Teaching profile

Within the first cycle department at INSA (NATIONAL INSTITUTE of APPLIED SCIENCES) of Lyon, the professor will teach computer science fundamentals (algorithmics, objects oriented programming in java, computer architecture, relational database fundamentals) and its applications in the creation of applets which can integrate a multidisciplinary dimension (mathematics, physics, mechanics, thermodynamics, design). The selected person will see herself entrusting important and strategic responsibilities by Head of Department. Those could be, especially, associated with animation of a multidisciplinary working group being invested as well in the definition and the implementation at the First Cycle of disciplinary and transverse competences approach both from the point of view of learning as assessments. He (she) will also have to encourage and supervise the experimentations and implementations of diverse and innovating pedagogies based on knowledge acquisitions but also competence acquisitions. To conclude these missions, the successful candidate must have shown his/her interest for training and pedagogy and his/her capacity to animate and manage teams.

Teaching department description

The First Cycle Department at INSA Lyon, given its large size (1600 students) and the diversity of its teaching staff (nearly 400 teachers), offers seven qualified training sectors: the «classical» first cycle, four internationally oriented sections, of which three are taught in French, grouping French students together with other students from Europe (EURINSA), Asia (ASINSA) or Latin America (AMERINSA), and a section taught entirely in English (SCAN); an active science training (FAS) section integrates students who did a technological baccalaureate STI2D; a High Level Sport (SHN) section is dedicated to the first cycle education of athletes. Although these courses are run independently, the common objective remains the rigorous initial training of scientists, who possess the human qualities and open-mindedness that are essential for any engineer. The role of the first cycle is to take the student from the status of secondary-school pupil to that of a future INSA engineer. The students receive an education that is the scientific, technical and human basis required for entering the specialist departments of the engineer’s cycle. The general training is essential for giving every INSA engineer the solid core skills and knowledge to enable them to reorient themselves in mid-career, whatever their specialization.

Research profile

The selected candidate will join the IMAGINE research team of the LIRIS Laboratory (UMR 5205 CNRS). The different research activities of Imagine team share the same general objectives aiming at automatically understanding multimedia data (images, video, digital documents, 3D scenes). They focus on acquisition/reconstruction, indexing, modeling, classification or automatic content recognition (objects, actions, concepts). The concept of «visual object» at the heart of this work is a common denominator for this team. The researchers of this team propose gateways to cross the semantic gap between low-level descriptors contained in raw images and representations of higher semantic levels (modeling, classification and identification). They have recognized skills on signal processing (filtering, segmentation, feature extraction), machine learning and pattern recognition (connectionist, statistical and structural approaches), information fusion. The selected candidate must have strong and internationally recognised expertise in computer vision and pattern recognition. The candidate will contribute to develop national et international research projects and will participate to the animation of local, national and international research community. More specifically, the selected candidate has to present skills in digital documents processing (dematerialization of documents, the search for innovative solutions to process images of degraded documents, contextualized recognition of heterogeneous or
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 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