

Position Offered: PREDOCTORAL RESEARCHER

Project: *Quantitative Analysis of Advanced Optical Microscopy Images*

Technological and scientific fields: Image Analysis and Computer Vision, Artificial Intelligence.

Location: Madrid, Natl. Center of Biotechnology, <http://www.cnb.csic.es>

Research Group/PI: Biocomputing Unit, Carlos Óscar Sorzano, <https://biocomputingunit.es/>

PROJECT SUMMARY

The project "Quantitative Analysis of Advanced Optical Microscopy Images" focuses on the development and improvement of advanced techniques for the analysis of fluorescence microscopy images, utilizing the latest innovations in artificial intelligence and computer vision. This project offers an exceptional opportunity for young researchers who wish to engage in cutting-edge technology and science. The main objective of the project is to enhance the accuracy and efficiency of analyzing complex biological images, addressing significant challenges such as variability in sample preparation techniques and lighting conditions. To achieve this, the project will focus on two key areas:

Spatio-Temporal Analysis: 1. Develop methods to precisely track the trajectories of multiple fluorescent biomarkers within living cells. This will allow for better interpretation of intracellular movements and locations, facilitating detailed studies on molecular interactions and cellular processes. 2. Refine image processing algorithms to analyze the spatial relationships between multiple markers, beyond simple colocalization. This will provide a deeper understanding of molecular organizations and their impact on cellular function.

Correlative Microscopy: Implement correlative microscopy techniques that integrate data obtained from different modalities of fluorescence microscopy and electron microscopy. This will allow for a more comprehensive interpretation of biological problems. This multidimensional approach will offer a holistic view of biological processes at the molecular and cellular levels.

PROFESSIONAL PROFILE

Minimum requirements:

Master in any domain related to image processing or data analysis.

Merits to be considered:

Ability to develop software in C, C++, Python, or Java. Knowledge of Linux.

WHAT IS OFFERED

The project includes a robust training plan that includes:

- Training stays at international research centers, allowing the candidate to gain experience and knowledge in different contexts and with complementary technologies.
- Regular workshops and seminars on the latest trends and advancements in the field of microscopy and image analysis, facilitating continuous knowledge updating.
- Intensive practical training in the use of programming platforms such as Java and Python, and in handling specialized libraries, ensuring that the candidate develops solid and applicable technical skills.
- The project also encourages participation in renowned scientific conferences and congresses, such as the International Symposium on Biomedical Imaging (ISBI), promoting the dissemination of research results and the establishment of professional networks.

Contract conditions:

Predoctoral Researcher contract of 4 years' duration. Gross annual salary of 23,871.33 €.

Start of contract: before 31 December 2024

PRINCIPAL INVESTIGATOR CONTACT

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