

## URL

<http://fst-informatique.univ-lyon1.fr/>

L'audition des candidats comprendra une mise en situation professionnelle selon les modalités suivantes :

- Une leçon sur un sujet imposé de niveau 1<sup>er</sup> cycle ;
- Durée de présentation : 10 à 15 minutes ;
- Non publique.

L'organisation de la mise en situation sera indiquée sur la convocation à l'audition.

Workplace:

**LIRIS**

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<http://liris.cnrs.fr/>

## Research profile

### Massive Data and Knowledge

For the next five years, the LIRIS decided to position itself in two strategic themes: 3D and Big Data (Data Science). These themes, in addition to some working groups (Ambient Intelligence, information systems security, web data and knowledge and smart cities) are active areas of research in the laboratory. This approach aims to create a dynamic background to mobilize actors on certain substantive areas such as those mentioned above.

Processing and management of massive data and knowledge bases is one of the main research activities and expertises of LIRIS. Data sets could be images, videos, text or complex/unstructured data. The profile of the position is open. We are seeking an applicant with a high scientific potential, a background and a relevant expertise to tackle one of the scientific challenges (learning, data mining, human-machine interaction, visualization, security and confidentiality, simulation ...) we are facing when it comes to handle massive data and knowledge.

The selected applicant will conduct her/his research in such a way that it complies with the research direction of concerned research groups. She/he should show a complimentary expertise in order to enhance the competencies of the research groups.

The scientific quality of the applicants, the relevance of the research project for the laboratory and its integration within a team will be the first criteria of selection.

## Teaching profile

The person to be recruited will have to invest in the various teachings of the department, especially in the 3rd years of undergraduate studies (license) and particularly in :

- Algorithms and Programming,
- web programming,
- databases, ...

He/she will also be involved in schemes to help the undergraduate students success using innovative teaching methods.

## 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 327 researchers from INSA 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 research team): 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 fertili-

zation 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 SAARA 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