

# Position Offered: POSTDOCTORAL RESEARCHER

Project: *Updating the standard model common to vision and artificial neural networks, with an application to reduce the environmental impact of video streaming*

**Technological and scientific fields:** Artificial Intelligence, Image analysis and computer vision, Massive data and information processing technologies, Green algorithms

**Location:** Madrid, Instituto de Óptica, <https://www.io.csic.es>

**Research Group/PI:** Marcelo Bertalmío, <https://www.io.csic.es/marcelo-bertalmio/>

## PROJECT SUMMARY

Vision science and Artificial Neural Networks (ANNs) share the same standard model abstraction (SMA), where we try to represent arbitrarily complex processes as cascades of linear filters and nonlinearities. The SMA was originated in the mid-20th century as an approximation to how biological neurons in the visual system work, but time has shown that the SMA is an oversimplification that ignores fundamental cell properties. As a result, ANNs behave differently from the brain in many key aspects, and vision models have a modest performance for some basic phenomena both in low and high level vision.

Our main goal is to overcome the limitations imposed by the SMA through an unconventional interdisciplinary approach grounded on the interaction between neuroscience, mathematics, vision science and machine learning.

## PROFESSIONAL PROFILE

### Minimum requirements:

- PhD degree in computer science, neuroscience, mathematics, artificial intelligence, or related field
- Three years minimum of postdoctoral experience
- Proficiency in English

### Merits to be considered:

- Knowledge of vision science, machine learning, neuroscience, and mathematics for deep learning, including mathematical optimization and partial differential equations.
- Experience with programming and tools for deep learning and computer vision.

## WHAT IS OFFERED

Performing cutting edge interdisciplinary research at the intersection of vision and artificial intelligence, with a potentially enormous impact. Work involves collaboration with, and recurrent short stays at, world-leading labs in Europe.

In-person work at CSIC facilities in downtown Madrid, with the possibility of doing remote work up to two days per week.

### Contract conditions:

Indefinite contract for a Postdoctoral Researcher associated to the Momentum Project of 4 years' duration according to Spanish science law. Gross annual salary (41.000 € - 52.000 €).

**Start of contract: before 31 December 2024**

## PRINCIPAL INVESTIGATOR CONTACT

Email: [marcelo.bertalmio@csic.es](mailto:marcelo.bertalmio@csic.es)

Phone: +34 917040774

[momentum@csic.es](https://momentum.csic.es/) | <https://momentum.csic.es/>