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An Attractor-Repeller Approach to Floorplanning

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Abstract The Floorplanning (of facility layout) problem consists in finding the optimal positions for a given set of modules of *fixed* area (but perhaps varying dimensions) within a facility such that the distances between pairs of modules that have a positive connection cost are minimized. This is a hard discrete optimization problem; even the restricted version where the shapes of the modules are fixed and the optimization is taken over a fixed finite set of possible module locations in NP-hard. In this paper, we motivate and derive the AR (Attractor-Repeller) model which is designed to improve upon the NLT method of van Camp et al. This new model is designed to find a good initial point for the solver of the van Camp et al. model and has the advantage that it can be solved very efficiently using a suitable optimization algorithm. Preliminary numerical results demonstrating the potential of the AR model are presented.