PhD fellow in Information theoretic analysis of neuron-astrocyte interactions.

IIT invites excellent candidates to apply to its PhD program organized in collaboration with the Open University; this international PhD program confers Doctorates in *Health, Sustainable and Human Technologies*.
In order to be admitted into the ARC program, the minimum requirements are

i. a Masters-level degree, which broadly corresponds to a 4/5-year undergraduate MSc/MChem/Meng-style degree or to a postgraduate Masters in the British system, or to a second level University degree in Italy;
ii. a grade corresponding to an upper second class (2.1) or a merit in the UK system or 100/110 in the Italian system. Candidates with lower grades but redeeming features (publications, specific expertise) are requested to contact the potential supervisors before applying;
iii. where English is not the applicant's first language, a valid IELTS (International English Language Testing System) certificate. The minimum acceptable score is an overall 6.5, with no less than 6.0 in any of the four categories

One PhD fellow position **will be available from April 1st 2025** in the Optical Approaches to Brain Function Research Line led by Dr. Tommaso Fellin.

Title of the project: **Information theoretic analysis of neuron-astrocyte interactions.**
Description: Recent empirical work has begun to unravel how astrocytes interact with neurons and how their interactions shape cognitive functions and information processing in the brain. Yet, we still need to develop a mathematical methodology for quantifying, modelling and understanding how neurons and astrocytes interact and how their interactions shape brain information processing and computations. This computational project will develop analysis methods based on information theory and biophysically plausible modelling to understand how the interactions between astrocytes and neurons improve the information carried by populations of neurons in the brain. The project will give ample opportunities to analyze and model empirical data from the mouse brain collected by the principal Supervisor's lab and to build on the computational methods developed by the second supervisor's lab.
External Reference
Main Supervisor: Tommaso Fellin (Optical Approaches to Brain Function)
Other Supervisor: Stefano Panzeri, Professor at UKE Hamburg and external collaborator of IIT
Essential expertise:

i. MSc in a numerate discipline or in neuroscience
ii. Keen interest in neuroscience
iii. Excellent knowledge of written and oral English
iv. Ability to write code

Desirable expertise:

i. Prior exposure to research in computational neuroscience
ii. Ability to work in an interdisciplinary environment
iii. Problem-solving capabilities
iv. High motivation to learn

How to apply. Prospective students must submit using the online form the following documents

1) 2-page CV, which includes studies, expertise and achievements.
2) 1-page research statement, which includes the choice of a project from the list above and a justification of the choice. Only if robustly justified, the student may signal their interest also for a second project, but there is no guarantee that this will be taken into account by the selection panel.
3) A transcript of undergraduate and postgraduate studies.

4) A valid IELTS certificate, obtained no more than two years before the proposed registration date.
5) Contact details of two referees.

Deadline for application: January 25th 2025.

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Please note that the data that you provide will be used exclusively for the purpose of professional profiles' evaluation and selection, and in order to meet the requirements of Istituto Italiano di Tecnologia. Your data will be processed by Istituto Italiano di Tecnologia, based in Genoa, Via Morego 30, acting as Data Controller, in compliance with the rules on protection of personal data, including those related to data security.