



## PhD Proposal 2017

<b>School: Ecole Centrale de Lille</b>	
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<b>Collaboration with other partner during this PhD: In France: Co-Supervisor: Sarah BEN OTHMAN</b>	<b>In China:</b>

<b>Title: Design and optimization of a Health decision support in dynamic and distributed environment</b>
<b>Scientific field: Optimization, Industrial computing, health logistic</b>
<b>Key words: health indicators, data mining, fuzzy logic, optimization, scheduling, multi-agent systems, distributed artificial intelligence</b>

### Background, Context:

The management of logistic systems in the health sector is on the rise. This domain aims to deploy effectively technical and computer resources in order to optimize time management, reduce the risk of errors and anticipate the tension in a domain where the human factor is very present. Tension state within health institutions can be described by indicators related to internal factors such as: the increasing of patients' number, the increasing of the complexity of cases, the lack of healthcare frames outside working hours, the lack of beds, the proliferation of diagnostic tests, the increasing of waiting time of patients, etc. Experienced practitioners can identify the most meaningful indicators but the inaccuracy of data often requires the implementation of defaming systems for the search and the retrieval of knowledge from distributed, imprecise and imperfect data, in order to permit identification of consistent indicators and so anticipate the risk

## Research subject, work plan

The research project is to design, optimize and put into practice a decision support system for optimization and dynamic scheduling of medical activities. This system must be the main logistic engine of health institutions for a better efficiency in terms of care, human and material resources management, pricing of medical activities and risks anticipation. The system must interact with a distributed, dynamic and uncertain environment, and simulate, as faithfully as possible to reality, the propagated logistics flows, the medical personnel activities, their behaviours and movements in health institutions.

## References:

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- [2] Ajmi I, Zgaya H, Gammoudi L, **Hammadi S**, Renard J-M. Dynamic modeling of the patient journey in a Pediatric Emergency Department of CHRU of Lille. *International Journal Of Computers & Technology (IJCT)*. 2014 February 11, 2014;12(6):3580-90. **IF 1.532**.
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