EGO robotized seismic array project

Type of contract
Traineeship contract for a period of 5 months in the Interferometer Technology Department, in the Noise&Control Group, funded by the EGO Consortium.

Description
The European Gravitational Observatory (EGO) hosts and manages the Virgo gravitational wave detector. Virgo is a laser interferometer with 3 km arms located in Cascina, near Pisa (Italy). Virgo is part of the worldwide network of interferometers which has detected about 90 gravitational wave signals from coalescence of compact objects in last years.
At EGO, we are developing robotized sensors in the framework of the AHEAD2020 EU project. An array of movable seismic sensors is useful for an optimal cancellation of the Newtonian Noise (NN) component from the Virgo gravitational wave signal. The NN is associated to fluctuations of the gravitational force field around the Virgo mirror test masses, which produces a displacement force acting directly on the mirror bypassing the seismic isolation system.
The robots have to autonomously move and position themselves in assigned locations inside the Virgo experimental buildings, avoiding obstacles and managing floor imperfections. Once in position, each robot deploys one seismic sensor to the floor.
Seismic data are then transferred wirelessly to the Virgo data acquisition system where a supervisor software elaborates the data and computes new positions for the robots. Upon needs, robots move to the recharging station.
The robot mobile strategy is based on the line-following technique. The experimental floor is sectioned in zones delimited by white-and-black stripes. The robot follows these paths to reach the assigned zone, then moves inside the zone by counting wheel turns.
The existing prototype uses an Arduino micro-controller and commercial sensors (encoders, motors, infrared sensors). The hardware is place.

Assignment
We are looking for a motivated student to work in the development and implementation of the code for the line-following technique. The collaborator is asked to work in autonomous way, with the guarantee of the technical support of the EGO team involved in this project.
The chosen candidate will operate in a scientifically stimulating context, and interact with scientists of the Virgo collaboration.

Requirements
The work will be at a level of Master-level student in Physics or Engineering (equivalent to thesis for “laurea specialistica” in Italian).
Applicants should have experience in the robotic field and knowledge of C/C++, Arduino coding, Python, Unix shell scripting.
English required.

EGO – Via E. Amaldi n. 5 - 56021 Santo Stefano a Macerata – Cascina – Pisa – Italy - Telephone ++39.050.752521 - Fax ++39.050.752

Place of work
EGO - European Gravitational Observatory - Via Edoardo Amaldi cap 56021 Loc. Santo Stefano a Macerata - Cascina (Pisa) Italy. Given the lack of public transport to reach EGO, a driving license and a personal vehicle are strongly recommended.

Further information
For the whole duration of the traineeship, EGO will pay a gross monthly wage of 500,00 euro and offer the lunch service at its canteen during working days to the student.

How to apply
Interested candidates are invited to fill in the Internship Application Form and send it, together with the CV, to internships@ego-gw.it

Privacy policy
Controller: European Gravitational Observatory – email: ego-gw@pec.it
Responsible for data - email: privacy@ego-gw.it
Under Article 13 of UE Regulation (EU) 2016/79 of the European Parliament and of the Council, required personal data will be exclusively collected and treated for purposes strictly connected to the selection procedure also with the use of computerized procedures, according to current law and regulations concerning the implementation of this kind of activity.
Providing such data to EGO is necessary for the evaluation of participation requirements and of the holding of titles: failure to provide these data may compromise such evaluation.
Data will be kept only for the period required by the selection, evaluation and audit procedures. EGO guarantees each person the right of access to personal data, as well as the rectification, or erasure or restriction of them, as well as the right to object to their processing; such requests shall be addressed to privacy@ego-gw.it

Closing date for applications
Until position is filled

Contact
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