

Postdoctoral Fellowship position

Combining network-automata and neural networks for data analysis

Selection of a postdoctoral fellow for the project “Combining network-automata and neural networks for data analysis” to be carried out at the Scientific Computing Group (prof. Odemir Bruno - www.ifsc.usp.br), São Carlos Institute of Physics of the University of São Paulo (IFSC/USP), located in São Carlos-SP, Brazil, and at BIOSPACE (Prof. Jan Baetens, <https://biospace.ugent.be>), Faculty of Bioscience Engineering at Ghent University in Ghent, Belgium. It is mandatory to work in Brazil for at least one year, with the possibility of working up to two years, and it is recommended to work up to one year in Belgium, making the total postdoctoral fellowship duration up to three years.

This scientific proposal project comprises the areas of cellular automata, machine learning, and complex networks and their applications to data analysis and pattern recognition.

The project aims to develop new tools to characterize and extract measures of complex networks using network-automata and neural network tools that embody the characteristics of the phenomena and data under study and reveal underlying behavior. Consequently, it is important to evaluate which are the most informative extractable measures. For that purpose, we will rely on pattern recognition tasks to identify the best descriptors. Specifically, the goals are: (i) to investigate and propose network-automata models to characterize the dynamic evolution of complex networks; (ii) to adapt and propose techniques based on neural network models to learn features from the complex networks and their dynamic evolution generated by network-automata, thus combining the two approaches.

This project is linked to the FAPESP/FWO project “An analysis of network automata as models for biological and natural processes” (proc. 21/08325-2). The selected grantee must have a PhD degree obtained in the last 6 years in the field of Computer Science, Engineering, Mathematics, Physics or in related areas and will receive a postdoctoral grant from FAPESP with a monthly value of R\$ 8.479,20 (working in Brazil) and EU 2.850,00 (working in Belgium) (Cost of travel is granted).

Deadline: 04/15/2023

Requirements:

The candidate must meet the following requirements:

- Experience in the areas of pattern recognition, image analysis, neural networks and complex networks;
- Outstanding academic and scientific performance, with scientific publications (in vehicles of recognized quality – indexed international journals) in the project's themes. At least 1 publication on complex networks or cellular automata, 1 publication on artificial neural networks and/or 1 publication combining both methodologies is required.

Selective process

Interested candidates who meet the requirements should send the necessary documents for application to Prof. Dr. Odemir Bruno (email: bruno@ifsc.usp.br) with the subject “**Postdoctoral Fellow FAPESP/FWO**”:

1. Updated Curriculum Vitae, indicating training, scientific production, projects in which he participated;
2. Cover letter, with the motivation for the research and highlighting your skills related to the project theme.

The submission of documents for the effective registration in the selection process must be carried out by 04/15/2023. The selection process will be based mainly on the academic profile, in particular, on the scientific production related to the topic in vehicles of recognized quality, in addition to the cover letter.