The Specker Challenge
Game

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SCG Overview

• Two players take turns:
  • Proposing / Strengthening claims about a specific domain.
  • Refuting / Supporting claims through a refutation protocol.
• Refutation protocols involve the exchange of problems and solutions.
SCG for Software Development

- Software development process for optimization problems.
  - Project leader defines:
    - Language for writing claims, problems, and solutions.
    - Quality of solutions.
  - Teams develop their avatars.
  - Nightly builds involve a contest between avatars.
Benefits of Structured Communication

- History can be used to figure out:
  - Avatar strengths/weaknesses.
  - Avatar sophistication.
  - Hard problems in the domain.
  - How serious are the contests.
  - Probably other information.
<table>
<thead>
<tr>
<th>id</th>
<th>offerer</th>
<th>acceptor</th>
<th>pred</th>
<th>price</th>
<th>quality</th>
<th>secretQuality</th>
<th>profit(offerer)</th>
</tr>
</thead>
<tbody>
<tr>
<td>500</td>
<td>Lightning</td>
<td>Athena</td>
<td>(0)</td>
<td>1.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>505</td>
<td>Athena</td>
<td>Lightning</td>
<td>(12)</td>
<td>1.0</td>
<td>0.269</td>
<td>0.269</td>
<td>-0.538</td>
</tr>
</tbody>
</table>

```javascript
(101 -> playerspec("Athena" "129.10.116.169" 8080))
(100 -> playerspec("Lightning" "129.10.116.124" 9000))

round[1]
playertrans[
  100
    offer[503 all (57 67 73 117 126 ) 0.8136923076923077]
    offer[502 all (17 126 ) 0.8136923076923077]
    offer[501 all (81 103 109 126 ) 0.8136923076923077]
    offer[500 secret (0 ) 1.0]
]
playertrans[
  101
    offer[505 secret (12 ) 1.0]
    offer[504 all (94 ) 0.69031469]
    accept[500]
]
[acceptor paid 1.0 for challenge 500. acceptor: 101 offerer: 100 ]
]
round[2]
playertrans[
  100
    offer[509 all (86 99 109 120 ) 0.5887505827505828]
    offer[508 all (15 33 54 108 ) 0.5887505827505828]
    offer[507 all (31 73 81 118 ) 0.6913146853146853]
    offer[506 secret (0 ) 1.0]
    accept[505]
    provide[v0 v1 v2 v3 v4 (0 {1} v0 v1 v2 ) (0 {1} v0 v1 v3 ) (0 {1} v1 v2 v4 ) (0 {1} v1 v3 v4 ) [ ] 500]
]
[acceptor paid 1.0 for challenge 505. acceptor: 100 offerer: 101 ]
```
Contest Benefits

• Makes the process *fun* as there is a *chance* of winning either the contest or the feedback.

• Motivates teams to analyze the domain and develop evolvable avatars.

• Can be used for team evaluations.
SCG Avatar

• Four components:
  • Challenger: challenge existing claims.
  • Offerer: propose new claims.
  • Provider: provide problems in support of claims.
  • Solver: solve problems in defense of claims.
SCG Avatar

- Challenger: limits of the provider.
- Proposer: limits of the solver.
- Provider: cross testing of solvers.
- Solver: desired project outcome.
Web Admin

- Avatar registration.
- Results.

Tournament Complete
Final Table

<table>
<thead>
<tr>
<th>Rank</th>
<th>Name</th>
<th>Points</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Lightning</td>
<td>56</td>
</tr>
<tr>
<td>2</td>
<td>EasternWind</td>
<td>50</td>
</tr>
<tr>
<td>3</td>
<td>Athena</td>
<td>48</td>
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<tr>
<td>4</td>
<td>Peon</td>
<td>45</td>
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<tr>
<td>5</td>
<td>Jack Bauer</td>
<td>24</td>
</tr>
<tr>
<td>6</td>
<td>sweet</td>
<td>23</td>
</tr>
<tr>
<td>7</td>
<td>BasicPlayer2</td>
<td>22</td>
</tr>
<tr>
<td>8</td>
<td>Black and Gold</td>
<td>20</td>
</tr>
<tr>
<td>9</td>
<td>BasicPlayer</td>
<td>16</td>
</tr>
<tr>
<td>10</td>
<td>Nercide</td>
<td>14</td>
</tr>
<tr>
<td>11</td>
<td>Stepdad</td>
<td>0</td>
</tr>
</tbody>
</table>