Landmarks, Critical Paths and Abstractions: What’s the Difference Anyway?

Abstract:
Current heuristic estimators for classical domain-independent planning are usually based on one of four ideas: delete relaxations, critical paths, abstractions, and, most recently, landmarks. Previously, these different ideas for deriving heuristic functions were largely unconnected.

We prove that admissible heuristics based on these ideas are in fact very closely related. Exploiting this relationship, we introduce a new admissible heuristic called the landmark cut heuristic, which compares favorably with the state of the art in terms of heuristic accuracy and overall performance.

Biography:
Malte Helmert is a lecturer at Albert-Ludwigs-Universität Freiburg, where he graduated with a diploma in computer science in 2001 and a Ph.D. in computer science in 2006. His main research area is classical domain-independent planning, with occasional forays into other areas where combinatorial search techniques can be applied, such as model checking. He served as organizer of the international planning competition in 2008 and is conference co-chair of the International Conference on Automated Planning and Scheduling (ICAPS 2011) in Freiburg. He is an associate editor of JAIR. He is the main author of seven publications that have been awarded with best paper awards or honorable mentions at various venues, including ECP, ICAPS, AAAI, and an honorable mention for the IJCAII-JAIR best paper prize.