

## JOB OFFER

Position in the project:	<b>Sano Postdoc - Project title:</b> Embedding explainability in AI machine learning process
Scientific discipline:	Computational Medicine, Data Science, Computer Science
Job type (employment contract/stipend):	A full-time contract of employment until end of 2023
Number of job offers:	1
Remuneration/stipend amount (“X0 000 PLN of full remuneration cost, i.e. expected net salary at X 000 PLN”):	<ul style="list-style-type: none"> <li>• An attractive basic salary up to 14000 PLN gross</li> <li>• Additional private medical care and partially sponsored access to sport facilities</li> </ul>
Position starts on:	Expected start in November 2022 (but depends on Candidate’s availability)
Maximum period of contract/stipend agreement:	2 years
Institution:	Sano Centre for Computational Personalised Medicine – International Research Foundation, Krakow, Poland
Project leader:	Dr. Jose Sousa (Personal Health Data Science Research Group Leader)
Project title:	<p>Operationally, Sano strategically combines the most prestigious scientific grant currently available from the national Polish Foundation for Science (FNP) – the International Research Agenda Programme (IRAP) – with one of the most competitive grants in the EU’s H2020 programme, Teaming for Excellence.</p> <p>Combined with additional Polish Ministry of Science guarantees, the Centre has secured investment exceeding €30M. With this scale of funding, and aided by an excellent European partnership network, we can be confident that Sano will bring a critical mass to this transformational field of research, in order to translate scientific advancement into clinical practice.</p>
Project description:	<p><b>Sano presents a great opportunity for people who want to make a change in the world by developing life-changing technologies and solutions for healthcare worldwide.</b></p> <p>Sano Centre for Computational Medicine is a new International Scientific Foundation located in Kraków, Poland.</p> <p>Sano aspires to be a major translational scientific institute, operating at the meeting point of academic science, established MedTech industry, and emerging start-up environment, combining the best of these three perspectives.</p> <p>Established with support from the European Commission and the Foundation for Polish Science, Sano aims to be a major driving force behind the advancement of computational medicine for the benefit of healthcare systems worldwide.</p> <p>Sano acts as a core technology and expertise provider for industry, and creator of innovation, developing state-of-the-art solutions for healthcare. Thanks to the substantial funding and excellent European partnership network, Sano will bring a critical mass to this transformational field of research, in order to translate scientific advancements onto clinical practice. Sano’s ambition is to become the Reference Centre for Computational Medicine in Central Europe and build a reputation as a leading institute on a global level.</p>

As a cross-disciplinary institution, Sano uses machine learning/artificial intelligence (ML/AI), large scale computer simulations (HPC), data science, and other computational technologies towards overcoming global challenges in healthcare systems. The research agenda will be executed in close collaboration with Partners in Poland, EU and USA.

**We value:**

- Passion - Passion in what we do, engagement in Sano operations, taking responsibility, providing initiative, being happy at work.
- Innovation - Boldness in articulating and pursuing novel ideas, courage to think outside the box.
- Integrity - Directness, openness, tolerance and respect. Scientific integrity (we do not cut corners).
- Diversity - Diversity in backgrounds, cultures and opinions of Sano employees. Promotion of women in STEM.

Sano's Research Agenda is built on six research pillars, interacting with each other. For each of the pillars, Sano aims to attract senior professionals to assume positions of Group Leaders. Although fully independent, all of the groups at Sano will be working in concert to invent computational healthcare solutions of the future.

Sano is looking to fulfill a role of:

**Postdoc - Project title: Embedding explainability in AI machine learning process**

Machine learning algorithms are becoming, or already are, an essential part of the human decision-making processes. As a result of their increasing impact on human daily lives, the problem of the so-called trustworthy artificial intelligence (AI), becomes fundamental. This is of particular importance when developing AI machine learning process for medical purposes. One of the fundamental elements of trustworthy AI should be its ability to explain the assumptions applicable to the obtained results. The research that is proposed here is a one-year research project where knowledge from theoretical physics, from the field of statistical physics, it will be explored as an avenue to embed explainability in the machine learning process to support a trustworthy AI. It will be integrated in AI the conceptual framework being developed in the Personal Health Data Science Group.

Key responsibilities include:

It's possible that the explainability of an algorithm can be ensured by embedding it with an archetypical model from statistical physics. The form of such a model is strongly dependent on the representation of knowledge and data used in the problem. In the case of knowledge graph representation, such a model should be based on well-known statistical physics network models, such as the ISING model. Such a description should automate the identification of the interdependences between different knowledge elements associated with data features and to analyse them qualitatively and quantitatively. A model constructed in this way will allow not only to prospect pathways, but also to trace the features affecting it. Moreover, thanks to the description of the interdependences, a statistical physics-based model of knowledge graphs may also prospect the further evolution of the system and identify system elements whose change can reverse the disorderly changes of the system. The implementation of this plan is strongly related to the overall project carried out by the research group. Preparations will require proper presentation of data, simplification by

	<p>means of abstraction and determination of dynamic methods for determining the links between them.</p> <p>What are you going to do?</p> <p>You are expected to:</p> <ul style="list-style-type: none"> <li>do original research under the direction of one of Research Group Leaders;</li> <li>publish your work in peer-review journals and present during national and international conferences;</li> <li>co-mentor junior scientists – PhD students and MSc students.</li> </ul>
<p>Profile of candidates/requirements:</p>	<p>As our successful candidate you should have:</p> <ul style="list-style-type: none"> <li>recent or pending PhD in relevant field, preferably computer science or bioinformatics;</li> <li>at least one first-author research publication in a peer-reviewed scientific journal, top conference or currently in press (e.g. Neuroimage, Nature Methods, Nature Communications, Nature Scientific Reports, PloS, IEEE TMI, ...);</li> <li>excellent written and oral English communication skills;</li> <li>excellent programming skills.</li> </ul>
<p>Required documents:</p>	<p>Sano is an equal opportunities employer. We prioritize diversity and are committed to creating an inclusive environment for everyone. We value a spirit of enquiry and perseverance, provide the space to keep asking questions, and promote a culture of curiosity and creativity.</p> <p>Do you recognize yourself in the job profile? Then we look forward to receiving your application.</p> <p>Applications in .pdf should include:</p> <ul style="list-style-type: none"> <li>a cover letter;</li> <li>a curriculum vitae.</li> </ul>
<p>We offer:</p>	<p>We offer a fixed term contract for 40 hours per week for the duration of up to 2 years. This will be supported by an educational plan that includes attendance of courses and (international) meetings. The contract will include opportunities to participate in teaching and supervision of undergraduate and master students.</p> <p>The salary, depending on relevant experience before the beginning of the employment contract, will be up to 14000 PLN gross per month, based on a full-time contract (40 hours a week) for the duration of 2 years with private medical care and a sports card.</p> <p><b>Sano offers excellent opportunities for study and development, an access to many international conferences on computational medicine and a possibility to grow in a scientific society.</b></p>
<p>Please submit the following documents to:</p>	<p>Our recruitment system:</p> <p><a href="https://sano.elevato.net/en/sano-postdoc-project-title-embedding-explainability-in-ai-machine-learning-process,ja,145">https://sano.elevato.net/en/sano-postdoc-project-title-embedding-explainability-in-ai-machine-learning-process,ja,145</a></p>

	We will support you in every stage of the recruitment process.
Application deadline:	October 27 <sup>th</sup> 2022
For more details about the position please visit (website/webpage address):	<a href="http://www.sano.science">www.sano.science</a>
Euraxess job/stipend offer (in case of PhD and postdoc positions):	<a href="https://euraxess.ec.europa.eu/jobs/848348">https://euraxess.ec.europa.eu/jobs/848348</a>

#### Non-Discrimination

To provide open, transparent and internationally accessible career development opportunities the Centre will follow The European Charter for Researchers and The Code of Conduct for the Recruitment of Researchers. The entire recruitment process will be carried out respecting the non-discrimination rules; the Centre is an equal opportunity employer, values diversity and affirms the right of every qualified applicant to receive consideration for employment without regard to race, colour, religion or belief, sex, gender identity or expression, national origin, language, sexual orientation, disability, age, political opinion, social or economic condition.

#### Your Personal Data

In accordance with the general regulation of 27 April 2016 on the protection of personal data, hereinafter referred to as GDPR, we wish to inform you that:

1. The Administrator of your personal data is the Sano Centre for Computational Personalised Medicine - International Research Foundation – located at (30-072) Kraków, ul. Nawojki 11. The Administrator may be contacted at the following e-mail address: [legal@sano.science](mailto:legal@sano.science).
2. Your personal data shall be processed for the purposes of the recruitment process.
3. The legal basis for processing your personal data for the purposes of recruitment shall be Article 6 Section 1 Point c of the GDPR, with processing being necessary for the fulfilment of a legal obligation to which the Administrator is subject, particularly Article 118a of the Law on Higher Education as well as Article 221 of the Labour Code. The condition legalising the processing of personal data provided voluntarily by the candidate, which is beyond the scope of data referred to in Article 221 of the Labour Code, shall be Article 6 Section 1 Point a of the GDPR – consent by the data subject.
4. Providing your personal data, subsequent to the decision to enter the recruitment process, is obligatory within the scope defined by Article 221 of the Labour Code and the Law on Higher Education and determines the possibility of applying for work as well as possible further employment. In the case of personal data which is beyond the scope of the aforementioned legal regulations, providing your data is voluntary but it does determine the possibility of participating in the recruitment process.
5. Your personal data shall be processed on behalf of the data administrator by authorised personnel purely for the recruitment purposes.
6. Your personal data shall be stored for a period of time necessary for the fulfilment of the recruitment process. Should the recruitment outcome prove negative, your data shall be removed immediately at the completion of recruitment, unless otherwise provided by the record-keeping regulations – then for a period of time specified in these regulations.
7. Your personal data shall not be shared with external entities with the exception of cases provided for by legal regulations. Should you submit your application documents in electronic form, the recipient of your data may be an entity acting on behalf of the administrator i.e. a mail service operator.
8. Under the terms of the GDPR, you shall be entitled to:
  - a. the right to access your data,
  - b. the right to rectify it if factually incorrect,
  - c. the right to remove or restrict the processing of the data as well as the right to data portability – in cases prescribed by the law,
  - d. the right to object to the processing of the data,
  - e. the right to file a complaint with the supervisory authority – the President of the Personal Data Protection Office, should you consider that the processing of your personal data violates personal data protection regulations.