

SMART VISION CHIP for colon exploration

Doctorant: CHUQUIMIA orlando

Abstract— The Wireless capsule endoscopy (WCE) is used for noninvasive gastrointestinal tract examination. Our NAuTILES project propose to integrate a Smart Vision Chip (SVC) into a WCE. This SVC is a multimodal embedded architecture for polyp recognition and classification. Helped by this SVC, the WCE transmits only images that contain polyps and then reduce the number of images to be transmitted, increasing the energetic autonomy of WCE and providing opportunities to increase the image quality. We propose to use fuzzy trees as classifier inside the SVC. We have already construct a learning database and a test database from 18910 images containing 3895 polyps images validated by gastroenterologists. From the images inside these databases we extract luminosity and texture features of each region of interest (ROI) that can contain a polyp. We use these features to train 34 fuzzy trees with our learning database, and make validation with our test database. We have also investigate the construction on a fuzzy forest to increase the polyp recognition rate. We obtain a sensitivity of 93.97%, a specificity of 88.57% and a false detection rate of 11.33% that is at the state of the art.