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| **Title:** Soccer League Competition Algorithm  **Main author:** Naser Moosavian  **Year:** 2013-2014  **Link:** (<http://www.scirp.org/journal/ijis>)  <http://dx.doi.org/10.4326/ijis.2014.41002>  studied by : Muhammad Mohsin 15140104 |
| **Journal:** International Journal of Intelligence Sciences  **IF:** 3.198  **Pages:** 10 |
| **Structure of the paper**   1. Abstract 2. Introduction  * Literature Review  1. Soccer League Competitions  * Soccer League Competition Algorithm  1. **Imitation Factor** 2. **Provocation Operator** 3. **Mutation Operator** 4. **Substitution Operator**  * Steps and Flow Chart  1. **Initialize problems and parameters** 2. **Generate Samples** 3. **Teams Assessment** 4. **Start the League** 5. **Relegation and promotion** 6. **Check the Stopping Criteria** 7. Numerical results    * Exploitation Operator    * Exploration Operator    * Operator for avoiding local minima    * Convergence behavior of the algorithm    * Condition added only for complex problems 8. **Kick out last 2 worst teams of the league and bring new ones** 9. SLC Solving  * **Non-linear equations**  1. Conclusion 2. References |
| **Detail of figures**  **Regarding inspiration**   1. Soccer League competition: Explains how Soccer competitions are arranged and teams compete to top the table at the end of the season. 2. Behavior of the league matches and affect on the players after winning and losing the match. 3. Team fitness and population values.   **Explanation of the inspiration**   1. Updating parameters of players after each match 2. Winning team operators and losing team operators for updating fitness 3. Pseudo code of the algorithm 4. Finding best values for the variables of equations using case studies for best result.   **Case studies to non-linear equations:**   1. **Case Study: -1**  * Finding best values of parameters of SLC for best results for the equations given * Comparing the algorithm with PSO, PPSO, DE * Comparing the algorithm with PPSO, Mo el al, Luo et al  1. **Case Study: -2**  * Finding best values of parameters of SLC for best results for the equations given * Comparing the algorithm with PSO, PPSO, DE * Comparing the algorithm with PPSO, Mo el al, Luo et al  1. **Case study: -3**  * Finding best values of the parameters of SLC for best results for the equations. * Comparing the algorithm with PSO, PPSO, DE * Comparing the algorithm with PPSO, Mo el al, Luo et al |
| **Experimental setup and experimentation**   * **Case Study -1:** Find best values of X1, X2 display result on table. * **Run Algorithm on problem: Geometry size of thin wall rectangle grinder section equations**   + **Compared results with:** PSO, DE, PPSO, Mo et al, Luo et al   + **Outputs:** Best worst, mean, std, FCN   + **Output structure:** Tabular      * **Case Study -2:** Find best values of X1, X2 display result on table. (best population size and variable value from case study 1). * **Run Algorithm on problem (equation Given In paper)**   + **Compared results with:** PSO, DE, PPSO, Mo et al, Luo et al   + **Outputs:** Best worst, mean, std, FCN   + **Output structure:** Tabular * **Case Study -3:** Find best values of X1, X2 display result on table. (best population size and variable value from case study 1). * **Run Algorithm on problem (equation Given In paper)**   + **Compared results with:** PSO, DE, PPSO, Mo et al, Luo et al   + **Outputs:** Best worst, mean, std, FCN   + **Output structure:** Tabular |
| **A brief summary of the proposed work [one paragraph]**  Soccer League Algorithm, an algorithm inspired by the optimization of football league competitions. All teams play 2 matches with other respective team. Total matches depend upon the total number of teams competing in the tournament by (M\*(M-1))/2 (where M is the total no of teams). Each team wants to top the table at the end of each iteration. Teams which consists high performed or high fitness players has more probability to win matches against opponent teams. The team fitness is calculated by the average total fitness of the players. Each team has 11 fixed players and 11 substitute players. Every team has a SP (Star Player) and the tournament has an SSP (super star player) which has best fitness among team and best fitness among the whole tournament players respectively. The winning and losing team applying different strategies to perform better in next matches. Winning team fixed players try to imitate SP (star player) of the team and SSP (super star player) of the team. Substitutes of the winning team tries to improve their performance by making their fitness at least at the average of fixed players of the team. On the other hand, fixed players of losing team tries to improve their performance by changing position of players. The losing team substitutes pairs are being entered by a certain probability to make winning probability chances. At the end of the tournament, best teams buy players with best fitness and average and weak players are bought by weak team. SSP is the optimal and SP is the local optima of the solution. |
| **Critical review:**  In the population, the mapping gives the best values when the total teams in a competition are 3-5, normally teams in a tournament are above 10. In the idea, teams buy players in mid and end season which is only properly mapped. Other than that, SP and SSP players also follows the legend players which are completed so their convergence can also be mapped. In a tournament, a player can retire or changes league which maybe considered a legend in the league according the stats. So SSP, SP players can also coverage at them. |
| **Any idea to upgrade the concept**  Two things can be updated in the concepts:  **1.UEFA Champion League addition:**  Top 4 teams in Top 5 Europe league teams qualify for the UCL (UEFA Champions League) competition every season to determine the best team in Europe. Algorithm can also be run by 4-5 league in which top 4 teams qualify and then same idea is proposed of winning and losing and can be determined the best team in Europe. Through this, teams of best fitness compete within a season to get more accurate results.  **2.SP and SSP follows Legend of the league:**  After each season, A player can become a league best player by performing best according to his position in the team (attacker, defender, mid-fielder). An idea can be added that SP and SSP of the teams and league can imitate the legend player of the league so the optimal best can reach more accurately than the proposed idea. The results of the players can be stored and then the SSP coverages towards the player. |
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