ARTIFICIAL INTELLIGENCE, NEURONAL NETWORKS, AND ANALYSIS OF IMAGES AND DATA IN REAL-TIME

Description

We offer our experience in the development of software and advanced calculation techniques such as neural networks and deep learning within the field of artificial intelligence to accelerate and improve the analysis of images and data. Among the applications we are working on, we can highlight image classification, motion detection, region segmentation, data cleaning and selection, and analysis of its main characteristics.

How does it work

Artificial intelligence techniques, and more specifically neural networks, are capable of establishing models that allow transforming input data (images, data tables …) into output results (images, labels …). These models are formed from a series of images and available data and allow their subsequent use on new cases. Our group has experience in a wide variety of these methods, keeping up to date with the latest developments that are being developed. In an initial phase, an analysis of the proposed problem would be carried out (taking into account the available data, objectives, metrics and deadlines). Once the problem has been analyzed, a proof of concept would be developed in which the potential of the proposed solution would be shown. If the results are satisfactory, an advisory or research contract could be established through the OTRI with our group to continue its development, or the software developed could be licensed.

Advantages

The use of incorporating current artificial intelligence tools can open up new business possibilities. Likewise, it allows to improve certain processes by making them much more efficient, and offering new capabilities to existing systems and equipment. Finally, its use arises as a necessity in order not to be left behind in the face of other competitors and in the face of customer demands for this type of new technology.

Where has it been developed

In the Nuclear Physics Group (GFN) of the UCM, we have a long experience in the development of software as well as in the application of neural networks for the analysis of images and data from collaborations with companies and research centers worldwide. Knowledge has been developed within the field of medical imaging research (PET, CT, Ultrasound), radiotherapy (Proton therapy, photoacoustics) and experimental nuclear physics (CERN, Jefferson Lab (USA)). The use of these techniques has managed to improve the performance of many computers, by taking advantage of the acquired data more efficiently.
In 2020 we were outright winners at UNESCO, IBM and SAP's CodeTheCurve Hackathon with an AI application for COVID19 patients.

And also

At the GFN-UCM we also have extensive experience in the development of Monte Carlo radiation-matter interaction simulators that allow us to model a large number of physical processes in nuclear physics and medical physics in a realistic way.

Responsible Researcher

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