

# EMILIO LUZ-RICCA

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## EDUCATION

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**University of Cambridge**, Cambridge, UK

*September 2027*

MRes: Environmental Data Science (Department of Earth Sciences)

PhD: Artificial Intelligence for the Study of Environmental Risks (Department TBD)

Full funding from the Cambridge Centre for Carbon Credits (4C)

**William & Mary**, Williamsburg, Virginia, USA

*May 2023*

Bachelor of Science: Major in Data Science, Minor in Mathematics

Overall GPA: 4.0

Honors and Awards:

- Graduated Phi Beta Kappa and Summa Cum Laude
- Recipient of the 2023 Outstanding Undergraduate Student in Data Science award
- James Monroe Scholar: program for academically distinguished undergraduates
- Hackathons prizes (coding competitions): 3<sup>rd</sup> place overall at RamHacks 2020, VTHacks 2021, RamHacks 2021 and sponsor prizes at HoyaHacks 2021, Oxford Hack 2022
- William & Mary Allan B. Miller Entrepreneurship Center, Rocket Pitch Fall 2021 Competition: 1st place overall

**University of Oxford**, Oxford, UK

*June 2022*

Visiting student in Computer Science at Hertford College for two terms

**Washington-Liberty High School**, Arlington, Virginia, USA

*June 2019*

Honors and Awards: Valedictorian, National AP Scholar

## PUBLICATIONS

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1. Heinbaugh C\*, **Luz-Ricca E\***, Shao H. Data-Free One-Shot Federated Learning Under Very High Statistical Heterogeneity. In *Proceedings of the Eleventh International Conference on Learning Representations (ICLR 2023)*. 2023 May 1-5.
2. **Luz-Ricca E**, Landolt K, Pickens B, Koneff M. Automating Sandhill Crane Counts From Nocturnal Thermal Aerial Imagery Using Deep Learning. *Remote Sensing in Ecology and Conservation*. 2022 Oct 18.
3. DeSalvo GA, Hoy GR, Kogan IM, Li JZ, Palmer ET, **Luz-Ricca E**, de Gialluly PS, Wustholz KL. Blinking-Based Multiplexing: A New Approach for Differentiating Spectrally Overlapped Emitters. *The Journal of Physical Chemistry Letters*. 2022 Jun 2.

\* indicates co-first authors with equal contribution

## SKILLS

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**Programming**: Python, R, Java, SQLite, Stata

**Data Science**: Computer Vision, Data Visualization, Deep Learning (PyTorch & Tensorflow), Regression Analysis

**Language**: Fluent in Spanish

## RELEVANT EXPERIENCE

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**Research with Professor Huajie Shao**, Williamsburg, Virginia

*October 2021 – May 2023*

- Harnessed the emerging paradigm of federated learning (FL) for effective distributed learning across independent devices while maintaining user privacy

- Focused on the single communication round setting and addressed challenges induced by high statistical heterogeneity across users by proposing two novel methods based on conditional variational autoencoders

**W&M Google Developer Student Club Co-Founder**, Williamsburg, Virginia *July 2020 – May 2023*

- Led a team of student educators to produce 11 interactive workshops on topics including natural language processing (NLP), computer vision, agent-based modeling, scientific computing, and data visualization
- Led a consulting project for the Institute for Integrative Conservation to improve feasibility of automated survey of sandhill cranes by applying methods to additional imagery and aiding data collection efforts in Nebraska

**Research with the Institute for Integrative Conservation**, Williamsburg, Virginia *January 2021 – May 2023*

- Worked with partners in U.S. Department of the Interior agencies to leverage deep learning-based object counting methods and thermal imagery to efficiently count migratory birds in aerial images of the Platte River of Nebraska

**Research with Wustholz Group**, Williamsburg, Virginia *September 2021 – January 2022*

- Used novel experimental single molecule spectroscopy data and one-dimensional convolutional neural networks (CNNs) to automate the identification process to classify several chemical classes from blinking traces

**Commonwealth Cyber Initiative Research Fellow**, Williamsburg, Virginia *August 2020 – May 2021*

- Trained an ensemble of off-the-shelf CNNs to accurately determine road quality from satellite imagery and explored the effectiveness of augmentation-based defenses for disrupting data poisoning attacks

**Research with W&M STAIR Lab**, Williamsburg, Virginia *September 2020 – November 2020*

- Used lexicon-based NLP methods to analyze the securitization efforts of conservative political leaders and news hosts as directed towards the migrant caravan in the fall of 2018

**Monroe First-Year Research Project**, Arlington, Virginia *June 2020 – July 2020*

- Applied NLP techniques to Twitter data to explore news media coverage during the coronavirus pandemic

**ORAL PRESENTATIONS**

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- “Counting Critters: Towards a Practical Implementation of Deep Learning for the Monitoring of Sandhill Cranes,” invited presentation at the Society for Conservation GIS annual international conference (July 2021, virtual)

**RELEVANT COURSEWORK**

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- University of Cambridge: Conservation Science, Environmental Risk, Machine Learning and the Physical World
- William & Mary: Abstract Algebra, Agent-Based Modeling, Databases, Data Structures, Data Visualization, Econometrics, Environmental and Natural Resource Economics, Ethics and Data Science, Game Theory, Mathematical Statistics, Neural Networks & Deep Learning, Probability
- University of Oxford: Artificial Intelligence, Computational Game Theory, Graph Machine Learning, Machine Learning
- Northern Virginia Community College (dual-enrolled): Intro to Multivariable Calculus, Linear Algebra