

**FICHE NAVETTE: DOCTORANTS IDEX**

SECTOR : Higher Education Institution

LOCATION: France, Grenoble

RESEARCH FIELD: **Collaborative work for an agile remanufacturing chain**

RESEARCHER PROFILE:

□ *First stage researcher,*

**INSTITUTION: Univ. Grenoble Alpes, University of Innovation**

One of the major research-intensive French universities, Univ. Grenoble Alpes\*\*1 enjoys an international reputation in many scientific fields, as confirmed by international rankings. It benefits from the implementation of major European instruments (ESRF, ILL, EMBL, IRAM, EMFL\*2). The vibrant ecosystem, grounded on a close interaction between research, education and companies, has earned Grenoble to be ranked as the 5th most innovative city in the world. Surrounded by mountains, the campus benefits from a natural environment and a high quality of life and work environment. With 7000 foreign students and the annual visit of more than 8000 researchers from all over the world, Univ. Grenoble Alpes is an internationally engaged university.

A personalized Welcome Center for international students, PhDs and researchers facilitates your arrival and installation.

In 2016, Univ. Grenoble Alpes was labeled «Initiative of Excellence ». This label aims at the emergence of around ten French world class research universities. By joining Univ. Grenoble Alpes, you have the opportunity to conduct world-class research, and to contribute to the social and economic challenges of the 21st century ("sustainable planet and society", "health, well-being and technology", "understanding and supporting innovation: culture, technology, organizations" "Digital technology").

\* ESRF (European Synchrotron Radiation Facility), ILL (Institut Laue-Langevin), IRAM (International Institute for Radio Astronomy), EMBL (European Molecular Biology Laboratory), EMFL (European Magnetic Field Laboratory)

**Key figures:**

- + 50,000 students including 7,000 international students
- 3,700 PhD students, 45% international
- 5,500 faculty members
- 180 different nationalities
- 1st city in France where it feels good to study and 5th city where it feels good to work
- ISSO: International Students & Scholars Office affiliated to EURAXESS

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<sup>1</sup> Univ. Grenoble Alpes

## **MANDATORY REFERENCES:**

CDP TITLE: **Circular Industrial Systems**

SUBJECT TITLE: Defining the learning conditions of the workers in the digitalized remanufacturing industry

PRIMARY SCIENTIFIC DEPARTMENT (LABORATORY'S NAME): PACTE (politique action publique territoires et organization)

SECONDARY SCIENTIFIC DEPARTMENT (LABORATORY'S NAME): LIP (Laboratoire interuniversitaire de psychologie)

DOCTORAL SCHOOL'S: ED SHPT

SUPPORTER'S NAME: Sandrine Caroly (PACTE), Aurélie Landry (LIP)

## **SUBJECT DESCRIPTION:**

### **Context and objective:**

The remanufacturing productive system products new working situations for workers. This organization demands human agility to adapt and to develop Human-Machine collaboration and cooperation between workers. The aim of this thesis is to define new roles and competencies that workers will need in a circular industrial system. The stakes are to understand the learning conditions of workers in the digitalized remanufacturing industry.

In production systems, tasks are often defined by standards and workers develop the capacity to manage different work situations. The human mobilizes their experience of work situations to improve the efficiency and preserve occupational skills (Gaudart, Weill-Fassina, 2000). In agile system, the human activity is disrupted. The worker is constantly in a situation of adaptation to manage technical and temporal requirements of robots. Tasks define the workstations interaction mediated by numeric tools. The agile organization depends on human factors: knowledge of cognitive strategies (reasoning, operative regulation, diagnosis, decision-making) and physical conditions of tasks (movement, dependence of machine, handling, visual perception). The workstation context facilitates the learning conditions: for e.g. workstation improve the movement in different dimensions on human activity (physiological, social and psychological) (Simonet, Caroly, Clot, 2008). The challenge of carrying out interventions in working environments consists in creating the right conditions to express and examine the resources that can be used to develop more efficient and health-friendly automatism. One way could be the use of tools like "simulation of future work conditions" to design workstation adapted. This methodology aids the intervention for designing agile remanufacturing process. The constructive approach in ergonomics (Falzon, 2004) is expected to produce knowledge about the resources in this occupational context that develop the skills to adapt various working situation along product flow.

Furthermore, the agile organization depends on cooperation between different workers. To obtain quality, efficiency and occupational health, collective work is essential (Caroly, 2010). The production organization impacts the steps of equipment maintenance, cleaning and changes of series. The dependence in collective organization increases the pressure and the risks of misunderstanding and dysfunctions. But the efficient cooperation is founded on collective competencies (Darses, Falzon, 2004): synchronization of Human-Machines interaction, mutual aid in team to exchange data information about decision process. The development of collective competencies depends on organization design which facilitates the worker-machine-team cooperation.

### **Methods:**

To design guidelines on the work cell, and the organization, enabling human to carry out the activity for his/her performance, learning and health in an agile organization, the methodology concerns 3 steps following the project:

- 1/ 12 month: An observation grid dedicated to the « Industry of the future » work situations Application of the grid on 10 case studies,
- 2/ 24 month: Design recommendations favoring the learnings and skills development at the cell level,
- 3/ 36 month: Design recommendations favoring the learnings and skills development at the organization level.

Several observations of working situations using cobot and numerical devices will be used to design new analysis grids for the improvement of the working conditions. The grid will be established and tested in different companies

and contexts in view of its generalization. The study realized in ARaymond platform, baxter robot, S-mart Platerform and other companies in France or Europe. The simulation and experiment system of learning condition is required to produce the expertise and line organization.

### **ELIGIBILITY CRITERIA**

Applicants:

- must hold a Master's degree (or be about to earn one) or have a university degree equivalent to a European Master's (5-year duration),

The candidate should ideally have a Master's degree in ergonomics, occupational psychology or a diploma of safety and security engineer, of industrial design engineer.

### **REQUIRED SKILLS**

- Theoretical skills: Knowledge in Knowledge in ergonomics, occupational psychology, industrial design, sociology.

- Methodological skills: Mastering the methods of social science research and ergonomics design: observations, interviews, focus groups and meetings with stakeholders. Methods of activity analysis and simulations of future work. Methods of project design.

- Language: A good level in French and English is an asset.

Applicants will have to send an application letter in English and attach:

- Their last diploma
- Their CV
- A short presentation of their scientific project (2 to 3 pages max)
- Letters of recommendation are welcome.

Address to send their application: Sandrine Caroly ([Sandrine.caroly@univ-grenoble-alpes.fr](mailto:Sandrine.caroly@univ-grenoble-alpes.fr))

Auréliie Landry ([aurélie.landry@univ-grenoble-alpes.fr](mailto:aurélie.landry@univ-grenoble-alpes.fr))

### **SELECTION PROCESS**

Application deadline: **31 may 2018** at 17:00 (CET)

Applications will be evaluated through a three-step process:

1. Eligibility check of applications in **June 7, 2018**
2. 1st round of selection: the applications will be evaluated by a Review Board in june 2018. Results will be given in july, 12, 2018.
3. 2nd round of selection: shortlisted candidates will be invited for an interview session in Grenoble on july, 2018. (if necessary)

TYPE of CONTRACT: temporary-3 years of doctoral contract

JOB STATUS: Full time

HOURS PER WEEK: 35

OFFER STARTING DATE: **October 1, 2018**

APPLICATION DEADLINE: **May 31, 2018**

Salary: between 1768.55 € and 2100 € brut per month (depending on complementary activity or not)

**Financements de la thèse** : si co-financements, préciser la durée de chacun des financements et l'organisme ou l'institution partenaire