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**Organization:** Pace University New York Campus

### Review #2

**Proposal Number:** 0710790  
**Performing Organization:** Pace University  
**NSF Program:** Robust Intelligence  
**Principal Investigator:** Benjamin, David P  
**Proposal Title:** Cognitive Robot Schemas: Integrating Perception, Language and Planning in a Mobile Robot  
**Rating:** Good

### REVIEW:

What is the intellectual merit of the proposed activity?

The proposal is in the area of cognitive robotics. Its goal is to build an architecture for intelligent systems that unites perceiving, problem solving, and acting in the world (motor and language). This has been the Holy Grail of AI and we have a rich history of work in the field, some of which is referred to in this proposal. See list below for some others that should be included. The idea is to use Soar as a unifying framework. Motor schemas have already been integrated into Soar (via RT-Soar developed by the PI in prior work). Language will be integrated using NL-Soar developed by a collaborator (not part of this proposal). How perception will be integrated is not entirely clear. A virtual world physics-based simulator is used as a world model. The proposed evaluation of this architecture is with distributed (simulated) mobile robots solving problems involving shepherding. The novelty of the work is not clearly articulated. The theoretical aspects are not fully fleshed out -- the individual parts are explained, but how they will be integrated is far from clear. The evaluation plan is weak.

See the work of Holly Yanco and Lynn Stein at MIT (<http://www.ai.mit.edu/projects/cognitive-robotics/asrl.html>), Jeff Siskind at Purdue (<http://cobweb.ecn.purdue.edu/~qobi/papers.html>) especially his work on grounding language in perception, and John Laird's work on games (<http://ai.eecs.umich.edu/people/laird/gamesresearch.html>) (Laird has successfully built a SOAR-based architecture for playing Quake which appears to involve a more complex world than what it proposed here). SOAR-based architectures have also been used for tactical air simulation (Milind Tambe at USC).

What are the broader impacts of the proposed activity?

Given the concerns expressed above, its impact is difficult to judge.

Summary Statement

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