Permutation problems have always been an important issue in the field of optimization since many real-world problems find a natural representation of the solutions as permutations. In the 90s, when the study in the evolutionary computation focused on canonical genetic algorithm, many different crossover operators for permutation problems have been proposed. These operators embed the idea of linkage learning, and different operators learn different linkages. For example, PMX emphasizes relative order, while EX emphasizes adjacency. In 200x to 200x, (Tsutsui et al.) proposed EHBSA and NHBSA, where a centralized model (NH for NHBSA; EH for EHBSA) is built. Along with the development with EDAs, cerberio proposed a mallow xxxxx for the ordering problems. They improved the performance of their algorithm (name?) by using a new distance measure a year later.

When using the above algorithms, one need to choose carefully since different algorithms aim at permutation problems with different semantics.