



The Scientific Community Game

Education and Innovation Through Survival in a Virtual World of Claims

Karl Lieberherr, Ahmed Abdelmeged, Yue Liu
 Northeastern University
 College of Computer and Information Science

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The Scientific Community Game (SCG) is in the spirit of Karl Popper who is one of the prominent philosophers of science of the 20th century. The SCG involves proposing and opposing claims related to a constructive domain (e.g., STEM domains in computer science, mathematics, engineering, etc.). Central to opposing claims is refuting claims based on a refutation protocol. When playing the game, scholars make constructive claims about the domain and oppose others' claims. The scholars who are the most successful in defending and opposing claims win the game and gain a high reputation in the community.

The main benefits of the game are:

- 1) The scholars give each other constructive feedback about their claims. Scholars who lose points gain knowledge to improve their game in the future.
- 2) When scholars try to maximize their reputation points and win the game, they create a common good: knowledge. The claims that have not been successfully opposed are candidates for truth which benefit the social welfare.
- 3) The competition and collaboration are well structured and effective. The scholars will have a consistent interface for all problems and a community for comparing various solution approaches fairly.
- 4) The game is fun and adjusts to the skill levels of scholars.

The SCG can be played productively for

- 1) Developing reliable software for computational problems.
- 2) Evaluating potential employees.
- 3) Developing new knowledge in the given domain.
- 4) Evaluating algorithmic innovations fairly.
- 5) Teaching software development / problem solving techniques in a fun game environment.

CONTACT

Karl Lieberherr

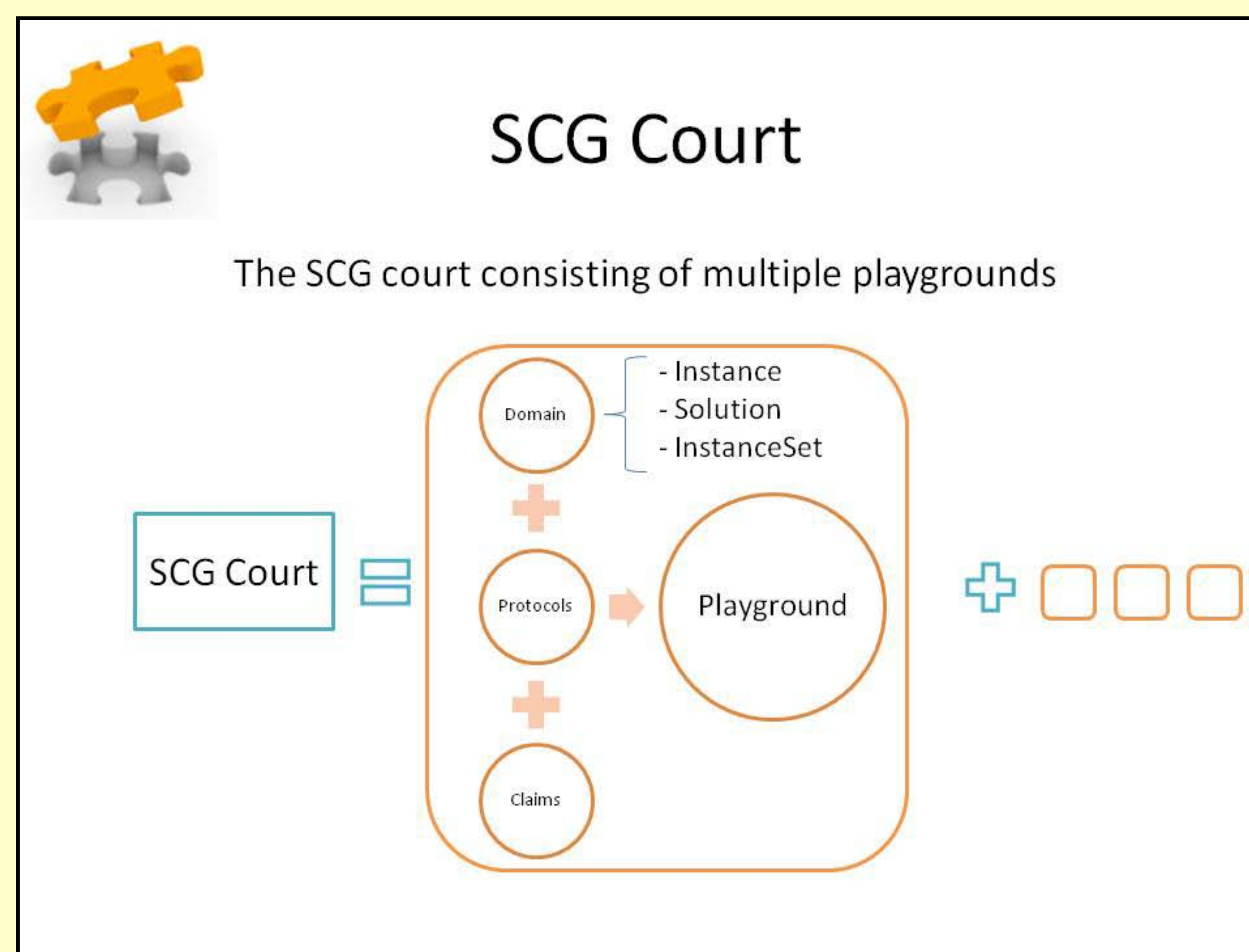
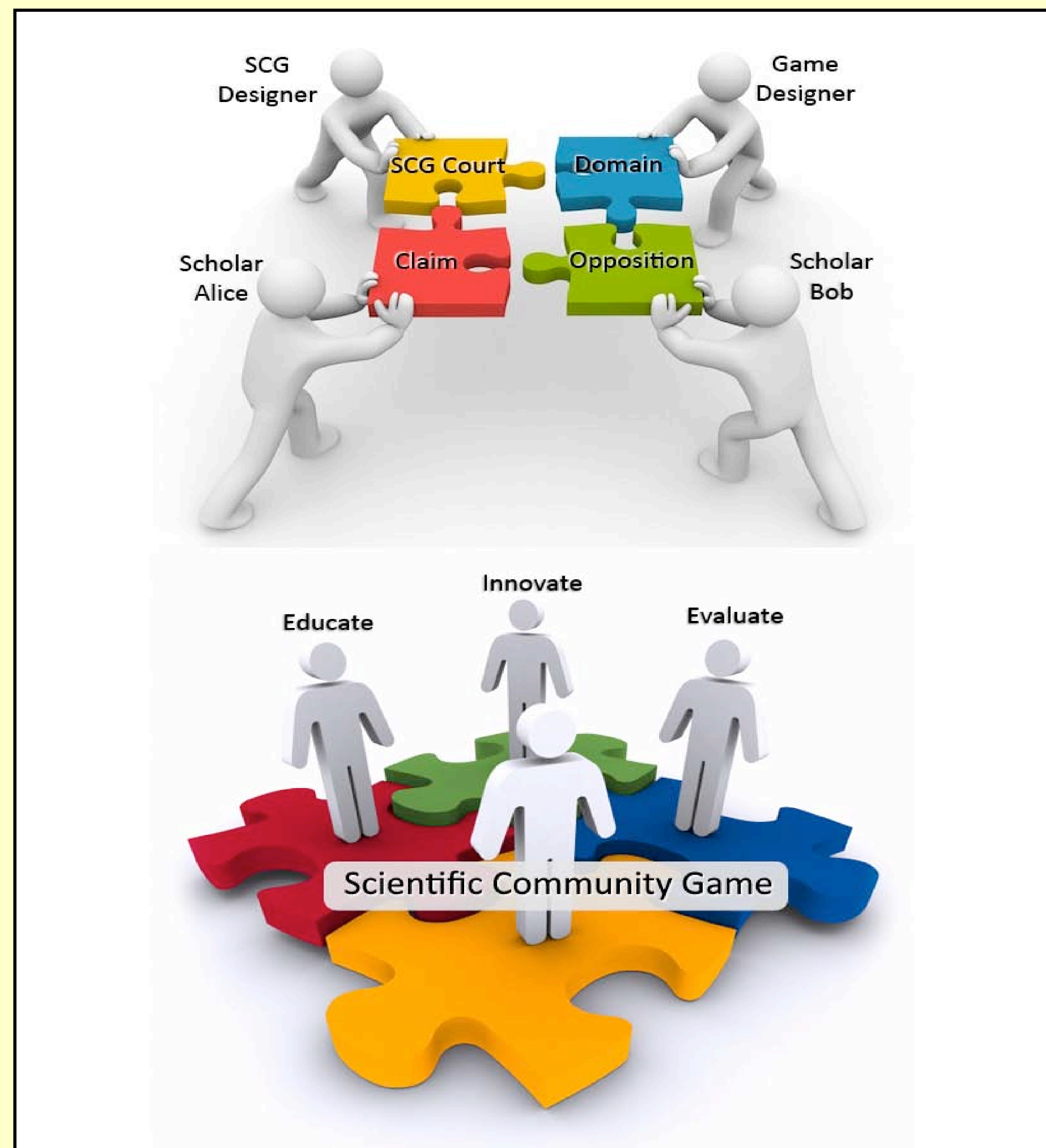
College of Computer and Information Science

Email: lieber@ccs.neu.edu

Phone: 617-373-2077

Website: <http://www.ccs.neu.edu/home/lieber>

INTRODUCTION

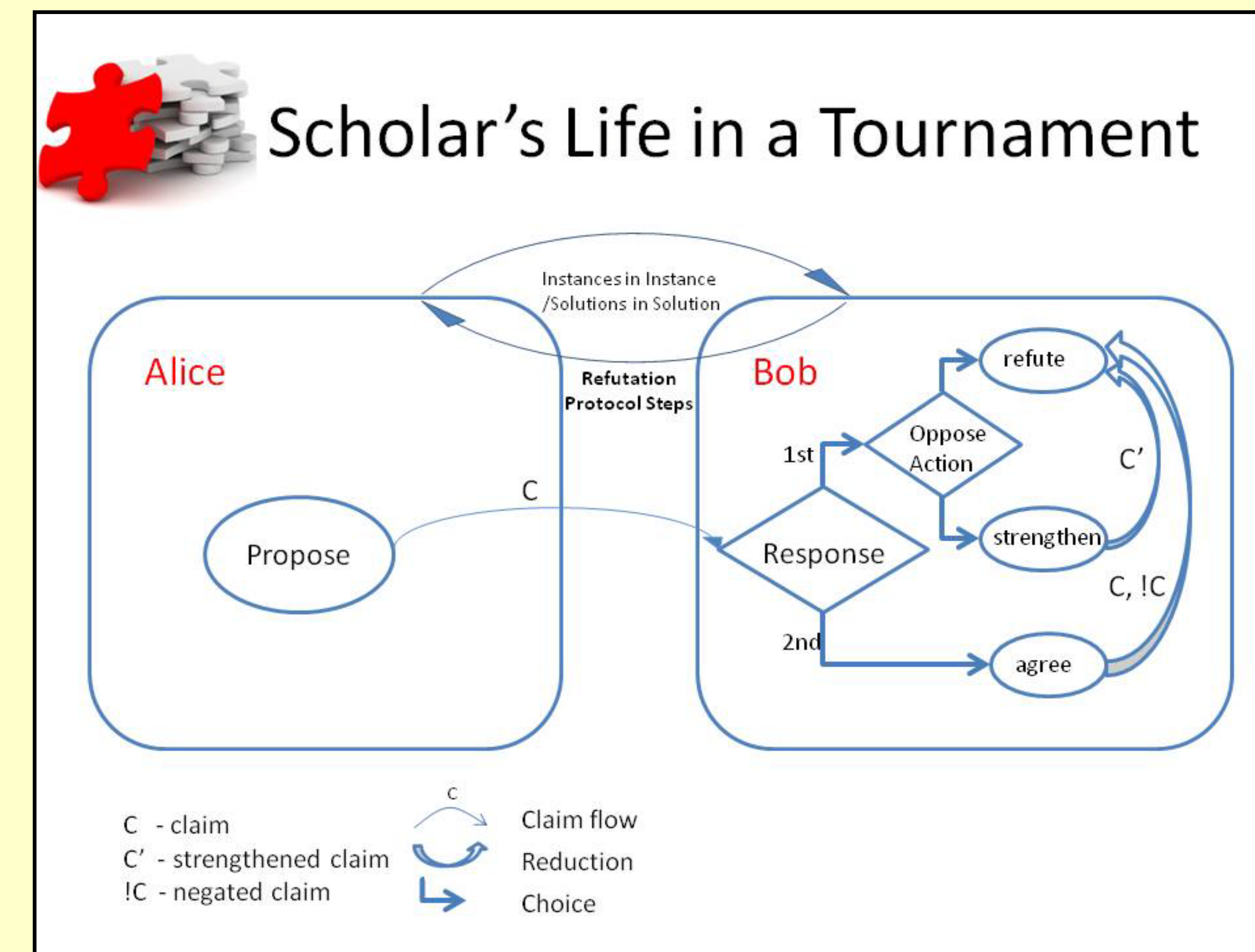


APPLICATIONS

- Software Development for Computational Problems
- Algorithm Design
- Mathematical Problem Solving
- Experiential Learning

Examples of Instance/Solution

Instance	Solution
Raw Materials	Product
Algorithm	Input
Number	Graph
Network	Flow
Expression	Assignment
Number	Number
Graph	Path
Numbers	Decision Tree
Terrain	Trajectory



Model a Scientific Community

- Rules encourage productive scientific behavior
- Based on Claims and Refutations
 - Claims
 - Instance Set
 - Protocol
 - Quality
 - Confidence
 - Refutations
 - Defining scientific discourse
 - Using a refutation protocol

Return On Investment for playground designers: a small investment in defining a domain, etc. produces an interactive environment to assimilate and create domain knowledge.

Return on Investment for scholars and avatar designers: The SCG rules need to be learned only once because they are the same across playgrounds. A small investment in learning a domain etc. leads to numerous learning and teaching opportunities. The more a scholar teaches, the higher the scholar's reputation.

FUTURE WORK

- Web Application for Crowd Sourcing and Education.
- On-line definition of playgrounds to be used by managers and professors.
- Providing a library of predefined domains, protocols, claims and playgrounds.
- Related Work: Generalizing and Improving TopCoder

REFERENCE

The Specker Challenge Game for Education and Innovation in Constructive Domains, with Ahmed Abdelmeged and Bryan Chadwick, Keynote talk and paper at Bionetics 2010 Cambridge, December 2010, Springer Verlag.