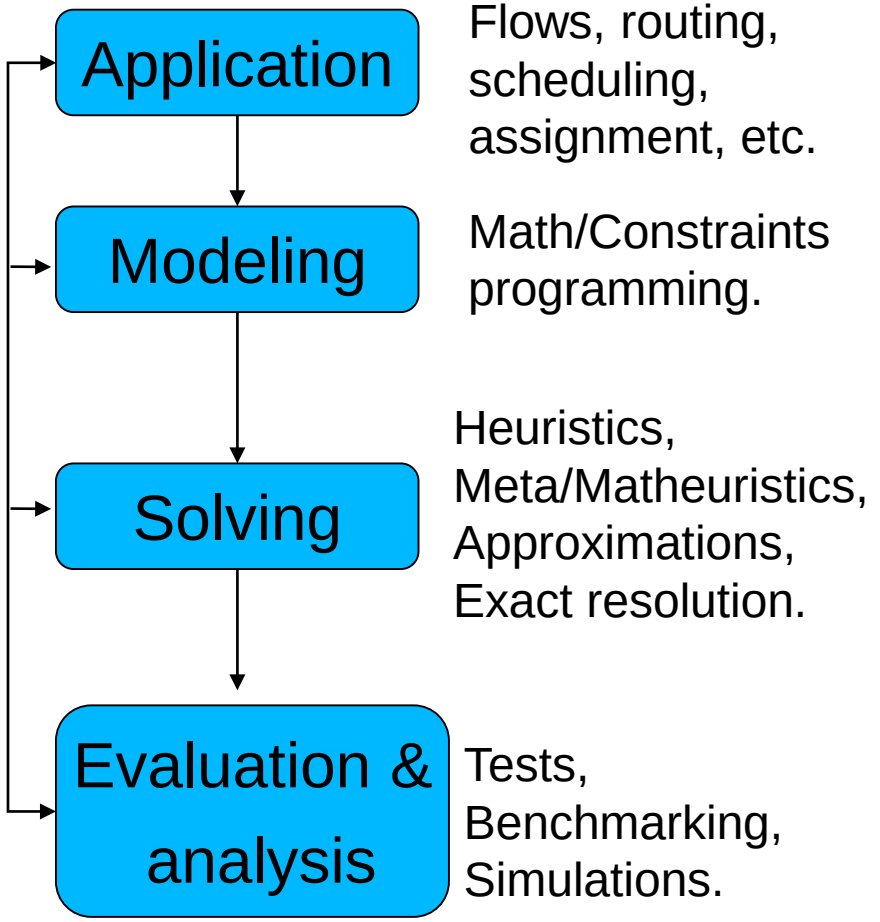
General methodology in Operations Research

OR is an interdisciplinary branch of **applied mathematics and formal science that uses advanced analytical methods** such as:

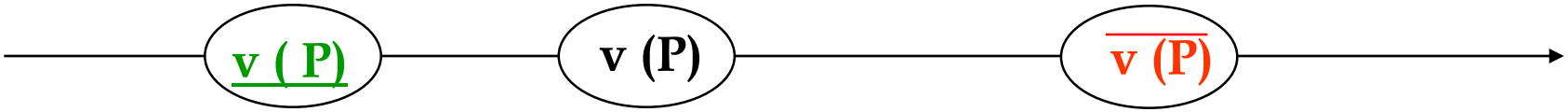
- Mathematical/logical modeling,
- statistical analysis and
- mathematical optimization

to arrive at optimal or near-optimal solutions to **complex decision-making problems**.



Solving methods and libraries

[Search range]



Exact methods
MP (CPLEX, Xpress, Gurobi, COIN, BOB++) or CP (Kalis, Choco, CP solver)

- Based on implicit enumeration of the solution set (Branch-and-X, DP, A*, D&C, …)
- Generic components (operators of search, generation, branching, lower bounding, cutting, pricing…)
- *Parallelism: node evaluation, tree traversal, searching range*

Matheuristics

Metaheuristics (LocalSolver, ParadisEO)

- Based on the solution set search methods (SA, TS, GA, …)
- Generic components (operators of search, selection, replacement, termination,…)
- *Parallelism: solution evaluation, neighborhood partitionning, cooperative searching*

Parallelism : faster/bigger/+robust/+efficient