

### **Companding Roentgen Images and MRI (Ramot)**

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### **Robust Adaptive Features Tracking (RAFT) -with application for cardiac MRI (CMRI) stabilization**

A generic and innovative approach for highly-sensitive deformable feature tracking, which can be used for medical-image stabilization (e.g. CMRI, PCI).

Optimization of medical-images such as Cardiac-MRI (CMRI, TC-short-axis slice) and Percutaneous Coronary Intervention (PCI) is regarded as a difficult problem, due to diaphragm and cardiac motion throughout the respiratory and cardiac cycles. We suggest an adaptive novel system to stabilize CMRI video at the region of interest in order to assist analysis and perhaps even during PCI. Image-stabilization is done by solving the feature-tracking problem, based on unique texture features, for the region of interest (ROI) and the contour that folds it.

### **Companding high dynamic range MRI medical images**

The common MRI images are presented to the physicians with normalized values of the HDR images. The challenge to compand the original HDR images to LDR images (that can be presented on standard monitors) is not trivial and common solutions to the different body tissues is not identical. For example, the breast tissue does not contain any sharp edges, therefore we need to develop unique textures for companding while also enhancing such edges. We started to compand such MRI images, while enabling diagnosis of the malignant areas. We also try to enhance inflammation regions in images in which these findings are not clear. The next stage will be improved with the radiologists of Sheba hospital.

Segmentation and classification of clinical findings in MRI medical images- e.g. liver and breast tissue. Liver segmentation and pathology classification are common and essential steps in any liver diagnosis, manually done by radiologists. Obtaining an automatic tool for assisting the radiologists is therefore desired goal. We suggest a novel algorithm, based on a texture feature descriptor which inspired by human-vision. Our algorithm will be developed in the level-set framework, using our lab's technologies and will finally be verified with cooperation of Sheba hospital.

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