CIDMA CENTRO DE I&D EM MATEMÁTICA E APLICAÇÕES
CENTER FOR R&D IN MATHEMATICS AND APPLICATIONS

universidade de aveiro
Departamento de Matemática

Seminário OGTC

Optimization, Graph Theory and Combinatorics

25 de setembro de 2019
(15h00–16h00 — Sala Sousa Pinto)

Optimization in Modelling the Ribs-Bounded Contour in Computer Tomography Scan Slices

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Resumo

Radiologists need to find a position of a slice of one computed tomography (CT) scan in another scan. The image registration is a technique used to transform several images into one coordinate system and to compare them. Such transversal plane images obtained by CT scans are considered, where ribs are visible, but it does not lessen the significance of our work because many important internal organs are located here: liver, heart, stomach, pancreas, lungs, etc. The new method for analyzing transversal plane images obtained by computer tomography (CT) scans is presented. A mathematical model that describes the ribs-bounded contour was created and the problem of approximation is solved by finding out the optimal parameters of the model in the least-squares sense. It will be disclose the problems that appear in building the proper model. The model is flexible and describes the ribs-bounded contour independently on the patient age, sex and disease. The only exception is patients with the bone fracture. Such a model would be useful in the registration of images independently on the patient position on the bed and of the radiocontrast agent injection. The method is examined on real CT scans seeking for its best performance.

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