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Hybridizing Metaheuristics:
The road to success in problem solving !?!

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Abstract:

Over the years we have seen a potpurri of ideas coming up under the umbrella of metaheuristics. Often a new idea or a new paradigm was claimed to be "the" idea by their inventors when others found them useless at first glance. However, once hybridized things began to "fly." Many researchers especially in population based metaheuristics have followed this trend: "Following the general trend of hybrid metaheuristics and diminishing boundaries between the different classes of metaheuristics, ..." In this presentation we highlight the notion of hybridizing metaheuristics by emphasizing simple and yet effective ideas. Of course this does not mean to simply use a certain method and marry it with local search. Instead we propose, for instance, to use a hybridization of reactive tabu search (RTS) and simulated annealing (SA) where the RTS may be viewed as an intensifying mechanism and SA is used for diversification.

Moreover, we sketch the use of the pilot method when hybridized with well-known metaheuristics such as, e.g., variable neigborhood search (VNS) and greedy randomized adaptive search procedure (GRASP). The pilot method as a metaheuristic is a tempered greedy method aimed at obtaining better solutions while avoiding the greedy trap by looking ahead for each possible choice. Repeatedly a master solution is modified; each time in a minimal fashion to account for best choices, where choices are judged by means of some heuristic measure (based on a separate heuristic result, the pilot solution).

– a certain non-standard multi-commodity flow formulation, with one commodity per customer, implies by projection certain 'hypotour-like' inequalities in the two-index space,

– the set partitioning formulation implies by projection both multistar and hypotour-like inequalities in the two-index space.