

Figure 2: Comparing M-ARTUE vs. ARTUE

## 6. Conclusions and Future Work

While our experiments support our claim that domain-independent heuristics can, for some tasks and domains, replace hand-coded knowledge in goal formulation, much work remains to be done. First, it's important to identify the generality of these techniques in applications to other domains. Second, our experiments required tuning constants in the motivator functions (see Section 4.1). This use of domain-specific knowledge is undesirable and we plan to instead automatically tune them in our future work. Third, we intend to address the higher overhead of planning for all goals on every GDA cycle, possibly by filtering goals that can be identified *a priori* as non-contributory. Fourth, resources are presently identified as part of the domain description, but could be algorithmically discovered in future work. Finally, we plan to replace the Social Motivator with an interactive system that allows M-ARTUE to learn goal formulation knowledge, as discussed in prior work (Powell *et al.* 2011), to permit long-lived agents to adapt their formulation policies over time.

### Acknowledgements

Thanks to ONR 32 for their support of this research.

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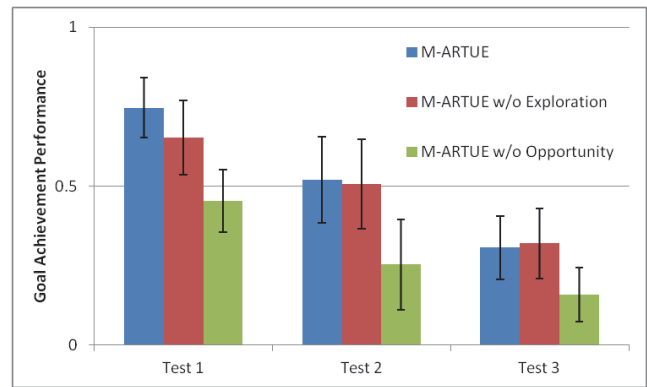


Figure 3: Comparing M-ARTUE vs. ablations

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