Davide Crupi

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ABSTRACT

Recently graduated Marine Biologist specialized in machine learning and advanced geospatial analyses applied to ecological research. For my Master's thesis, I applied predictive modeling techniques (Random Forest) to Antarctic ecosystems, converting scattered historical data into detailed species distribution maps validated against field observations, providing clearer insights on predator-prey dynamics.

Led the development and scaling of a citizen science initiative focused on marine organism strandings, enabling rapid data collection across a wide geographic range. Despite limited resources, the project culminated in a peer-reviewed publication and demonstrated the value of community-driven ecological monitoring.

Independently developed automated pipelines using computer vision (OpenCV, Deep Learning) that drastically reduced ecological data extraction times from several days to just a few hours, ready for application in real-world conservation projects.

EDUCATION

University of Genoa, Italy
MSc in Marine Biology and Ecology December 2024

- **Thesis:** *"Predicting Krill and Predator Dynamics in the Ross Sea through Machine Learning."*
  - Presented findings as a speaker at national conferences (APECS Italy 2023, 2024).
  - Applied unsupervised machine learning to model predator-prey dynamics using species distribution data.
  - Integrated environmental and biological datasets via QGIS for spatial analysis and prediction.
  - Gained practical experience in ecological modeling, data wrangling, and interdisciplinary scientific communication.
- Link to Thesis

PUBLICATIONS

Guzzi, A., Schiaparelli, S., Merulla, N., Crupi, D., & Grillo, M. (2024). "Stranding of *Porpita porpita* (Cnidaria, Hydrozoa) on the Ligurian Coast: Sampling Bias or Evidence of a Warming Sea?" *Marine and Fishery Sciences*, 37(1), 103–111.

EXPERIENCE

Stranding Citizen Science Project
Founding Team Member 2024 – Present

- Collected over 300 validated stranding observations within a few months, enabling one peer-reviewed publication and contributing to a continuously expanding dataset powered by an ongoing citizen science initiative.
- Developed digital tools for precise metadata collection (geolocation, photographic validation, species identification).

APECS Italy (Association of Polar Early Career Scientists)
Board Member March 2024 – Present

- Actively participating in organizational activities and digital strategy planning to streamline networking and event coordination among early-career researchers.

INDEPENDENT RESEARCH PROJECTS

Marine Organism Detection Pipeline 2024 – Present

- Developed a semi-automated pipeline using OpenCV and Deep Learning (ResNet18) that segments and classifies marine organisms from underwater video footage with over 90% accuracy, reducing annotation and processing time from several days to a few hours.

Ecological Data Extraction Tool 2024 – Present

- Created user-friendly software that automates data extraction from ecological data repositories (e.g., Bio-Oracle), significantly streamlining dataset compilation for predictive modeling and ecological analysis tasks.

Additional details and project demonstrations are available on: linkedin.com/in/davide-crupi-47766a209/

SKILLS & INTERESTS

Technical Skills:

- **Data Analysis & Machine Learning:** Python (TensorFlow, scikit-learn), R (statistical modeling)
- **Geospatial Analysis:** QGIS, ecological mapping, remote sensing
- **Computer Vision:** OpenCV, object detection & segmentation
- **Programming Tools:** Git, Conda, APIs, Linux command-line

Field & Laboratory Skills:

- Marine species identification and sampling techniques
- Microscopy and histological preparations

Languages:

- Italian (Native)
- English (Cambridge B2 Certification)

Interests: Marine Ecology, Data-driven Conservation, Citizen Science