaggregation at a Very Low Frequency of Water Heaters and Electric Vehicles." IEEE PES Generation, Transmission and Distribution Latin America Conference (GTDLA 2024).
4. Camilo Mariño, **J. Matias Di Martino**, and Alicia Fernández. "Monitoreo No Intrusivo de Cargas utilizando Datos de los Medidores Inteligentes de la Red de UTE." IEEE URUCON (2024).
5. Pradeep Krishnappa Babu, **J. Matias Di Martino**, Kimberly LH Carpenter, Scott Compton, Naomi Davis, Brian Eichner, Steven Espinosa et al. "Large-scale Validation of a Scalable and Portable Behavioral Digital Screening Tool for Autism at Home." In Extended Abstracts of the CHI Conference on Human Factors in Computing Systems, pp. 1-7. 2024.
6. Vikram Aikat, Kimberly Carpenter, Pradeep Raj Krishnappa Babu, **J. Matias Di Martino**, Steven Espinosa, Scott Compton, Naomi Davis et al. "Consistency and Robustness of Computer Vision Analysis Based Biomarkers in School Age Autistic Children." INSAR 2024 (2024).
7. Franz, Lauren, **J. Matias Di Martino**, Rachel E. Aiello, Tara Chandrasekhar, Dandan Chen, Scott Compton, Naomi Davis et al. "Using a Digital Tool to Predict Level of Response to a Caregiver-Coaching Intervention for Autistic Children with Co-Occurring ADHD: An Exploratory Study." INSAR 2024 (2024).
8. Kara Washington, Elizabeth M. Monahan, Faith Joo, Ilana Pilato, Alannah M. Rivera-Cancel, Young Kyung Kim, Eli Rotondo, **J. Matias Di Martino**, Guillermo Sapiro and Nancy Zucker. "Feeling and Body Investigators (FBI): An Interoceptive Exposure Treatment Ap-

proach for Young Children With Avoidant/Restrictive Food Intake Disorder (ARFID)." In AACAP's 2024 Annual Meeting (AACAP 2024).

9. Aikat, Vikram, Pradeep Raj Krishnappa Babu, Kimberly LH Carpenter, **J. Matias Di Martino**, Steven Espinosa, Naomi Davis, Lauren Franz, Marina Spanos, Geraldine Dawson, and Guillermo Sapiro. "Digital Phenotyping based on a Mobile App Identifies Distinct and Overlapping Features in Children Diagnosed with Autism versus ADHD." In Adjunct Proceedings of the 37th Annual ACM Symposium on User Interface Software and Technology, pp. 1-4. 2024.
10. Gabriella Vivanti, Briana A. Toroni, Alexandra Brownell, Geraldine Dawson, **J. Matias Di Martino**, Steven Espinosa, Kristina Ference, Jacqueline Flowers, Rosa Librizzi, Guillermo Sapiro et al. "Feasibility of Building a Streamlined Birth Cohort to Examine Biomarkers Related to Autism in a Community-Based Health System." INSAR 2023 (2023).
11. Carolyn Stone, Elise Tenenbaum, **J. Matias Di Martino**, Anna Soderling, Kathryn Gustafson, William Malcolm, Kristin Fisher, Naomi Davis, Rachel E. Aiello, Saritha Vermeer et al. "Differences in Speech-like Vocalizations and Word Production Among Autistic, Neurotypical, and Premature Toddlers." INSAR 2023 (2023).
12. Elise Tenenbaum, Carolyn Stone, **J. Matias Di Martino**, Kathryn Gustafson, Kristin Fisher, William Malcolm, Kimberly Carpenter, Guillermo Sapiro, and Geraldine Dawson. "Behaviors Assessed Automatically Via Computer Vision Tools Are Linked to Autism in Toddlers and Infants Born Premature." INSAR 2023 (2023).
13. Vikram Aikat, Pradeep Raj Krishnappa Babu, **J. Matias Di Martino**, Zhuoqing Chang, Sam Perochon, Steven Espinosa, Rachel E. Aiello, Kimberly Carpenter, Scott Compton, Naomi Davis et al. "Blink Rate Reveals Distinctive Patterns of Attentional Engagement in Young Autistic Toddlers Via Digital Phenotyping Tool." INSAR 2023 (2023).
14. Young Kyung Kim, **J. Matias Di Martino**, and Guillermo Sapiro. "Generalizing Neural Additive Models via Statistical Multimodal Analysis." ICML Workshop on Interpretable Machine Learning in Healthcare, (IMLH 2023).
15. Oded Schlesinger, Raj Kundu, Stefan Goetz, Guillermo Sapiro, Angel V. Peterchev, and **J. Matias Di Martino**. "Automatic Neurocranial Landmarks Detection from Visible Facial Landmarks Leveraging 3D Head Priors." In Workshop on Clinical Image-Based Procedures, pp. 12-20. Cham: Springer Nature Switzerland, 2023.
16. Pablo Massaferro, **J. Matias Di Martino** and Alicia Fernandez. "NTL Detection: Optimization of Inspection Routes Weighing Mobility Cost and Detection Likelihood." Proceedings of the IEEE Power and Energy Society Innovative Smart Grid Technologies Conference (ISGT Latin America 2021).
17. Raphael Achddou, **J. Matias Di Martino**, and Guillermo Sapiro. "Nested Learning for Multi-Level Classification." Proceedings of the IEEE International Conference on Acoustics, Speech and Signal Processing, (ICASSP 2021).
18. Pablo Massaferro, **J. Matias Di Martino**, and Alicia Fernandez. "NTL Detection: Overview of Classic and DNN-Based Approaches on a Labeled Dataset of 311k Customers." Proceedings of the IEEE International Conference on Innovative Smart Grid Technologies, (ISGT 2021).
19. **J. Matias Di Martino**, Fernando Suzacq, Mauricio Delbracio, Qiang Qiu, and Guillermo Sapiro. "Differential 3D Facial Recognition: Adding 3D to your State-of-the-Art 2D Method." Proceedings of the IEEE International Conference on Computational Photography, (ICCP 2020).
20. Zhuoqing Chang, **J. Matias Di Martino**, Qiang Qiu, Steven Espinosa and Guillermo Sapiro. "SalGaze: Personalizing Gaze Estimation using Visual Saliency." Proceedings of the IEEE International Conference on Computer Vision Workshops, (ICCVW 2019).

21. Pablo Massaferro, Henry Marichal, **J. Matias Di Martino**, Fernando Santomauro, Juan Pablo Kosut and Alicia Fernández. "Improving electricity non technical losses detection including neighborhood information." 2018 IEEE Power and Energy Society General Meeting, (PESGM 2018).
22. Mercedes Marzoa, **J. Matias Di Martino** and Gonzalo Tejera. "Computer vision based system for apple detection in crops." 13th International Conference in Computer Vision Theory and Applications, (VISAPP 2018).
23. Marcelo Fiori, **J. Matias Di Martino** and Alicia Fernandez. "An optimal multiclass classifier design." 23rd International Conference on Pattern Recognition, (ICPR 2016).
24. **J. Matias Di Martino**, Alicia Fernández, and José A. Ferrari. "One-shot 3D-Gradient Method Applied to Face Recognition." Iberoamerican Congress on Pattern Recognition (CIARP 2015).
25. **J. Matias Di Martino**, Alicia Fernández, and José A. Ferrari. "Automatic Eyes and Nose Detection Using Curvature Analysis." Iberoamerican Congress on Pattern Recognition (CIARP 2015).
26. Federico Rodriguez, **J. Matias Di Martino**, Juan Pablo Kosut, Fernando Santomauro, Federico Lecumberry, and Alicia Fernández. "Optimal and Linear F-Measure Classifiers Applied to Non-technical Losses Detection." Iberoamerican Congress on Pattern Recognition (CIARP 2015).
27. **J. Matias Di Martino**, Alicia Fernández and José A. Ferrari. "3D curvature analysis with a novel one-shot technique." International Conference in Image Processing, (ICIP 2014).
28. **J. Matias Di Martino**, Federico Decia, Juan Molinelli and Alicia Fernandez. "Improving electric fraud detection using imbalance class strategies." International Conference on Pattern Recognition Applications and Methods, (ICPRAM 2012).

Preprints

1. Z. Xie, Oded Schlesinger, Raj Kundu, Jessica Y. Choi, Pablo Iturralde, Dennis A. Turner, Stefan M. Goetz, Guillermo Sapiro, Angel V. Peterchev, and **J. Matias Di Martino**. "Toward Accurate and Accessible Markerless Neuronavigation." arXiv:2602.07052, (2026).
2. Young Kyung Kim, Oded Schlesinger, Q. Wu, **J. Matias Di Martino**, and Guillermo Sapiro. "Order-Aware Test-Time Adaptation: Leveraging Temporal Dynamics for Robust Streaming Inference." arXiv:2601.21012, (2026).
3. Young Kyung Kim, Oded Schlesinger, Yuzhou Zhao, **J. Matias Di Martino**, and Guillermo Sapiro. "Chain-of-Image Generation: Toward Monitorable and Controllable Image Generation." arXiv:2512.08645, (2025).
4. Amirhossein Farzam, Oded Schlesinger, J.M. Susskind, **J. Matias Di Martino**, and Guillermo Sapiro. "The Geometry of Attention: Ricci Curvature and Transformers Training and Robustness." Preprint, (2025).
5. Young Kyung Kim, **J. Matias Di Martino**, and Guillermo Sapiro. "Vision Transformers with Natural Language Semantics." arXiv:2402.17863, (2024).

Grants and Awards

- **DAAD HAW.International (Germany)** (2026-2028), *STRATTT-Bridge: Sustainable Transformation for Research, Applied Learning, Transport, Tourism & Technology*, **role: Local-PI** (funded by the German Federal Ministry of Research, Technology and Space and DAAD).

- **ANII Fondo María Viñas** (2026-2029), *Monitoreo eficiente del territorio mediante la super-resolución de imágenes satelitales*, **role: PI** (Co-PI: Dr. Lara Raad).
- **Concurso de formento a la vinculacion internacional (CHILE)** (2025-2026), *Artificial Intelligence and Robotics for Remote and Proximal Sensing in Precision Agriculture*, **role: co-I** (PI: Rodrigo Verschae Tannenbaum).
- **THOMAS JEFFERSON FUND** (2022-2024), *Robust and interpretable multi-modal signal processing approaches for the screening, understanding and monitoring of neurodevelopmental and neurophysiological disorders*, **role: PI** (Co-PIs: Dr. Oudre).
- **NIH, 2P50-HD93074** (2022-2027), *A digital health approach to early identification and outcome monitoring in autism*, **role: co-I** (PIs: Dr. Sapiro and Dr. Dawson).
- **NIH, 1R01-MH129733-01** (2022-2027), *Accurate, low-cost, trackerless neuronavigation for transcranial magnetic stimulation*, **role: PI** (co-PI: Dr. Peterchev).
- **Duke Institute for Brain Sciences, Research Germinator Award** (2020-2021), *Accurate, affordable, and easy-to-use navigation for transcranial magnetic stimulation*, **role: co-I** (PIs: Drs. Peterchev, Sapiro, Goetz, and Turner).
- **NIH:R33-MH-121549** (2021-2024), *Feeling and Body Investigators (FBI)-ARFID Division: Sensory and Somatic Exposure for Children with Avoidant Restrictive Food Intake*, **role: co-I** (PIs: Drs. Zucker and Sapiro).
- **NIH:1R01-MH120093-02** (2019-2023), *Scalable Computational Platform For Active Closed-Loop Behavioral Coding in Autism Spectrum Disorder*, **role: co-I** (PI: Drs. Dawson and Sapiro).
- **UTE-UDELAR** (2021-2023), *Power disaggregation and identification via multi-scale information fusion*, **role: PI** (co-PI: Prof. Fernandez).
- **UTE - CSIC** (2018-2020), *Decoupling domestic electricity consumption*, **role: PI** (co-PI: Dr. Fernandez).
- **CSIC I+D** (2017-2019), *3D Reconstruction with structured light*, **role: PI** (co-PI: Dr. Ferrari).
- **CSIC PhD thesis award** (2015), *One-shot three-dimensional scene analysis.*
- **Graduated with the highest GPA in the class in the top engineering program of Uruguay** (2011).
- **CSIC** (2009-2010), *Métodos ópticos para el tratamiento de imágenes*, **role: PI**.

Teaching

I have 15+ years of teaching experience. I coordinated courses with more than a 1000 students. I also was responsible for undergraduate and graduate courses. I taught at: **Universidad Católica del Uruguay:** Deep Learning (2026), Deep Learning For Computer Vision (2024, 2025). **Duke University:** Data+ and Climate+ (2022), Image Processing (2021, 2022, 2023). **Universidad de la Republica:** 3D Vision (2017), Physics 1 (2011-2017), Newton Mechanics (2008-2010), Lagrangian Mechanics and Oscillations (2007-2009), Waves and Oscillations (2011, 2013 and 2014), Linear Circuits and Systems 1 (2010, 2011), Linear Circuits and Systems 2 (2010).

Invited Talks and Presentations

- *Computer Vision Based Neuronavigation* – NYC Neuromodulation Conference, NY, US (Jul. 2026).
- *Inteligencia Artificial* – Ateneos UCU Senior, Uruguay (Mar. 2026).
- *Computer Vision for Robotics* – LACORO, Chile (Keynote, Dec. 2025).

- *Modelando Humanos y su Comportamiento Mediante Visión Artificial* – CICADA, Montevideo (Nov. 2025).
- *Pasado, Presente y Futuro de la IA para Visión Automática* – Campus Party Uruguay (Keynote, Oct. 2025).
- *Recent advances in CV and Ongoing Research* – dsense Talks, Montevideo (Oct. 2025).
- *Recent advances in CV and Ongoing Research* – Pento Talks, Montevideo (Oct. 2025).
- *AI in Medicine and Ongoing Research* – IT Updates, Montevideo (Sep. 2025).
- *Learning Implicitly the Image Priors with Denoisers* – IFFI, Facultad de Ingeniería, Montevideo (Aug. 2025).
- *AI in Medicine and Ongoing Research* – UCU Maestría en Humanización de la Medicina, Montevideo (Jul. 2025).
- *AI: Associative memory or reasoning?* – Seminario de Optimización, Montevideo (Jun. 2025).
- *Computer vision based behavioral phenotyping* – Ceibal, Montevideo (May 2025).
- *Computer vision based behavioral phenotyping* – Kiphu (Mar. 2025).
- *Computer Vision: A Review with an Emphasis on Face Analysis* – Princeton Lecture, US (Feb. 2025).
- *Past and Present of CV and Research Opportunities / Contrastive Learning for Keypoint Detection* – LACORO, Chile (Dec. 2024).
- *Facial Analysis and Behavioral Phenotyping* – WACCI, Uruguay (Nov. 2024).
- *Past and Present of Computer Vision and New Opportunities* – Campus Party, Montevideo (Oct. 2024).
- *Denoisers Are Learning Implicitly the Image Priors* – Seminario de Optimización, Montevideo (Oct. 2024).
- *CV: A Review and Ongoing Research* – Tryolabs Talks, Montevideo (Sep. 2024).
- *AI en Uruguay* – UCU Alumni Trends, Montevideo (Sep. 2024).
- *Past and Present of Computer Vision and New Opportunities* – IT Builders, Montevideo (May 2024).
- *A Quick Intro to Detection and Localization* – UK-FAA Workshop, UK (Mar. 2024).
- *Ongoing Research in AI for Health* – Pento Talks, Montevideo (2024).
- *Computer Vision for Agricultural Applications* – NC State Agronomy, US (May 2023).
- *Computer Vision based behavioral phenotyping for autism* – Biostats Seminar, Duke University, US (2023).
- *PointNet – Journal Club* – Restor3D Talks, US (Oct. 2022).
- *Object Detection and Segmentation with Neural Networks* – Duke MLSS, US (Jun. 2022).
- *Autism Clinical Profiles in Behavioral Phenotyping* – INSAR 2022, US (Apr. 2022).
- *Introduction to Multiple View Geometry* – Curso de Visión, InCo, Uruguay (Apr. 2022).
- *NLP Workshop* – Duke Fuqua School of Business, US (2022).
- *Recent advances in AI for material sciences* – Duke AI & Materials Series, US (2022).
- *Computer Vision based Behavioral Phenotyping for Autism* – INSAR 2021, US (2021).
- *Recent advances in AI for health* – IFFI, Facultad de Ingeniería, UdelaR, Uruguay (2021).
- *Towards automatic TMS* – DIBS Incubator, Duke Institute for Brain Sciences, US (2021).
- *Computer Vision for 3D Scene Analysis* – Seminario IFFI, Facultad de Ingeniería, Uruguay (Apr. 2017).
- *Computer Vision for 3D Scene Analysis* – CICEA, UdelaR, Uruguay (Apr. 2017).
- *Active stereo based facial analysis* – Seminario IFFI, Facultad de Ingeniería, UdelaR, Uruguay (May 2016).

Postdoctoral fellows

Sam Perochon *Toward an agentic framework for the assessment and treatment of cardiovascular conditions.* Universidad Católica del Uruguay & Duke University. Co-advised with W. Aquino, 2026-2027.

PhD students

Nicolas Rondan *Point Cloud Deep Learning For 3D Facial Modeling and its Application to TMS neuronavigation.* PhD in Electrical Engineering, UCU. 2024-present.

Yuzhou Zhao *Point Cloud Deep Learning Based Modeling and Analysis.* PhD in Electrical Engineering, Duke University. Co-adviced with G. Sapiro 2023-present.

Ariel Stassi *Leveraging multimodal transformers for sign language interpretation.* PhD in Electrical Engineering, UdelaR. Co-adviced with G. Randall 2022-present.

Vikram Aikat *Computer Vision Based Behavioral Phenotyping and its Applications to Early Autism Detection.* PhD in Electrical Engineering, Duke University. Co-adviced with G. Sapiro 2021-present.

Oded Schlesinger *Trackerless TMS neuronavigation.* PhD in Electrical Engineering, UdelaR. Co-adviced with G. Sapiro 2022-present.

Yung Kyung *Interpretable deep learning models.* PhD in Electrical Engineering, Duke University. Co-adviced with G. Sapiro 2021-present.

Sam Perochon *Human analysis and CV-based behavioral phenotyping.* Hadamard Doctoral School of Mathematics (EDMH) Centre Borelli, ENS Paris-Saclay, Université Paris-Saclay. Co-adviced with G. Sapiro and Laurent Oudre 2021-2025.

Mercedes Marzoa *AI for agriculture.* PhD in Computer Engineering, UdelaR. Co-advised with Dr. Gonzalo Tejera (UdelaR, Uruguay), 2019-present.

Pablo Masaferro *Automatic NTL detection.* PhD in Electrical Engineering, UdelaR. Co-advised with Prof. Alicia Fernández (UdelaR), 2018-2021.

Master students

Martin Perciante *Scaling SOTA Models via Sparcification and Compression.* Master in Electrical Engineering, UCU. Co-adviced with M. Velasco, 2024-present.

Yuzhou Zhao *3D Point Cloud Low Dimensional Represetation.* Master in Electrical Engineering, Duke. 2023.

Rucha Patil *Detection Methods for Trackers in Transcranial Magnetic Stimulation.* Master in Electrical Engineering, Duke. 2023.

Camilo Mariño *Modeling costumers patterns of power consumption.* Master in Electrical Engineering, UdelaR. Co-advised with Prof. Alicia Fernández, 2020-2023.

Mercedes Marzoa *Image super-resolution.* Master in Computer Engineering, UdelaR. Co-advised with Dr. Andres Almansa (CNRS, France), 2017-2019.

Fernando Suzacq *Face analysis with implicit 3D features.* Master in Electrical Engineering. Co-advised with Dr. Mauricio Delbracio (UdelaR), 2017-2020.

Undergraduate students

Matías Ezequiel Cabrera, Ramón Agustín Lorenzo, Juan Martín Maidana *Estrategias para la Implementación Eficiente de Visión Automática e Inteligencia Artificial.* Universidad Católica del Uruguay, 2025.

Sebastián Cagiano, Mercedes Marzoa *Robótica Agropecuaria: Detección automática de frutos.* Universidad de la República, 2014.

Alejandro Rivero, Gaston Ayubi *Reconstrucción 3D en tiempo real.* Universidad de la República, 2014.

Thesis Committees

PhD committees

- **Anis Yassine Ben Mabrouk** (Université Paris-Saclay / ENS Paris-Saclay), *Multi-Object Tracking in Complex Scenarios: Benchmark, In-Depth Analysis, and Pair-Dependent Representations for Visual Similarity.* Rapporteur & Examiner, Nov. 2025.
- **Catalina María Galván** (Universidad Nacional del Litoral, Argentina), *Métodos de aprendizaje automático de mínima calibración para interfaces cerebro-computadora basadas en imaginería motora.* Committee member, 2025.
- **Jacob Evans Peloquin** (Duke University, Mechanical Engineering and Materials Science), *Accelerating the Mechanical Characterization of Hierarchical Materials via Machine Learning.* Committee member, Mar. 2025.
- **Matías Tailanián** (Universidad de la República, Uruguay), *Deep Image Generation Modeling and Statistical Testing for Industrial Anomaly Detection.* External reviewer, Sep. 2024.
- **Hadiya Harrigan** (Duke University, Mechanical Engineering and Materials Science), *Cardiovascular Health Classification Using Arterial Dispersion Ultrasound Vibrometry (ADUV).* Committee member, Mar. 2024.
- **Antoine Tadros** (Université Paris-Saclay / ENS Paris-Saclay), *Statistical Background Modeling and Applications in Remote Sensing.* Examiner, Nov. 2023.
- **Álvaro Gómez** (Universidad de la República, Uruguay), *Challenges of Multi-View Satellite Stereo Reconstruction Pipelines and Some Contributions on Key Stages.* External reviewer, Feb. 2023.
- **Antonio Parejo Matos** (Universidad de Sevilla / Università di Genova), *Application of Intelligent Techniques for Optimal Management of Weakly Connected Microgrids.* Committee member, 2022.
- **Martin Andrés Bertran Lopez** (Duke University, Electrical and Computer Engineering), *Robustness and Generalization Under Distribution Shifts.* Committee member, 2022.
- **Natalia Lucienne Martinez Gil** (Duke University, Electrical and Computer Engineering), *Minimax Fairness in Machine Learning.* Committee member, 2022.
- **Lun Huang** (Duke University, Electrical and Computer Engineering), *Multi-modal Representation Learning.* Qualifying exam committee, 2022.
- **Brady G. Taylor** (Duke University, Electrical and Computer Engineering), *CMOS and Emerging Nanodevice Circuits for Biologically-Plausible Learning in Efficient Neuromorphic Computing.* Preliminary exam committee, Mar. 2022.

- **Oded Schlesinger** (Duke University, Electrical and Computer Engineering), *Traffic Hazards Avoidance*. Qualifying exam committee, Apr. 2022.

MSc committees

- **Santiago Serantes** (Universidad de la República, Uruguay), *Optimizing Cloud Elasticity: A Deep Reinforcement Learning Approach Enhanced by Transfer Learning*. Committee member, Jun. 2025.
- **Fernanda Maldonado** (Universidad de la República, Uruguay), *Detección de pérdidas no técnicas de energía utilizando modelos de aprendizaje profundo para series temporales multivariadas*. Committee member, May 2024.

Undergraduate thesis evaluations

- **Julián O'Flaherty, Rodrigo Paganini, Juan Pablo Sotelo & Julieta Umpiérrez** (Universidad de la República; Academia Nacional de Ingeniería prize), *PhotoHolmes: Study and Implementation of Techniques for Detecting Forgeries in Digital Images*. Prize evaluator, Sep. 2024.

Professional Service

Peer review (journals): Nature Medicine, Nature NPJ Digital Medicine, Scientific Reports, Frontiers in Neuroscience, IEEE Transactions on Biomedical Engineering, IEEE Transactions on Power Systems, IEEE Transactions on TMS, Pattern Recognition, Pattern Recognition Letters, Journal of Mathematical Imaging and Vision, Behaviour & Information Technology, Image Processing On Line (IPOL), Optik, Óptica Aplicada.

Peer review (conferences): CVPR, AAAI, NeurIPS ML4H, ICPRS, IEEE URUCON, CIARP (2015), CLEI (2014).

Grant and project review: ANII FCE, grant reviewer and program committee (2026); ANII FMV (2023); NIH (2023-2024); CSIC UdelaR (2019); Academia Nacional de Ingeniería, project evaluator (2025); UCU internal funds, Fondos Semilla and Fondos Movilidad (2024-2025).

Internships and Research Visits

- **Research Intern**, TELECOM ParisTech, Paris, France (Jan.-Apr. 2014).
- **Research Intern**, TELECOM ParisTech, Paris, France. Image Processing group, collaboration with ONERA (Jan.-Apr. 2013).

Languages

Spanish: native. **English:** fluent. **French:** intermediate. **Italian:** basic.

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