# SS13: Image processing and computer vision using fuzzy techniques

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Fuzzy techniques (within soft computing techniques) are able to deal and handle imperfect information. This ability made them very useful for many applied areas, such as image processing or, more generally, computer vision, since imperfect information arises in almost every step of any computer vision application. This special session focuses on presenting original developments in this area, going from image processing to high level processing of computer vision or image understanding.

In this special session 9 works are presented. A total of 29 researchers coming from 5 countries (Spain, China, Japan, United States and Czech Republic) participate in these works. The special session covers several topics of image processing and computer vision, such as edge detection, segmentation, sharpening, magnification, inpainting and plate recognition. Specifically, the works of this special session are:

- "A fast edge detection model combining mixed $L_1$ and $L_2$ fidelity terms", that presents an edge detector based on the Mumford-Shah model;

- "Automatic License Plate Recognition in Difficult Conditions-Technical Report", that reports a software system for the transcription of car plates in images;

- "Single Frame Super Resolution using Bilateral Filter", that proposes a super resolution method that emphasizes edges removing noise;

- "Hyperspectrum comparison using similarity measures", that studies the application of fuzzy similarity measures in hyperspectral imaging;

- "Generalizing an Interval-Valued Magnification Algorithm Using Homogeneity Measures and Interval Fusion Functions", that incorporates interval techniques in image magnification algorithms;

- "Image inpainting using colour and gradient features", that proposes a patch-based algorithm for inpainting color images;

- "Scale-Space defined from Image Fuzzy Sharpening", that presents an image enhancement algorithm based on a fuzzy-numerical descriptor of images;

- "An Iterative Algorithm for Image Inpainting Using Aggregation Functions", that proposes a novel inpaniting algorithm based on aggregation and penalty-based functions;

- "Preliminary study on an improved weight updating for fuzzy c-means with applications to image segmentation", that studies new methods of updating weights in the FCM algorithm for image segmentation.

All these proposals have their basis on strong theoretical developments in the field of fuzzy theory and fuzzy techniques, showing their potential applicability. In this sense, this session may be of interest for theoretical scientists of the fuzzy community. Moreover, it also allows researchers on the topic of image processing or computer vision to share their last developments and to build or strengthen collaborations among them.