PhD Position

Decrease the energy consumption of the recycled pulp stock preparation in setting up a control/command system based on image analysis of the pulp suspension.

Localization:
Laboratoire de Génie des Procédés Papetiers UMR 5518 [CNRS – Grenoble INP-Agefpi]
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Beginning of the project:
The pHD will get in force in the last trimester of 2015.

Project description:
Nowadays, it is important, when developing new products, to take care about the environmental aspect. Their Life Cycle Analysis takes into account their recycling. For paper, the recycle rate achieves 72% at a European level. Recycled papers are composed of fibres, fines, mineral fillers and others contaminants like stickies and ink particles.
The recycling process begins with a stock preparation which includes:

- Disintegration
- Cleaning
- Deinking and hot dispersion
- Refining stage

In order to rationalize the production flows, each unitary operation have to be optimized, specially the disintegration step and the efficiency of the cleaners. With the development of the computer capacities and the quality of the color cameras, the use of the image analysis is a promising way to develop new devices for pulp suspension characterization and so to propose new control and supervision tools.
The scientific key point related to this project is the morphological characterization by image analysis of pulp elements in suspension at medium consistency. Some protocols still exist but give only a flocculation index.
In this study, a fine description of the flocs and others objects will be established particularly by taking into account the shape, the color and the hardness. For this last point, a specific measurement cell will be build-up (case of a recirculation loop).

Also, a prototype has to be created dealing with the screener efficiency.

This work is in relation with the historical activity of the laboratory which is the optimization of the paper production. It will be funding by the Doctoral School of Grenoble University (I-MEP^2).

Competencies of the applicant:

The applicant has to know about image analysis and programming and its experimental skills have to be further proved. Good oral and written communication skills are requested.

Contacts

If you are interested in or for further information, please contact Denis Curtil and Raphaël Passas before the 15th of May 2015.

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