

Title: Fully-funded Postdoc position in “Biological neural-network signal encoding using Artificial Intelligence”

Location: University of Trento, Italy

Duration of the position: One year (it may be renewed for a second year).

Description:

Applications are invited for one full-time postdoctoral research position funded by the Brandy project (<https://projects.unitn.it/brandy/>) and in collaboration with the ERC project Backup (<https://r1.unitn.it/back-up/>). The goal of both projects is to investigate the brain network functioning using an inter-disciplinary approach. We are currently seeking a highly motivated Postdoc with a strong research record in Artificial Intelligence areas such as: Audio Processing, Signal Processing, Speech Recognition, Computer Vision, etc.

The successful candidate will participate in proposing, implementing and applying Deep Learning methods for the analysis and the interpretation of electrophysiological signals of biological neuronal networks. Specifically, we will use a Multi-Electrode Array (MEA) to access the activity of a culture of in-vitro alive neurons. The MEA response is a set of time-varying signals, one signal per electrode, usually characterized by a very low Signal-to-Noise-Ratio (SNR). These raw signals (possibly pre-processed to increase the SNR) will be used to train an artificial neural network in order to predict (“encode”) the biological neuron activity in the near future. Predicting the future activity of the biological neurons will show that the artificial network can “understand” and internally represent the “semantics” of the input MEA signal. We will investigate Deep Learning methods for brain (neuronal network) activity encoding and we will generalize the proposed methodology to different kinds of brain activity signals (e.g., fMRI, MEG, etc.).

The successful candidate will work in the NL lab of the Physics department of the University of Trento, supervised by Dr. Enver Sangineto and in collaboration with both the Artificial Intelligence group of Prof. Nicu Sebe (<http://mhug disi.unitn.it/>) and the Nanoscience Laboratory of Prof. Lorenzo Pavesi (<http://nanolab.physics.unitn.it/>), in a strongly inter-disciplinary group composed of Computer Scientists, Biologists and Physicists.

For more information, please contact Dr. Enver Sangineto (enver.sangineto@unitn.it).

Interested applicants should send:

1. a one-page cover letter summarizing their interests, how they can contribute to the project, as well as the earliest date that they can start the appointment,
2. curriculum vitae, and
3. contact information for two references

to: enver.sangineto@unitn.it. Only applicants considered for employment will be contacted. Applications are reviewed on a rolling basis.