CURRICULUM VITAE

EDUCATION AND QUALIFICATIONS

Master of Science (with Distinction) – Data Science (Computer Vision and Remote Sensing focus)
University of Edinburgh (Scotland, United Kingdom)
Dissertation: "Unravelling Space Deceptions: A Deep Learning Approach to Unmasking Deepfake Satellite Images Using Spatial and Spectral Techniques".

Master in Business Administration – Data Science and Quantitative Finance
University of Oxford (England, United Kingdom)
Dean's List Trinity Term 2010 (top 10%)

Summa Cum Laude Undergraduate Degree
Universidad Católica Argentina (UCA) (Argentina)

ADDITIONAL COURSES AND TRAINING

2024	**Certified Remote (Drone) Pilot** United States Federal Aviation Administration
2022	**Deep Learning for AI and Computer Vision** Massachusetts Institute of Technology (MIT)
2020	**Machine Learning (Artificial Intelligence MicroMasters)** Columbia University (USA) (through EdX)
2019	**Artificial Intelligence (Artificial Intelligence MicroMasters)** Columbia University (USA) (through EdX)
2019	**Deep Learning Nanodegree**, Udacity
2018	**AI Programming with Python Nanodegree**, Udacity
2013	**Statistics: Making sense of Data**, University of Toronto (through Coursera.org)
2013	**Data Analysis**, Johns Hopkins Bloomberg School of Public Health (through Coursera.org)

PUBLISHED PAPERS

- Ziulu, Virginia. "Leveraging Imagery Data in Evaluations. Applications of Remote-Sensing and Streetscape Imagery Analysis." IEG Methods and Evaluation Capacity Development Working Paper Series. Independent Evaluation Group. Washington, DC: World Bank (2024).
  Link: https://ieg.worldbankgroup.org/evaluations/leveraging-imagery-data-evaluations

- Naeher, Dominik, Raghavan Narayanan, and Virginia Ziulu. "Cash for Coolers or Sustainable Lighting? Assessing Different Components of a Large-Scale Energy Efficiency Program in Mexico." The Journal of Development Studies (2024): 1-15.
  Link: https://www.tandfonline.com/doi/abs/10.1080/00220388.2024.2312827

- Ziulu, Virginia, Jessica Meckler, Gonzalo Hernández Licona, and Jozef Vaessen. "Poverty Mapping: Innovative Approaches to Creating Poverty Maps with New Data Sources." IEG Methods and Evaluation Capacity Development Working Paper Series. Independent Evaluation Group. Washington, DC: World Bank (2022).
  Link: https://ieg.worldbankgroup.org/evaluations/poverty-mapping-innovative-approaches-creating-poverty-maps-new-data-sources

- Naeher, Dominik, Raghavan Narayanan, and Virginia Ziulu. "Impacts of energy efficiency projects in developing countries: Evidence from a spatial difference-in-differences analysis in Malawi." Energy for Sustainable Development 73 (2023): 365-375 (Working paper version: World Bank Policy Research Working Paper 9842).
  Link:
  https://www.sciencedirect.com/science/article/pii/S0973082623000522?casa_token=HGSW1ZDQ39AAAAAA:5noC0aKpt8n_qkTCkeaLUKhxy55qK91jeQJy0GKTL7aXnh8yWv6ur67XkglsMGdKxYl4a0xGNQA

- Naeher, Dominik, Raghavan Narayanan, and Virginia Ziulu. "The relevance of development policies to confront crisis situations: World Bank's early response to Covid-19". Journal of Policy Modeling (2024). (Working paper version: World Bank Policy Research Working Paper 9935).
  Link: https://www.sciencedirect.com/science/article/pii/S0161893824000486

- Chase, Claire, Virginia Ziulu, Priya Lall, Phyrum Kov, Susanna Smets, Virak Chan, and Yeng Lun. "Addressing the behavioural constraints to latrine uptake: effectiveness of a behaviour-change campaign in rural Cambodia." Waterlines (2015): 365-378.
  Link: https://www.jstor.org/stable/24688204

BOOK CHAPTERS

- Ziulu, Virginia, Harsh Anuj, Ariya Hagh, Estelle Raimondo, Jos Vaessen. "Extracting Meaning from Textual Data for Evaluation – Lessons from Recent Practice at the Independent Evaluation Group of the World Bank" (Chapter 5 of book "Artificial Intelligence and Evaluation. Emerging Technologies and their Implications for Evaluation").

- Anuj, Harsh, Virginia Ziulu, Ariya Hagh, Estelle Raimondo, and Jos Vaessen. "World Bank IEG evaluations and the role of data science: reflections from recent experiences" (Chapter 11 of book "Big Data and the Rule of Law"). Manuscript delivered to publishers (Edward Elgar Publishing).

DRAFT PAPERS

- Ziulu, Virginia, and James Garforth. "Advancing Deepfake Detection in RGB Satellite Imagery Through Domain-Specific Ensembles ". To be submitted to remote sensing conference in 2025.

- Naeher, Dominik and Virginia Ziulu. "Zero Tillage and Crop Residue Burning: Evidence from Satellite Remote Sensing and Household Survey Data".

SELECTED PRESENTATIONS AT CONFERENCES

- "Harnessing Image Data for Efficient Evaluation", National Evaluation Capacities (NEC) Conference 2024, Beijing (China), 14 October 2024.
- "Leveraging Text Data and Generative AI in Complex Thematic Evaluations", 10th Annual Measuring Development Conference: AI, the Next Generation, Center for Effective Global Action (CEGA) and University of Chicago, Washington DC (United States), 2 May 2024.
- "From Pixels to Geospatial Insights: IEG's Experience Leveraging Image Data in Evaluations", Geospatial Symposium: Unlocking the Potential of Geospatial Analysis for Evaluations, World Bank, Washington DC (United States), 11 April 2024.
- "Exploring the Potential of Data Science for Evaluations", African Development Bank, Virtual, 30 January 2024.
- "From Pixels to Geospatial Insights", European Evaluation Society (EES), Virtual, 16 November 2023.
- "Deep Learning Applications for Geospatial Analysis", World Bank, Washington DC (United States), 21 September 2023.
- "Exploring the Potential of Generative Models for Evaluative Tasks at the World Bank", Applied Physics Laboratory (APL), Johns Hopkins University, Laurel MD (United States), 5 October 2023.
- "Data Science in Evaluations", Global Evaluation Initiative (GEI), Virtual, 8 March 2023.
- "Geospatial 2.0? Advances in the Use of Imagery Data for Evaluation", Asian Evaluation Week, Virtual, 15 September 2022.
- "Opportunities for Innovation in M&E: Data Science" (delivered in Spanish), gLOCAL 2022, Virtual, 30 May 2022.
- "Use of Image Data to Assess Urban Growth and Informality", European Evaluation Society (EES), Copenhagen (Denmark), 10 June 2022.
- "Leveraging Image Data Analysis for Evaluations", World Bank, Washington DC (United States), 26 January 2022.
- "Using Nighttime Lights Data to Evaluate the Impact of Energy Efficient Projects in Developing Countries", World Bank, Washington DC (United States), 6 October 2021.

ADDITIONAL RESEARCH ACTIVITIES

Ad-hoc reviewer for the Unites States' National Science Foundation (NSF) on deep learning and geospatial analysis grant proposals. Since February 2023.

RELEVANT WORK EXPERIENCE

11/2020 – Current
World Bank Group, Independent Evaluation Group, Washington DC, USA
Data Scientist

- Lead research and implementation of computer vision and remote sensing techniques for geospatial analysis (since 2024).
- Designed and implemented multiple geospatial analyses which included the use of remote sensing data (daytime and nighttime satellite imagery and drone imagery), gridded geospatial databases, and digital streetview images. Techniques used included supervised and unsupervised classification, semantic segmentation, convolutional neural networks, and super-resolution.
- Developed supervised and unsupervised natural language processing (NLP) models to analyze World Bank projects' documents. This work included the generation of keywords to refine portfolio review

protocol, the use of similarity metrics to refine the creation of a training set, and the automatic classification of 1000+ documents.

- Contributed written outputs in the form of journal articles, book chapters, working papers, and blog posts on applications of multiple data science techniques.
- Convened and organised international geospatial symposium "Unlocking the Potential of Geospatial Analysis for Evaluations" (World Bank, 2024) which brought together remote sensing and computer vision experts.
- Presented at multiple international conferences on the application of data science and computer vision techniques for the evaluation of international development interventions.
- Developed and delivered training curriculum for IEG staff on geospatial analysis, principles of remote sensing, and computer vision.

09/2016 – 11/2020
World Bank Group, International Finance Corporation (IFC), Washington DC, USA
Associate Operations Officer

- Led the digitalisation of the GTFP (Global Trade Financing Program) platform (US$5 billion trade finance program). This work included the use of natural language processing (NLP) for the classification of trade documentation.
- Developed interactive and automated database to maintain and track the utilization of limits for over US$8.5 billion assigned to 600+ banks across multiple global products.
- Automated the generation of monthly reports, which substantially reduced the lead time in the preparation of these reports while also reducing the operational risk.
- Led the compilation, harmonisation, and analysis of project data from multiple databases to monitor risk and exposure in specific countries. This work included the application of multiple machine learning algorithms.
- Prepared a network analysis using Python (NetworkX library) based on an internal World Bank dataset of international trade transactions for the period 2005-2020 containing over 60,000 transactions between 500 banks worldwide. The purpose of the analysis was to estimate different parameters of network connectedness at different points of time to evaluate the success of a trade finance World Bank programme in developing countries. The network analysis was complemented with a Tableau interactive visualization showing the different trade flows.
- Designed strategy for Trade unit on medium/long term alternatives to improve data architecture and process automation, as well as to enhance the use of machine learning to analyse transactional data.

08/2015 – 09/2016
World Bank Group, Development Finance, Washington DC, USA
Operations Analyst

- Built statistical models to understand the different parameters influencing trust funds' cost recovery, which led to the design of a new Cost Recovery Directive.
- Developed simulation models and conducted scenario analyses to estimate the impact of Cost Recovery Directive on trust funds.
- Was responsible for the geospatial analysis (using satellite imagery) for the Malawi Drought 2015-2016 Post Disaster Needs Assessment.

08/2013 – 05/2015
World Bank Group, Water and Sanitation Program (WSP), Washington DC, USA
Data Science Consultant (Full time)

- Conducted data analysis and co-developed a method to model access rates to water and sanitation for the bottom 40% of the population using survey microdata.
- Designed methodology aimed at monitoring water balance using Earth Observation data (evapotranspiration, water run-off, and precipitation).

- Led data analysis team (5 consultants) to prepare forecasts on rates of access to rural sanitation for 13 countries and conducted analysis to determine shift needed in current access rates to reach universal access by 2030.
- Created automated visualisations to monitor WSP's portfolio.

08/2010 – 08/2013
World Bank Group, World Bank Institute, Washington DC, USA
Data Analysis and Visualisation Consultant

- Supported multiple teams in conceptualising and creating interactive data visualisations (including maps, charts, and graphs) combining multiple types of data (numerical data, text, geographical elements, etc.)
- Constructed and maintained relational database in MS Access.
- Developed the "Ready to Scale" tab, included in the programme's external website, containing articles and data visualisations I created.

LANGUAGES

Spanish (Native), English (Bilingual Proficiency), French (Advanced), German (Basic).

PROGRAMMING AND SOFTWARE SKILLS

Proficient in Python, R, Google Earth Engine, QGIS, ArcGIS, LaTeX. Familiar with Java and Java Script.