



ÉCOLE
CENTRALE LYON

DESCRIPTION OF THE POSITION OF TEACHER-RESEARCHER

POSITION: Senior teacher-researcher under contract

Mathematics and Computer Science Department

LIRIS Laboratory

Description: Senior teacher-researcher in data science under contract

Keywords: Data science, Artificial Intelligence, Human/Machine Interactions, Machine learning.

Information

Reference:

Type of contract: teacher-researcher (fixed term contract)

Section CNU: 27

Provisional date of recruitment: 01.09.2023

Place of employment: campus of Ecully

Application deadline: 5th of April 2023

Introduction

The Ecole Centrale de Lyon (ECL) is a public establishment with a scientific, cultural and professional (EPSCCP) vocation. Since 1 January 2021, the Ecole Nationale d'Ingénieurs de Saint-Etienne (ENISE) (National Engineering School of Saint-Etienne) has been merged with the Ecole Centrale de Lyon as an internal school.

A member of the Group of Ecoles Centrales and the network of National Engineering Schools, the ECL trains high level general and specialised engineers, Master's and PhD students. The establishment receives 2,500 student engineers (students and apprentices), 300 Master's students and more than 250 PhD students. The school is recognised for its research activities carried out by 6 research laboratories, all of which are CNRS Joint Research Units. ECL's research activity is oriented towards the corporate world through a large number of contracts with industrial companies.

The school has 195 positions for teacher-researchers and teachers and employs 261 BIATSS personnel to which must be added 90 CNRS personnel. Its consolidated budget including all the salaries of the personnel and contractual research activities is close to €61 M.

The establishment is a founder member of the "University of Lyon" Community of Universities and Establishments.

Involved in more than 15 clusters and national and international networks, the school has signed many agreements with foreign establishments with respect to both research and teaching.

Description of teaching

In 2023, The Ecole Centrale Lyon and the emlyon business school have started a new programme called "Bachelor of Sciences in Data Science for Responsible Business". This 4-year BSc degree programme is aimed at training students capable of using data science and artificial intelligence at the service of responsible companies for more sustainable development. The programme, taught exclusively in English, places emphasis on practical work with 15 months of internships and provides 3 specialised orientations (data science, research and entrepreneurship). A detailed description is available at the following address: <https://em-lyon.com/emlyon-business-school-et-lecole-centrale-de-lyon-lancent-un-bachelor-science-data-science>

The person recruited will be responsible for the academic management associated with the programme in collaboration with the academic director (emlyon). It includes the pedagogical management of the BSc teachers and the operational management of the programme on behalf of the Ecole Centrale de Lyon (recruitment and enrolment of students, supervising the students, recruiting teachers, developing partnerships with academic establishments and businesses, etc.).

He or she will mainly carry out their teaching duties in this curriculum on the themes of fundamental computer science (algorithms, programming, software development), and also in the field of data science and artificial intelligence (data analysis, machine learning, deep learning, natural language processing). These courses must be given in English, thus perfect mastery of this language is required.

In addition, involvement in other curricula of the Ecole Centrale Lyon (engineer, Master) may be considered regarding the subjects in which the applicant is expert.

Basic conversational skills in French are desired for non-French-speaking applicants. A "French as a foreign language" training course could be offered by the establishment when the applicant is recruited for the position.

Research profile

The research activities developed will be organised around the themes of the SICAL "Situating Interaction, Collaboration, Adaptation and Learning" and Imagine "Computer vision, Machine Learning, Pattern recognition" teams of LIRIS at the ECL, to strengthen the Laboratory's response to the challenge of "Data science and Artificial Intelligence". The following provides two examples of possible themes that exploit the synergies of the activities of the 2 research teams SICAL and Imagine at the ECL. The applicant can propose another research theme provided that he (she) utilises his (her) AI expertise and combines it with either a theme existing at the interface of the two teams or a theme linked to the research works of one of the two teams at ECL.

Intelligent human-machine collaboration for explainable, controllable and responsible AI

Systems using IA are increasingly present in our environment without users being able to understand how they function or even being aware of their presence or impacts, thereby leading to a lack of control and a loss of confidence. However, in constantly changing environments, human beings are essential for solving complex problems that have never been dealt with previously or which are difficult to formalise. A responsible society must ensure that AI and the technologies associated with it are placed in the service of human beings and not the contrary. Our control of technology requires that human beings are placed at the centre of the design process, and rethinking how computer systems are incorporated in human activities, by taking account of their complexity, passing from the paradigm of "human in the loop" to that of "machine in the loop". This issue is situated at the

interface of the research works of the two teams, SICAL and Imagine, at the ECL (machine learning / interaction and visualisation) and exploits their synergy by combining the AI expertise of the applicant to develop the adaptability of computer systems, and the explainability and control by human beings of the AI integrated in these systems, by giving meaning to the data handled.

Robot learning for shared human/robot control

Faced with a complex, unknown and changing environment, a robot system must have the capacity to learn, enabling it to adapt quickly to efficiently carry out the tasks given to it. This capacity can be facilitated by controls that are shared by the robot system and human beings. Using sensors and intuitive interfaces, the latter can therefore guide the robot system in semi-autonomy, thus helping it to learn. This issue is situated at the interface of the research works of the SICAL and Imagine teams at the ECL (machine learning / interaction) and makes use of their synergy by combining the applicant's AI expertise to develop human/machine collaboration in the framework of a shared control strategy making it possible to perform complex robotic tasks.

Furthermore, in their capacity as senior teacher-researcher, the applicant is expected to have experience of supervising PhD and post-doc students and act as a driving force in the development of partnerships involving the teams of LIRIS at the Ecole Centrale in the framework of responses to regional, national and international calls for projects.

Insofar as the teacher-researcher will have to carry out their research activity in a protected research area (ZRR), their appointment shall depend on the authorisation of the Defence Security Officer.

Profile of the Institution _____

The establishment expects that the applicant, in their capacity as a senior manager, participates in the efficient running of the institution and contributes to the formulation of the school's strategic development projects.

Status of the position _____

Method of recruitment: recruitment after classification by the Selection Committee, validation by the Board of Management restricted to teachers-researchers, and the decision of the Director of the ECL.

Working hours: equivalent of 192H of tutorials and group work annually.

Type of contract: fixed term contract of three years with possibility of renewal.

Remuneration: on the basis of the salary grids of University Professors/Research Directors. Seniority is taken into account according to the recruitment reclassification rules for public researchers and teacher-researchers.



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To apply

Deadline for application: 5th of April 2023

Application link: <https://ecolecentraledelyon.recruitee.com/l/en/>

Contacts:

Teaching: Romain Vuillemot (for the BSc) – romain.vuillemot@ec-lyon.fr,

Alexandre Saidi (for the general and Master's curricula) – alexandre.saidi@ec-lyon.fr

Research: Emmanuel Dellandréa – emmanuel.dellandrea@ec-lyon.fr

Composition of the application file (documents to be provided):

Degree required: PhD

Documents required:

- Declaration of application and letter of motivation dated and signed.
- Identity card (or passport) with photograph.
- Curriculum vitae providing an analytical presentation of work, books, articles, productions and activities.
- Copy of PhD degree and report of the defence of PhD thesis.
- Report of the defence of PhD thesis.

- Certificate of experience of supervising PhD or post-doc students. This experience can be vouched for by the Diploma of Authorisation to Direct Research (HDR) or equivalent diploma (Dozent or Docent, associate professor, aggregation in higher education, authorisation for higher education, etc.). For applicants who do not present an HDR or equivalent diploma, they are expected to present documents vouching for their experience in supervising theses defended successfully.

Administrative documents in foreign languages must be translated into French.