

"Guided Local Search for the Vehicle Routing Problem"

(GLS)

a memory-based method

it operates by augmenting the cost function with a penalty term

based on how near the search moves to previously visited local minima.

thus encouraging diversification.

对局部最优施加惩罚因子。

Search Method

GLS: 不在 local optimal 附近寻找 对目标函数进行局部修改。

① 特征集合 F , 特征 $i \in F$ 的指标 f_i

$$f_i(S) = \begin{cases} 1 & \text{特征 } i \text{ 在 Solution } S \text{ 中} \\ 0 & \text{otherwise} \end{cases}$$

② C_i 是特征 i 的 cost.

③ 惩罚因子 λ

an augmented objective function:

$$O'(S) = O(S) + \lambda \sum_{i \in F} f_i(S) p_i C_i$$

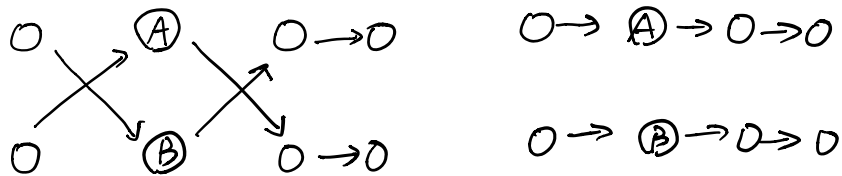
p_i 特征 i 被惩罚的系数。

Vehicle Route:

- ① Feature Set arcs 边, 两个客户之间的边.
- ② Feature Cost: 对应边的长度 C_a .
- ③ Penalty factor λ : $0.1 \sim 0.3$
- ④ Local Search (S, p):

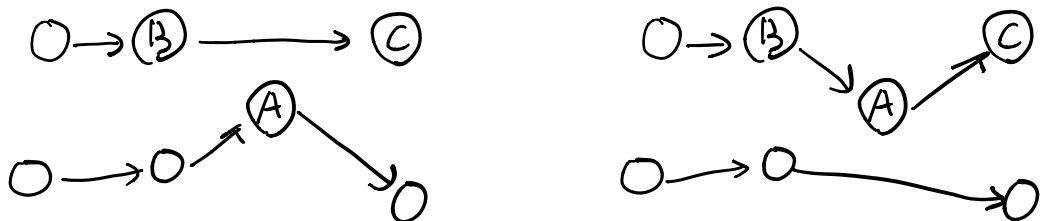
4种 Local Search 技巧, 接受最好的排列.

- ① neighbor-exchange 交换2条路径上的2个 Node点

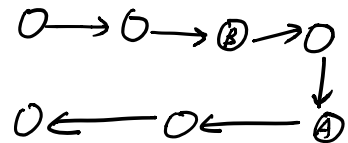
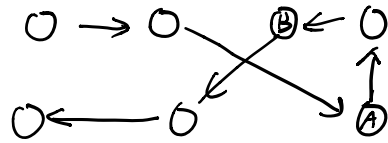


- ② neighbor-relocate

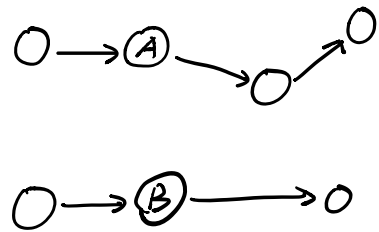
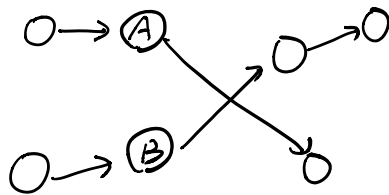
将一个 Node 从路径中删去再插入另一条路径.



③ 2-opt 一条线路交换两点



④ Cross 选中节点 前面不换,后面换.



思想: 参数 λ , penalty 自适应的调节.