JOB OFFER

Position in the project:	**Sano MSc Project - Project title:** Optimization of dose distribution in proton radiotherapy.
Scientific discipline:	Computational Medicine, Machine Learning
Job type (employment contract/stipend):	Stipend – approx. 16 working hours per week (40% FTE)
Number of job offers:	1
Remuneration/stipend amount *("X0 000 PLN of full remuneration cost, i.e. expected net salary at X 000 PLN"):*	• Stipend up to 2500 PLN gross monthly
Position starts on:	Expected start in November 2022
Maximum period of contract/stipend agreement:	End of MSc studies (graduation at the end of 2022/2023 academic year)
Institution:	Sano Centre for Computational Personalised Medicine – International Research Foundation, Krakow, Poland
Project leader:	Sano: Dr. Maciej Malawski (Extreme Scale Data and Computing Research Group Leader) AGH and Institute of Nuclear Physics: Dr. Leszek Grzanka
Project title:	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. 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.
Project description:	**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.** Sano Centre for Computational Medicine is a new International Scientific Foundation located in Kraków, Poland. 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. 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. 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.

	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.
Key responsibilities include:	Sano is looking to fulfill a role of: **Project title:** Optimization of dose distribution in proton radiotherapy. Publication date: 06.10.2022 Closing date: 20.10.2022 Level of education: Undergraduate (BSc, BEng) Hours: approx. 16 working hours per week/40% FTE Salary indication: stipend for up to 2500 PLN gross monthly Supervisors: Dr. Maciej Malawski (Extreme Scale Data and Computing Research Group Leader) Dr. Leszek Grzanka (Institute of Nuclear Physics and AGH) Degree awarding institution: AGH Project start: November 2022 Radiotherapy is a clinical process which could profit from advanced calculation and simulation tools. The success of radiotherapy requires a precise treatment planning. It requires the distribution of radiation dose to be optimized, in order to uniformly irradiate treatment volume as spare as much dose as possible for healthy tissues. This problem is especially challenging in modern radiotherapy techniques, like proton or ion-therapy where large amounts (up to ten thousands) of pencil beams are used to scan through the patient body.

	The aim of the thesis is to evaluate various dose optimization algorithms for proton therapy. Main focus will be put on the algorithm performance, its scalability and robustness. The student will study also the non-linear optimisation strategy which include delivering RBE-weighted dose [1] which takes into account the change of radiation effectiveness with the beam energy. [1] Algorithms for the optimization of RBE-weighted dose in particle therapy Horcicka M., Meyer C., Buschbacher A., Durante M., Krämer M., Phys. Med. Biol., 58 (2) :275-286 (2013) Sano is a new nonprofit research institute dedicated to the advancement of computational medicine, developing sophisticated computer methods for the prevention, diagnosis and treatment of disease, to meet the overarching worldwide need for efficient, effective and streamlined healthcare. We recognize that it is all about the skills of people involved in the project, to develop Sano into the world-class research centre for advanced computational medicine. We're looking for the best people around and invite all students interested in applied research within computational medicine to apply. The undergraduate programme at Sano is aimed at providing the next generation of healthcare technology innovators with unique skills. By applying, you will let us know about your interest in education at Sano. We're looking for students to work at all our Research Groups – Healthcare Informatics, Computer Vision Data Science, Modeling and Simulation, Clinical Data Science, Personal Health Data Science and Extreme-Scale Data and Computing. You are expected to: • conduct research under the direction of your supervisor; • communicate your progress at meetings and document research findings; • collaborate with students, researchers, and other Sano employees.
Profile of candidates/requirements:	Required background and skills of the candidate: • undergraduate degree – BSc, BEng or other, preferably in computer science or related field; • interest in pursuing applied research in a multi-disciplinary environment. • experience in computing for radiotherapy • excellent written and oral English communication skills.
Required documents:	Sano is an equal-opportunity 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. Do you recognize yourself in the job profile? Then we look forward to receiving your application. Applications in .pdf should include:

	• a cover letter with an emphasis on your research interests; • a curriculum vitae;
We offer:	We offer a stipend contract until the end of academic year 2022/2023 and expect the student to work on the project for approx. 16 hours per week (40% FTE). This includes attendance in courses, trainings and internal research meetings. The research will be conducted in close collaboration with supervisors at Sano and AGH. The student will receive a stipend of up to 2500 PLN gross monthly for the duration of the contract. 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. **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.**
Please submit the following documents to:	Our recruitment system: https://sano.elevato.net/en/sano-msc-project-optimization-of-dose-distribution-in-proton-radiotherapy,ja,139 We will support you in every stage of the recruitment process.
Application deadline:	October 20th 2022
For more details about the position please visit (website/webpage address):	www.sano.science
Euraxess job/stipend offer (in case of PhD and postdoc positions):	

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.
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.