Teaching profile

Teaching activities will mainly target undergraduate and graduate computer science levels, computer science department, faculty of sciences and technologies. The department is looking for the following skills: Algorithmic and programming, Database management systems (fundamentals, query optimization, database administration), data integration and data mining, decision support systems, distributed databases (Big data, e.g. MapReduce, etc.), Web technologies, Information systems security. These teachings are in the line of the strategy of our department which consists in making acquire to our future graduates the technical and methodological skills necessary for the implementation of decision-making projects. The hired person will participate to the functioning of the computer science department, particularly through reflections on developments in trainings and international openness.

Research profile

Data bases - Data flow – Big Data

The person who will be hired will lead her/his research activities in the framework of the scientific vision of the LIRIS laboratory. The person will join the database group of the "data sciences" cluster. We are looking for potential candidates with an expertise in the area of «declarative approaches to databases», the main research theme of the DataBase research group which belongs to the «Data Sciences» cluster.

Cross-fertilization between databases and other areas of computer science - such as knowledge representation, constraint programming, algorithmic and logic - are numerous and represent a major challenge to tackle the new challenges in the database area, such as those posed by «big data (analytics)».

The person who will be hired should develop database research, could it be at the system, conceptual or methodological level. All applications in the core database research themes (query languages, query optimization, indexing, ...) and/or interfaces with related areas (mentioned above) will be considered as relevant.

The ability to lead, motivate and assist young researchers, to set up and lead (national and international) research projects and to create synergies with industry and innovation are also relevant.

Importance of the scientific research direction attached to this position

Data streams are now used in all aspects of the digital world. The Web itself could be seen as an extra large data source that continuously produces new data. Data streams are in nature infinite, they bring scientific challenges for traditional database techniques, for example for integrating them and for querying them by using declarative high level languages.

Many research groups around the world are actively working in this area. There are real economical and societal impacts.

Research laboratory description

LIRIS (Laboratoire d’InforMatique en Image et Systèmes d’information) is a research center on Information Science and Technology. LIRIS is affiliated to CNRS (Centre National de Recherche Scientifique) under the label UMR 5205. The laboratory involves 320 researchers from INSA de Lyon, Université Claude Bernard Lyon 1, Ecole Centrale de Lyon, Université Lumière Lyon 2 and CNRS. It is organized in six areas of skills of 20-25 permanents. Each of the 14 research teams belongs to one of these areas:

- Computer Vision and Pattern Recognition (IMAGINE and M2DISCO research teams): automatically understanding multimedia data (images, video, digital documents, 3D scenes): acquisition/reconstruction, indexing, modeling, classification or automatic content recognition (objects, actions, concepts). Skills:
signal and image processing (filtering, segmentation, feature extraction), machine learning and pattern recognition (connectionist, statistical and structural approaches), information fusion, constraint programming, discrete and continuous optimization

- **Geometry and modeling** (GEOMOD and M2DISCO research teams): computational geometry, discrete geometry, geometric and topological modeling, 3D reconstruction and interactive creation, procedural modeling, geometry processing of meshes and discrete shapes (feature extraction, indexing and retrieval, compression, watermarking, segmentation, visualization), topological modeling

- **Data Science** (BD, DM2L and GOAL research teams): to provide adequate answers to the explosive deluge of digital data, this research group aims to promote fertilization between different complementary areas of computer sciences related to data modeling, algorithmic, graph theory and combinatorics, data mining and statistical learning or languages and systems for databases.

- **Services, Distributed Systems, and Security** (DRIM and SOC research teams): proliferation, discovery and composition of software and data services deployed over the Internet, quality of service and fault tolerance, security, trust, reputation, content adaptation and personalization, reliable information sharing and dissemination

- **Simulation, virtuality, and computational sciences** (BEAGLE, R3AM and SAA-RA research teams): this research group aims to acquire, understand, model, simulate and render our environment from the realistic simulation to mathematical modeling continuum. Along the real-virtual continuum, the following skills are acquisition / modeling / interpretation / rendering of scenes, animation, computational biology, artificial evolution, multi-scale models, perception models, reaction / diffusion models in particle systems, augmented reality, computer graphics, artificial life. On the methods plan, the following skills are present: intensive and parallel computing, scientific computing, stochastic methods, self-centered modeling, computer vision, bio-mechanical simulation, multi-physics simulation

- **Interactions and cognition** (SICAL, SMA and TWEAK research teams): this research group analyses, designs and develops dynamic digital systems in which agents (human or software systems) interact. The researchers focus both on individual properties of agents, and on properties of the system as a whole. In particular, they are interested in the cognitive abilities of those systems. Skills: knowledge dynamics and traced experience, Computer Environment for Human Learning, interactive systems, multi-agents systems

The laboratory leads research on fundamental issues in these six areas. It also develops know-how with strong impacts on society and closely with the other scientific disciplines (engineering, Humanities and Social Sciences, Environmental Sciences and Life Sciences):

- **Culture and heritage** (digital libraries, critical edition, digitization of ancient documents, archiving, 3D virtual museums …)

- **Environment et urban world**: intelligent building, 3D modeling of the cities, Geographical Information Systems, mobility, transport optimization

- **Biology and health** (data mining, complex systems modeling and analysis, e-health…)

- **Ambient intelligence** (pervasive systems, sensor networks, intelligent video surveillance, secured communicating objects…)

- **Human learning** (personalization, cognitive assistance, collaborative learning…)

- **Digital entertainment** (video games, animated cinema, multimedia data processing…)

- **Big data management**, processing, visualization