Honors Thesis
Defense

Application of Global Optimization to Image Registration

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Abstract: Given two images, image registration aims to transform an image into a given reference image so that the two images look alike. This technique is vital in many applications, such as medical imaging and astronomy. Finding the best transform can be phrased as solving a mathematical optimization problem. Due to the non-convexity of the objective function, commonly employed optimization techniques often generate local minimizers, limiting the accuracy of the registration. This thesis evaluates the applicability of a global optimization method, called as DDNCID, for image registration. Direct application of DDNCID in image registration could cause minimizers to be infeasible. Thus, a focus of this thesis is to add a bound constraint by imposing a barrier function into the objective function to extend DDNCID.

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