PhD Position in the
Horizon Europe project HEREDITARY
HetERogeneous sEmantic Data integratIon for for guT-bRain interplaY
At the University of Applied Sciences Western Switzerland (HES-SO), Sierre, Switzerland

POSITION:
Applications are invited for a position as a PhD student in the medGIFT research group at the University of Applied Sciences Western Switzerland (HES-SO) in Sierre, Switzerland. The successful applicant will join an international team of researchers working on machine learning and multimedia knowledge extraction from exascale biomedical data. The PhD will be part of the European Horizon Europe research project HEREDITARY, made up of a consortium of 18 partners from Europe and the United States.
The objectives of the PhD are as follows:

- **Multimodal data integration:** Development of the HEREDITARY multimodal ontology, focusing on neurodegenerative diseases and using homogeneous, compressed data representations. The system employs federated learning and self-supervised methods to learn from various data types like clinical, imaging and genetic data. These are then integrated with text ontologies through advanced architectures like late fusion networks or bi-transformers.
- **Spatio-Temporal Data Harmonization & Analytics**: Release of open-source libraries targeting the harmonization of heterogeneous spatiotemporal and data acquisition information (e. g., sampling, resolution, acquisition protocol). The libraries will include statistical & machine learning tools for inferring relationships among harmonized multimodal data. Tools will address acquisition technique variability using domain-invariant models, data-driven augmentation, and synthetic data generation.

The project includes the following research fields and tasks:

- secure distributed system for multimodal health data linkage;
- semantics-aware learning methods integrating multimodal & genomics data for improving health outcomes;
- interactive data-driven solutions to empower decision-making, prevention and strengthen citizen‘s trust.

These topics are of strong interest in the exploding field of machine learning and medical data analysis. The medGIFT research group has a strong experience in publishing scientific results, so high impact publication on the PhD topics are foreseen. You will be joining a highly motivated multidisciplinary team of researchers working on related research topics.

ENVIRONMENT:

- Sierre is located in the heart of the canton of Valais and the high Swiss Alps (near Crans Montana, 4 Valles, Zermatt…). The town has around 300 days of sunshine each year and it is an excellent location to enjoy the alps for skiing during winter, for trekking or mountain biking during summer and tasting excellent wines during the entire year.
- Sierre is very central in Europe and it is well connected by train and highway. Travelling time by train to: Lausanne 1 hr 20 min; Milano 2.5 hrs; Geneva 2 hrs; Zurich 2.5 hrs; Venice: 5 hrs; Paris 5 hrs. The closest airports are Geneva, Zurich and Milano Malpensa (all served also by Easyjet).
- More on the medGIFT research group can be found at: http://medgift.hevs.ch/
- University of Applied Sciences Western Switzerland (HES-SO): http://www.hevs.ch/fr/rad-instituts/institut-informatique-de-gestion/

LANGUAGE:
The group mainly speaks English, so good knowledge of English is important. French is the spoken language in Sierre, so it is beneficial to have some notions and being willing to learn it.

SALARY:
Switzerland is a relatively expensive place, but the salary of a PhD student allows to cover all living costs easily. Finding a flat in Sierre or the environments is not hard, and the quality of life is very high.

DURATION:
The position is expected to start in January 2023. Salary is guaranteed for 4 years.

REQUIREMENTS:

- Master degree in physics, engineering, computer science, mathematics or a closely related field.
- Knowledge in image processing, computer vision, machine learning, and software development (e.g. using Python, PyTorch).

APPLICATION:
Please, send a motivation letter, a curriculum vitae, names and email addresses of two referees to:
henning.mueller@hevs.ch, manfredo.atzori@hevs.ch, marek.wodzinski@hevs.ch