

Research Master Internship

Aide à la décision pour la conception de systèmes Produits-Services Decision Support System for the Design of Product-Service Systems (PSS)

Domaine Scientifique	Génie industriel ou Génie mécanique – Conception de Systèmes – Aide à la décision
Laboratoire :	LIMOS/Institut FAYOL - Ecole des Mines de Saint Etienne,
Encadrant:	Pr. Xavier Boucher (et coencadrant) Institut Fayol, Equipe GEO.
Rémunération:	Allocation de stage (500 €/mois)
Contexte Industriel :	Conception d'une offre PSS pour un Robot autonome de nettoyage industriel
PhD :	Possibilité d'offre de thèse ultérieure pour un candidat de qualité.
Dates :	Mars à Aout 2018.

Résumé des objectifs : Inséré dans une équipe de recherche collaborative, vous participez au développement d'une méthode pour la conception de systèmes produits-services. Le stage de Master est développé sur un cas industriel réel actuellement traité dans l'équipe. Votre travail aboutira à enrichir une plateforme de simulation pour la configuration de chaînes de création de valeur destinées à délivrer des PSS. La valeur ajoutée du stage se focalisera sur la prise en compte de l'incertitude dans les modèles d'évaluation des performances.

Keywords: Product-Service Systems, Decision Support Systems, Uncertainty models, Simulation, Economic model

Context and objectives

PSS (integrated 'product and service' offers) represent an emerging solution for several economic and environmental problems and can bring benefits for all actors involved in the value creation chain. However, designing a PSS is a complex engineering process, which go beyond the use of traditional design methods because of (i) the necessity to integrate both product and service design, (ii) the introduction of an enlarged vision on value creation requiring to manage the flexible configuration of collaborative value creation networks, (iii) the change of economic model induced by selling usage and no more product.

A simulation platform dedicated to evaluate the economic performance of PSS value creation network (multi-enterprise networks) has been developed at FAYOL Institute. A specific version of this platform has been currently applied to a real industrial context of designing an autonomous robot for industrial cleaning. The platform is called PS3A.

This Master subject aims at contributing to the improvement of PS3A platform, with the objective to integrate uncertainty in the simulation model, and to contribute to make possible to analyze economic risks from the point of view of the industrial actors simulated by the platform.

- General state of the art on the domain of economic evaluation and simulation of PSS value networks.
- Specific state of the art on the various types of uncertainty in this context and the various models for uncertainty representation.
- Acquisition of competencies on the industrial case study and the current simulation platform.
- Conceptual proposition on the types/problems of uncertainty which should be considered as pertinent to be integrated within the simulation platform. Proposition of a model of uncertain representation for some of these problems.
- Implementation of the model in the simulation platform and experimentation on the case study, to contribute to risk analysis.

Research Laboratory and PhD opportunity

The research is developed in a team internationally recognized on these topics (see for instance IPSS2015, organized at Mines St Etienne, <http://ipss2015.emse.fr/>). For a good candidate the master project can lead to a PhD thesis.

Candidate Profile

Research Master student from a French or European Master program, in one of the following scientific area:

- Industrial management, Manufacturing Systems (Génie industriel, Génie des systèmes industriel, Chaines logistiques, Systèmes de production)
- Mechanical Sciences (Génie mécanique, conception de systèmes avec double compétence en systèmes de production).
- System Design (Sciences de la conception, conception des systèmes)

Competencies expected on some of these issues:

- Modelling and design of industrial systems or logistic chains or value creation networks
- Uncertainty representation
- Decision-making, Decision Support Systems
- Performance evaluation applied to industrial systems (notably economic performance)
- Simulation of industrial systems or logistic chains

Candidature submission

Dead line : as soon as possible.

Candidature by : Curriculum Vitae + motivation letter + transcripts of the 2 last years of study

Please send your candidature to : boucher@emse.fr

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Références bibliographiques

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2. Boucher X., Brissaud, D., Shimomura Y. Edts, Design of sustainable Product Service Systems and their Value Creation Chains, Special Issue of CIRP Journal of Manufacturing Science and Technology, Volume 15, November 2016, pp. 1-2.
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