



Postdoctoral Programme in Deep Machine Learning Techniques for High-Energy Physics

12-month contract, renewable for max. of another 24 months

Your mission

The main objective of this position is to develop algorithms and methods based on deep learning techniques for high-energy physics data processing. The main scope of research is to provide contemporary high-energy physics experiments such as those on NICA and LHC accelerator facilities alternative tracking and PID methods. These methods must be able to cope with increasing luminosity and event rate of the mentioned experiments, to increase the efficiency and the speed of the event data processing.

Your tasks

You will work within our ML/DL group. Your research programme will focus on:

- Conducting a thorough review and study of available publications on the application of ML/DL methods for processing, analysis and fast modeling of experimental data in high-energy physics, paying special attention to the application of graph neural networks with an attention mechanism and transformer neural networks;
- Development of ML/DL algorithms for experimental data processing;
- Implementing the developed algorithms and methods into the experiment's software packages;
- Performance analysis of the developed algorithm in comparison with existing ones on different experimental data.

Constraints and risks

The candidate is expected to undertake international business trips for periods varying from 1 to 4 weeks. Remote work is not allowed.

Depending on your citizenship, you may need to obtain a visa and this process can last several months. JINR offers all the necessary support for obtaining the entry permit for the Russian Federation.

Your profile

- Highly motivated candidate with a PhD (obtained less than 5 years ago) in physics, information technology science or in a similar field.
- Age under 40, have not had more than 3 temporary positions.
- Strong background in experimental physics or information technologies is a prerequisite.
- Practical experience in developing ML/DL algorithms for physics experiments would be advantageous.
- Experience in utilization of GPU/CPU parallelization.
- Programming languages knowledge at high level: C++, Python.
- As an international intergovernmental research organization, we are particularly keen to ensure that we also attract applicants from outside Russia. You must have a good knowledge of English and be willing to learn Russian (a language course will be paid for by JINR).

** Winners of last year's JINR Postdoctoral Programme and JINR Fellowship Programme who were previously employed at JINR are not eligible to participate in the contest again, as current JINR employees.*

Candidates from JINR Member States are considered for employment at the Institute by nomination from JINR Member States Plenipotentiary Representative.

What we offer

High quality of life

Called the "Island of Stability", the city of Dubna is ideally located on the bank of Europe's largest waterway — the Volga River (only 2.5 hours from Moscow by train or bus and 1.5 hours by car from Sheremetyevo International Airport). It is important for us that our employees quickly and easily adapt to the new living conditions and have a healthy work-life balance. Therefore, we offer accommodation in comfortable guest-house rooms (for single employees), or fully furnished flats owned by JINR, and annual paid leave.

Prospects

We guarantee you a **12-months postdoctoral contract, renewable for max. of another 24 months (36 month in total)**, in a multicultural scientific environment.

Remuneration

US\$ 2,300 per month (paid in Russian rubles at the planned exchange rate (forecasted year-average, adopted in the JINR budget for the current year, which is fixed on the date of conclusion of the contract and valid throughout its entire term). In 2026, the exchange rate is RUB 92.2 per US\$ 1. The exchange rate for 2027 is preliminary planned to be RUB 87.4 per US\$ 1).*

Income tax of 13 % is applied. The employer shall pay no pension insurance.

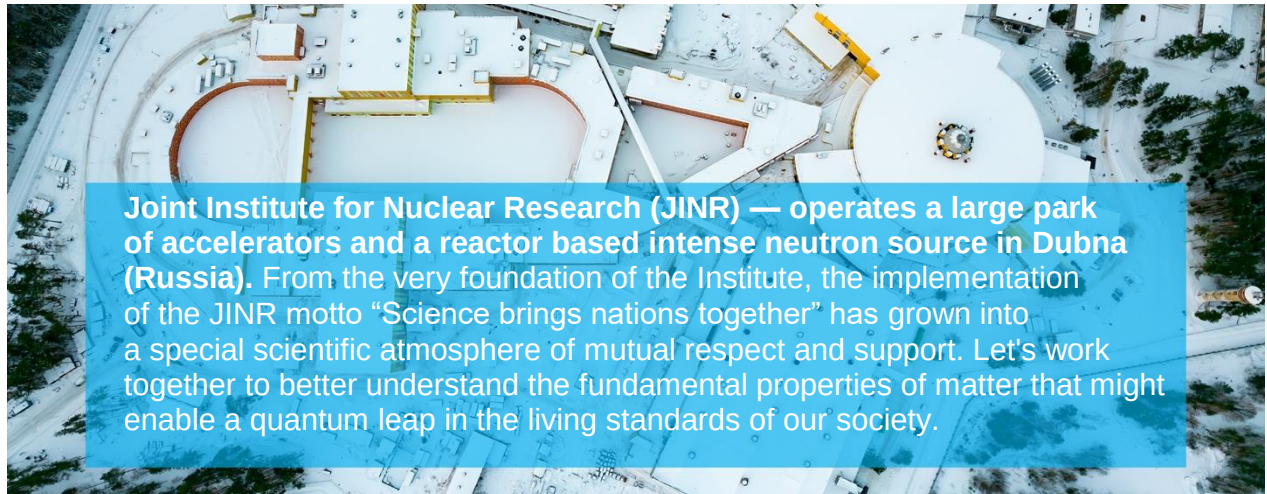
*The average per capita income in the Moscow region is 110 thousand rubles.

Benefits

We offer considerable social benefits: annual paid leave of 42 calendar days with an additional one-time payment of 50 % of your monthly salary after one year of employment, air fare (except for family members) at the beginning and the end of the employment period in case the terms of the contract are fulfilled, accommodation support (50 %, excluding the cost of utilities and furniture

rental), free local health insurance for you and your family members, relocation assistance (transfer from/to airport at the beginning and end of the contract for all family members). We also offer free Russian language courses and subsidies for the use of JINR sports infrastructure for the employee (Olympic swimming pool, stadium, gym, climbing wall, etc.), as well as access to a variety of cultural activities.

Apply now



Joint Institute for Nuclear Research (JINR) — operates a large park of accelerators and a reactor based intense neutron source in Dubna (Russia). From the very foundation of the Institute, the implementation of the JINR motto “Science brings nations together” has grown into a special scientific atmosphere of mutual respect and support. Let's work together to better understand the fundamental properties of matter that might enable a quantum leap in the living standards of our society.

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