Guest Editorial

This particular issue of the Journal of Cement and Concrete Composites contains 20 papers devoted to the use of automatic image analysis in the field of cement, mortar, concrete and fibre reinforced concrete materials. It is surprising that few of these papers originated from outside France, although more than 30 laboratories in Canada, Europe, Hong Kong, US, etc. were solicited. This may demonstrate the higher sensitivity of French laboratories on image analysis, probably linked to French School of mathematical morphology.

The main objective was to give a correct and full overview on the different possibilities of investigating the morphology of civil engineering materials by automatic image analysis, and also to show how it is possible to use automatic image analysis to quantitatively characterise such morphology. It also gives basic knowledge to the reader interested in developing the technique in his own laboratory.

Although, over many years, manual or semi-automatic methods have often been proposed, and are still used in several laboratories, it is now possible to use fully automatic methods. These methods offer a true quantitative measurement and allow access, for example, to some morphological parameters on dispersion, homogeneity and to models that cannot be reached in any other way.

The different papers of this issue concern the following themes:
- particle grain size;
- morphological characteristics of the interfacial transition zone;
- hydration process, dispersion, mean-distance and orientation of phases;
- 3D analysis of surfaces;
- morphology of microcracks.

They are introduced from a scientific point of view in the first paper. These different papers achieve a true overview of the possibilities of automatic image analysis.

The subject matter of this special issue is of particular interest to the editor in chief of this journal, Prof. Narayan Swamy of The University of Sheffield, who asked me for such an issue. I would like to thank him for this opportunity.

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