Andrés C. Rodríguez, PhD

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PROFILE

I am a software developer specialized on **satellite image analysis** with **machine learning** models. I have several years of experience developing machine learning models with business partners on a project basis. My scientific publications showcase: (1) models that can deal with small and biased training datasets; (2) how to design **cost-saving labelling schemes** for large datasets, and (3) early use-cases of **generative models**. I am a **co-founder** of Kapok.ai, a start-up focused on machine learning models for agriculture and ESG sectors.

EXPERIENCE

Kapok.ai April 2022 - September 2023
Co-founder, Chief Technology & Architect Officer *Zurich, Switzerland*

· Developed crop yield forecasting product with $> 90\%$ accuracy, with satellite images as inputs
· Developed environmental monitoring of deforestation and prototypes of biodiversity monitoring
· Strategy and product development, customer acquisition and financial and resource planning
· Presentation and negotiation for funding with Innosuisse projects and VC
· Product and prototype development with Python, Pytorch, AWS and Dash

ETH Zurich October 2017 - September 2022
Research Assistant *Zurich, Switzerland*

· Teaching Assistant Image Processing, Machine Learning and Multivariate Statistics
· Developed tool for mapping of more than 2 billion palm oil trees in south-east Asia with open access data.
· Supervisor of several thesis and coordination of programming workflows. Relevant topics: Uncertainty estimation, deforestation detection and crop cocoa mapping
· Co-organizer of several academic and social events in Machine Learning and social media coordinator

Pontificia Universidad Javeriana March 2014 - July 2016
Research Assistant *Bogota, Colombia*

· Joint Research Project with University of Washington, WA and Northeastern University, MA
· Data processing and statistical analysis

Jose A Impresores (Lithography) February 2013 - February 2014
Project Leader *Bogota, Colombia*

· Project Management on Process Engineering, Data workflows with R and SQL for KPIs

EDUCATION

ETH Zurich October 2017 - September 2022
PhD Photogrammetry and Remote Sensing *Zurich, Switzerland*

· Thesis: "Efficient machine learning for large scale remote sensing and natural world datasets"
· Main focus: Intersection of Deep Learning / Machine Learning, Computer Vision and Remote Sensing for open issues in Ecology and Agriculture.

ETH Zurich August 2017
Msc Statistics *Zurich, Switzerland*

· Thesis: "Unsupervised Learning: Generative Models for Cosmology"
· Main focus in Machine Learning and probabilistic and generative models
· COLFUTURO scholarship for graduate studies funded by the Colombian Government

Pontificia Universidad Javeriana December 2012
B.S. Industrial Engineering *Bogota, Colombia*

· Thesis: "Optimizing the use of the muscles in industrial jobs by rotation schemes"
· Main focus in the intersection of mathematical modeling in industrial environments
· Graduated with the best GPA of the program in my cohort
· Outstanding High school Bachelor Scholarship

TECHNICAL STRENGTHS

Advanced Knowledge	Python, Pytorch, Tensorflow, GDAL, QGIS, R, SAS, STATA, GIT
Intermediate Knowledge	Java, SQL, C++, AWS, GCloud

LANGUAGE SKILLS

English	C2
German	C2 (Goethe C2 Level Certificate)
Spanish	Native Language

SELECTED PUBLICATIONS

Google-Scholar

[1] Rodríguez, A. C., D'Aronco, Schindler, K., and Wegner, J. D. Fine-grained species recognition with privileged pooling: Better sample efficiency through supervised attention. *IEEE Transactions on Pattern Analysis & Machine Intelligence*, 01 (sep 2023), 1–16.

[2] Rodríguez, A. C., D'Aronco, S., Daudt, R. C., Wegner, J. D., and Schindler, K. Zero-shot bird species recognition by learning from field guides. *Accepted to IEEE/CVF Winter Conference on Applications of Computer Vision (WACV) 2024* (2024).

[3] Rodríguez, A. C., D'Aronco, S., Schindler, K., and Wegner, J. D. Mapping oil palm density at country scale: An active learning approach. *Remote Sensing of Environment 261* (2021), 112479.

[4] Rodríguez, A. C., Daudt, R. C., D'Aronco, S., Schindler, K., and Wegner, J. D. Robust damage estimation of typhoon goni on coconut crops with sentinel-2 imagery. *Remote Sensing 13*, 21 (2021), 4302.

[5] Rodríguez, A. C., Kacprzak, T., Lucchi, A., Amara, A., Sgier, R., Fluri, J., Hofmann, T., and Réfrégier, A. Fast cosmic web simulations with generative adversarial networks. *Computational Astrophysics and Cosmology 5*, 1 (Nov 2018), 4.

OTHER SKILLS

Rowing, continuos participation in national and international competitions

Also passionate about crossfit, meditation and biking