Parallelized Packing of Squares in Squares

Jose Hoyos Sanchez
College of Engineering and Computer Science
University of Central Florida
Orlando, Florida
email@knights.ucf.edu

***Abstract*—This paper addresses a combinatorial optimization problem of packing congruent squares into a larger square container, which may be called the "squares in squares" packing problem. This problem involves determining the optimal arrangement of n congruent squares within a larger square such that no squares overlap and the container size is minimized. Few solutions have been mathematically proven optimal. For most values of n, the best known optimization has been obtained computationally. This work expands on one such computational approach in the literature by introducing parallelization, thus leveraging the power of modern processors. With parallelization, tightly packed solutions can be more readily explored for higher values of n. We present an approach that parallelizes the algorithm of Thierry Gensane and Philippe Ryckelynck, significantly reducing computation time while maintaining or improving the quality of the solutions.**

***Index Terms*—combinatorial optimization, square packing, parallel computing**