



# INSTITUTE OF NATURE CONSERVATION POLISH ACADEMY OF SCIENCES

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Mickiewicza 33, 31-120 Kraków  
tel. (12) 370-35-00, fax: (12) 632-24-32

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## Post-doctoral position on computer vision applied to biodiversity monitoring (Biodiversa+ project WildINTEL)

### PROJECT DESCRIPTION

We invite applications for a **postdoctoral position** within the project **WildINTEL** “*Building a scalable WILDLife monitoring system by integrating remote camera sampling and artificial INTELLIGENCE with Essential Biodiversity Variables*” (2023/05/Y/NZ8/00104). This 3-year project is a collaboration of European research teams from Poland, Spain, Norway and Germany, funded under the [BiodivMon call](#) launched by **BiodivERsA+**. The Institutions involved are the Institute of Nature Conservation Polish Academy of Sciences (project coordinator); the Centre for Advanced Studies in Physics, Mathematics and Computation, Faculty of Experimental Sciences, University of Huelva; the Department of Natural Resources and Environmental Health, University of South-Eastern Norway; the German Centre for Integrative Biodiversity Research (iDiv) Halle-Jena-Leipzig, Martin Luther University Halle-Wittenberg; GBIF Spain, Coordination Unit, Spanish National Research Council (CSIC); and, the Electrical Engineering and Computer Science (EECS)/ Computer Science and AI Laboratory (CSAIL) from the Massachusetts Institute of Technology (USA).

The main goal of the project is to develop a cutting-edge coordinated wildlife monitoring system underpinned by the Essential Biodiversity Variables (EBVs) framework. We will combine camera trapping, citizen science, artificial intelligence, and hierarchical models for the automated production of species population and community structure EBVs. This will enable stakeholders to obtain reliable and timely automated assessments of species conservation status and conservation actions to halt biodiversity loss. WildINTEL will collect remote camera images in pilot study areas representing four main European biogeographical regions: Mediterranean, Continental, Alpine and Boreal, namely in Tatra National Park (Poland), Doñana National Park (Spain), Hardangervidda area (Norway) and the Oder river valley (Germany). The project includes the development of artificial intelligence systems for species identification and counting of individuals in camera-trap images from these areas, as well as the maintenance, periodic evaluation and improvement of these systems. At later

stages, the WildINTEL system will help mobilise and optimise the use of existing data and integrate camera-trap projects from other areas while supporting the analysis of the drivers of global change and biodiversity loss at spatiotemporal scales. We will focus on mammals as they are condition sentinels and crucial indicators of ecosystem trophic integrity and global change.

**KEYWORDS:** deep learning, artificial intelligence, computer vision, convolutional neural networks, object detection, image processing, TensorFlow, PyTorch, camera trapping, citizen science.

### **SCOPE OF WORK**

The postdoc will focus on developing artificial intelligence systems for species identification and counting of individuals in camera-trap images for each biogeographical region. She/he will contribute to the maintenance, periodic evaluation and improvement of the systems, as well as to the creation, storage, quality control and management of large databases. The successful candidate will closely work with an interdisciplinary team of mathematicians, computer engineers and ecologists. She/he will support the infrastructure development for the semi-automated monitoring system.

### **CANDIDATE PROFILE**

We seek an expert in computational ecology, computer vision, artificial intelligence techniques and data science. The candidate should have demonstrated skills in computer vision, deep learning, and data science. Experience with Python, TensorFlow, and PyTorch is highly desirable. Proficiency in YOLO and experience with R would be valuable assets, as well as prior involvement in environmental and biodiversity monitoring projects

The successful candidate will conduct research in the broad and exciting area of artificial intelligence, biodiversity science and global change. We seek a highly motivated and creative person, with good communication skills, a strong capacity for work, and the ability to think independently. She/he will be part of an international and interdisciplinary research team, bringing together computer scientists and ecologists. She/he will work closely with collaborators across several institutions. Therefore, a cooperative character, a good command of English (oral and written) and a willingness to travel and conduct research stays abroad are highly desirable. The successful candidate is expected to publish results in scientific journals and disseminate them to scientific and non-scientific audiences. He/she will contribute to achieve the milestones and deliverables of the WildINTEL project. Professional experience abroad is an asset. All qualified applicants will receive consideration regardless of race, color, religion, sex, sexual orientation or identity, national origin or disability status.

## **WORKING ENVIRONMENT**

The [Institute of Nature Conservation in Krakow](#), Polish Academy of Sciences (IOP PAN), is the leading research centre on applied ecology, nature conservation and biodiversity monitoring in Poland. IOP PAN offers a stimulating research environment with unique opportunities to develop your career and academic skills. The candidate will join a multinational research team, whose mission is to investigate the impact of global environmental change on species, ecosystems and ecological interactions. The successful candidate will work closely with an international and interdisciplinary team of researchers and will have to conduct researches abroad. The institute provides excellent working conditions and great support for the development of young researchers, including specific funds for outstanding ideas, as well as for fostering scientific collaboration and professional networking. It is a very dynamic institute with a friendly working environment in the vibrant and beautiful city of Kraków. The city has a high quality of life, with many film, music, and cultural festivals and excellent public transport infrastructure. It is quite safe, most people speak English, and it hosts many university students, also from abroad.

## **CONDITIONS OF EMPLOYMENT**

- Contract: PLN 140,000/year total costs (approx. PLN 11,700/month total costs), based on experience.

This amount is the maximum possible contractual amount for a post-doc in projects funded by the National Science Centre in Poland and includes the employer's costs, full health insurance according to the national system, social security and pension contributions (total costs = gross gross salary). After deductions according to Polish law, the net salary is approximately PLN 7000 net (depending on factors such as documented length of employment, payment of voluntary contributions, ownership of own business, etc.). Presently, such a salary is higher than the salary of 70% of people working in Poland (the cost of living in Poland is lower than in Western Europe).

WildINTEL will cover travel and accommodation costs during project meetings, research stays at project partners and scientific conferences. There are financial bonuses to the salary in IOP PAN, such as publication rewards, as well as IOP PAN internal grants. There is also the possibility to apply for future own research projects at several funding agencies in Poland.

- Period: 30 months (max)

The duration of the contract will depend on the starting date and the project extensions. The maximum duration will be 30 months and the minimum 25 months.

- Location: Kraków, with research stays at the University of Huelva (Spain) and other partner institutions and flexible working schedule (e.g., remote work, task-based approach).

## CANDIDATE REQUIREMENTS

Obligatory qualifications are:

- PhD in computational ecology, bioinformatics, quantitative biology, computer science, statistics, computer technology, computer engineering, mathematics, or other closely-related disciplines.
- Knowledge of Artificial Intelligence, Computer Vision, Deep Learning, and Data Science.
- Experience with Python, TensorFlow, PyTorch and R.
- Good command of oral and written English.
- The applicant must comply with the requirements of the competition rules of the National Science Centre in Poland, in particular, the PhD degree must be obtained in the year of employment in the project or within a period of 7 years before 1 January 2024. This period must be extended in certain cases; please check [the NCN rules here](#).

Additional assets are:

- Documented previous research experience (publications, participation in scientific conferences or research projects).
- Documented professional experience.
- Knowledge of statistical methods and analysis in ecology.
- Knowledge of environmental and biodiversity monitoring.
- Experience in scientific writing and dissemination.
- Experience in the supervision of students.
- Previous working experience in foreign institutions.

## APPLICATION FOR THE POSTDOC POSITION

The required documents are:

- (1) A copy of the PhD degree. The PhD degree must be recognised as equivalent to Polish title or, alternatively, must have passed the nostrification procedures to obtain such recognition by the time of application. The [system KWALIFIKATOR](#) is a tool to assess the level and status of qualifications in the country of issue and to know which foreign degrees are recognised in Poland.
- (2) A letter of interest (maximum 2 pages) detailing the candidate's qualifications for the position, her/his research and professional experience, and how this position will help fulfil personal career goals. The letter should include the candidate's contact information, as well as the contact information of two academic referees or people with whom the candidates have worked.
- (3) Curriculum vitae, including education, employment and research experience with a list of publications and a short description of scientific achievements, particularly information on participation in scientific conferences, workshops, training and internships, participation in research projects, involvement in learned societies and scientific associations, and awarded distinctions and scholarships.
- (4) Declaration of consent for processing of personal data for the purpose of recruitment (see below).

Applications that are not complete or do not include an equivalent or nostrified PhD title will not be considered. The recruitment rules will follow the National Science Centre regulations. The selection will be based on the qualifications of the candidates, including demonstrated skills and competences, scientific achievements, professional experience, awards and internships. Recruitment is a two-stage process and includes: 1) an evaluation of the candidates' documentation and 2) an interview with selected candidates. The Evaluation Committee will be appointed by the Director of IOP PAN.

The four documents should be combined **into a single PDF** and sent by email to the address [sekretariat@iop.krakow.pl](mailto:sekretariat@iop.krakow.pl) with the subject "WildINTEL- postdoc application". The review of applicants **will begin on 30<sup>th</sup> October 2024**, but positions will remain open throughout 2024 until a suitable candidate is found. The decision of the Evaluation Committee will be announced on the IOP website upon the selection of a candidate, no later than the end of the year. This announcement will mark the official closure of the call.

**Declaration of consent for processing of personal data within the framework of the competition procedure for granting scientific scholarships in research projects funded by the National Science Centre**

I consent for my personal data to be processed by the Institute of Nature Conservation Polish Academy of Sciences for the purposes necessary for the recruitment process on the award of scientific scholarships in research projects funded by the National Science Centre (in accordance with the Regulation of the European Parliament and of the Council (EU) 2016/679 of 27 April 2016, on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Regulation on Data Protection ) (J.L. EU. 2016, No. 119, p. 1) - hereinafter referred to as RODO, and national data protection regulations issued on its basis.

Place, date

Signature

I consent for my personal data to be processed by the Institute of Nature Conservation Polish Academy of Sciences in Kraków for the purposes necessary for the recruitment process on the award of scientific scholarships in research projects funded by the National Science Centre (required if the data provided include special categories of data referred to in Article 9(1) of the RODO).

Place, date

Signature