

Fantasy Football Optimization Report

An Evolutionary & Swarm Intelligence Approach

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University of Example - Advanced Optimization Course

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This index provides a quick guide through the main sections of the report. Page numbers are not explicitly shown, but each section title is clear.

1. Technical Overview & Scoring

This project combines PSO, DE, and ES to solve a multi-manager fantasy football optimization. Each manager chooses one approach and aims to maximize the total performance score of selected players under budget and positional constraints.

Scoring Function (score_player):

Rewards goals, assists, and bonus metrics, while penalizing negative events such as cards. A final fantasy rating may also contribute. The team's objective is the sum of these scores.

Auction & Forced Assignments:

Managers bid in parallel. If conflicts arise, a resolution decides who wins. If a manager fails to fulfill minimum role requirements or runs low on budget, forced assignments ensure a valid roster, but may not be optimal.

2. Empirical Performance Analysis

Performance by Strategy:

Strategy	Managers	Avg Total Score	Avg Team Score
PSO	4	49.40	2.95
DE	4	51.76	2.92
ES	4	44.85	2.65

Figure 1: Average Team Score by Strategy

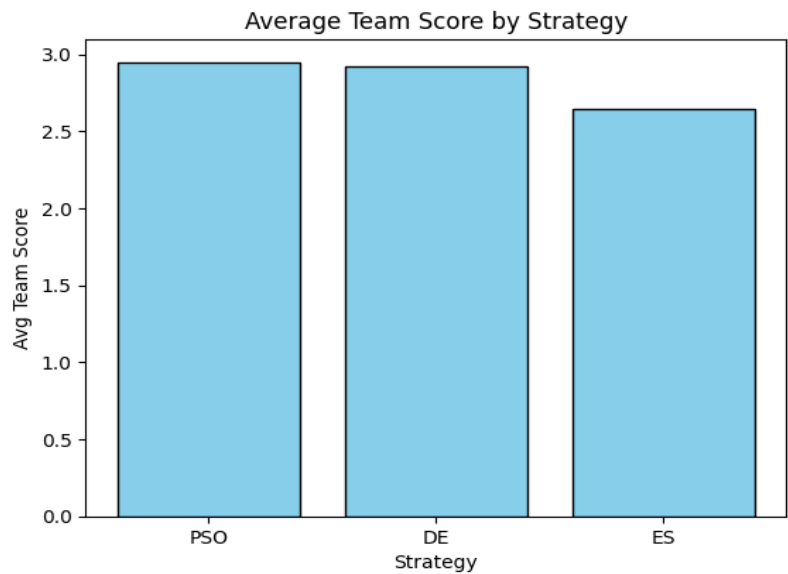


Figure 2: Manager Distribution by Strategy

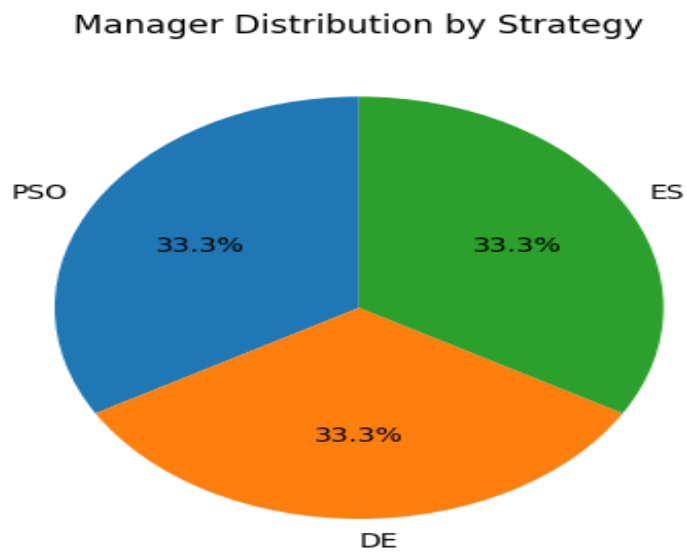
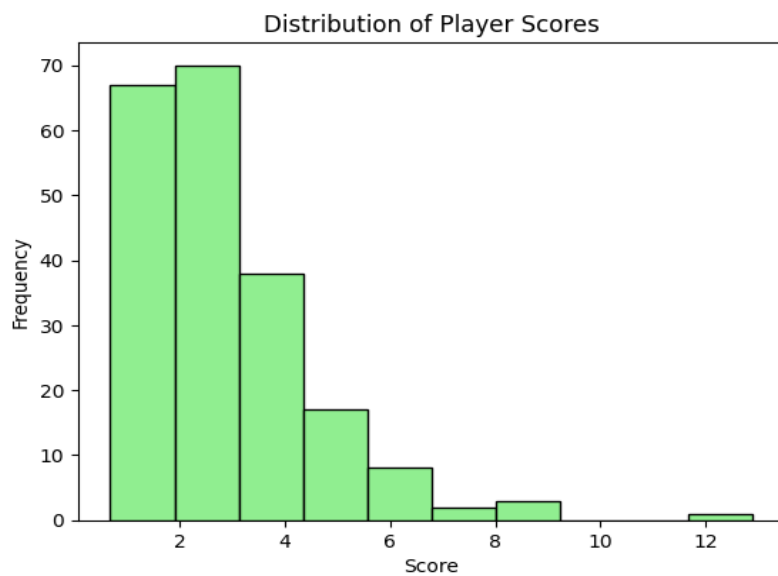


Figure 3: Distribution of Player Scores



Player Score Summary:

- Best: 12.90
- Worst: 0.68
- Average: 2.84

3. Forced Assignments & Budget Usage

Figure 4: Forced Assignments per Manager

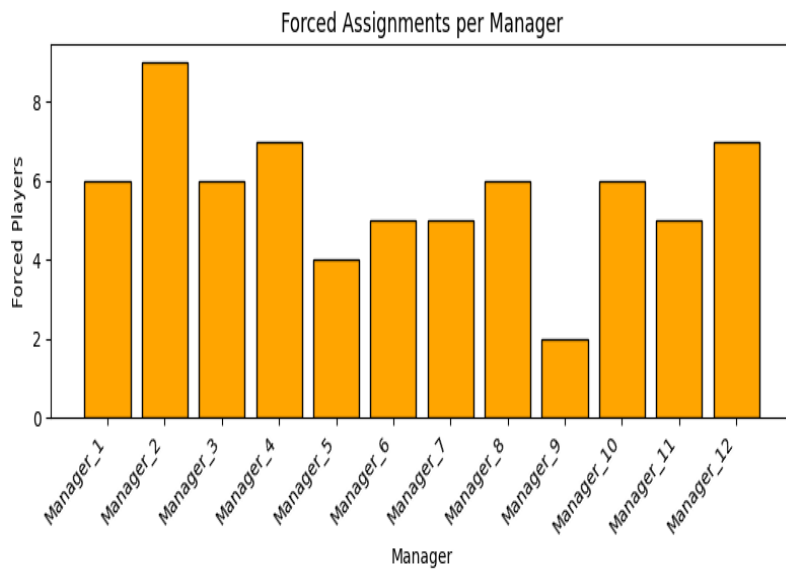
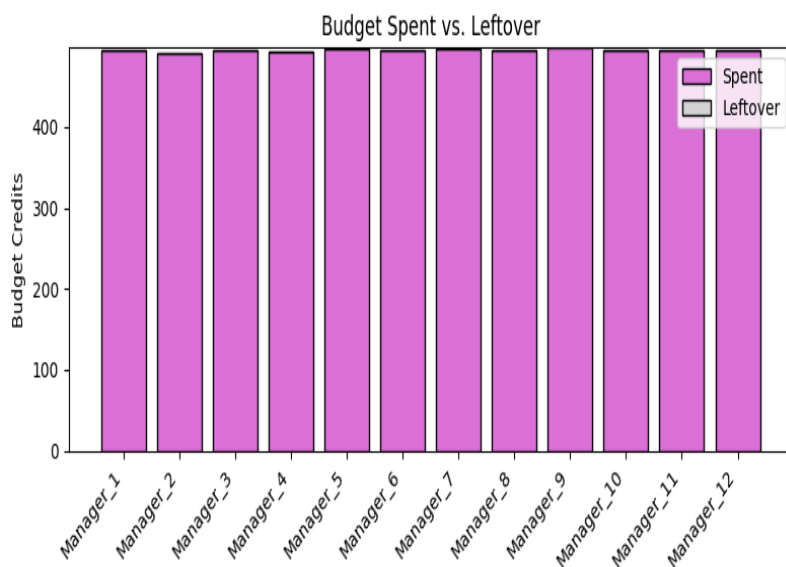


Figure 5: Budget Spent vs. Leftover



Recap Table: Manager Stats

Manager	Strat	Forced	Spent	Leftover	Objective
Manager_1	PSO	6	494.0	0.0	52.91
Manager_2	DE	9	492.0	0.0	51.48
Manager_3	PSO	6	494.0	0.0	44.46
Manager_4	DE	7	493.0	0.0	53.64
Manager_5	ES	4	496.0	0.0	49.18
Manager_6	ES	5	495.0	0.0	46.02

Manager_7	PSO	5	496.0	0.0	47.00
Manager_8	DE	6	494.0	0.0	55.32
Manager_9	ES	2	498.0	0.0	44.23
Manager_10	DE	6	494.0	0.0	46.59
Manager_11	ES	5	495.0	0.0	39.99
Manager_12	PSO	7	494.0	0.0	53.23

4. Final Teams

The best manager overall is Manager_8 with a total score of 55.32.

Manager_1 (PSO)

- Lookman (A), Price: 60.0, Score: 8.35
- Tengstedt (A), Price: 59.0, Score: 4.48
- Zortea (D), Price: 47.0, Score: 3.72
- Bonny (A), Price: 67.0, Score: 4.11
- Saelemaekers (C), Price: 35.0, Score: 4.18
- Calhanoglu (C), Price: 57.0, Score: 3.83
- Ekkelenkamp (C), Price: 47.0, Score: 3.16
- Tete Morente (C), Price: 51.0, Score: 2.85
- Isaksen (A), Price: 53.0, Score: 2.78
- Chukwueze (C), Price: 9.0, Score: 2.28
- Dallinga (A), Price: 3.0, Score: 2.24
- Milinkovic-Savic V. (P), Price: 1.0, Score: 1.84
- Meret (P), Price: 1.0, Score: 1.32
- De Gea (P), Price: 1.0, Score: 1.52
- Cambiaso (D), Price: 1.0, Score: 2.07
- De Vrij (D), Price: 1.0, Score: 2.23
- Vogliacco (D), Price: 1.0, Score: 1.96

Manager_2 (DE)

- Pinamonti (A), Price: 45.0, Score: 5.42
- Dovbyk (A), Price: 67.0, Score: 5.84
- Zambo Anguissa (C), Price: 66.0, Score: 4.32
- Leao (A), Price: 58.0, Score: 4.80
- Odgaard (A), Price: 53.0, Score: 3.51
- Marin (C), Price: 61.0, Score: 3.01
- Hernani (C), Price: 44.0, Score: 2.82
- Mbangula (A), Price: 42.0, Score: 3.30
- Strefezza (C), Price: 47.0, Score: 3.28
- Leali (P), Price: 1.0, Score: 1.20
- Sommer (P), Price: 1.0, Score: 1.26
- Di Gregorio (P), Price: 1.0, Score: 1.06
- Tchatchoua (D), Price: 1.0, Score: 2.24
- Holm (D), Price: 1.0, Score: 1.80
- Buongiorno (D), Price: 1.0, Score: 1.75
- Gatti (D), Price: 1.0, Score: 1.65
- Mancini (D), Price: 1.0, Score: 1.75
- Zielinski (C), Price: 1.0, Score: 2.49

Manager_3 (PSO)

- Krstovic (A), Price: 52.0, Score: 5.35
- Dybala (A), Price: 41.0, Score: 5.01
- Kolo Muani (A), Price: 58.0, Score: 4.74
- Yildiz (A), Price: 35.0, Score: 3.78
- Sohm (C), Price: 64.0, Score: 3.09
- Conceicao (C), Price: 57.0, Score: 3.19
- Dominguez B. (A), Price: 44.0, Score: 3.20
- Neres (C), Price: 52.0, Score: 3.28
- Valeri (D), Price: 47.0, Score: 2.65
- Valenti (D), Price: 38.0, Score: 1.66

- Maignan (P), Price: 1.0, Score: 1.19
- Carnesecchi (P), Price: 1.0, Score: 0.99
- Caprile (P), Price: 1.0, Score: 1.11
- Luperto (D), Price: 1.0, Score: 2.03
- Sverko (D), Price: 1.0, Score: 1.53
- Palomino (D), Price: 1.0, Score: 1.66

Manager_4 (DE)

- Lucca (A), Price: 43.0, Score: 6.04
- Castellanos (A), Price: 46.0, Score: 6.24
- Dia (A), Price: 70.0, Score: 5.64
- Pulisic (C), Price: 43.0, Score: 5.48
- Angelino (D), Price: 63.0, Score: 2.43
- Thuram K. (C), Price: 42.0, Score: 3.05
- Pasalic (C), Price: 47.0, Score: 2.57
- Zaniolo (C), Price: 42.0, Score: 2.29
- Oristanio (C), Price: 60.0, Score: 2.73
- Raspadori (A), Price: 19.0, Score: 2.83
- Cacace (D), Price: 10.0, Score: 2.42
- Haj Mohamed (A), Price: 1.0, Score: 1.59
- Svilar (P), Price: 1.0, Score: 0.97
- Stankovic F. (P), Price: 1.0, Score: 1.20
- Skorupski (P), Price: 1.0, Score: 1.16
- Leoni (D), Price: 1.0, Score: 1.56
- Gila (D), Price: 1.0, Score: 1.45
- Gabbia (D), Price: 1.0, Score: 1.60
- Ellertsson (C), Price: 1.0, Score: 2.40

Manager_5 (ES)

- Retegui (A), Price: 78.0, Score: 12.90
- Morata (A), Price: 40.0, Score: 3.63
- Di Lorenzo (D), Price: 51.0, Score: 2.80
- Cataldi (C), Price: 51.0, Score: 2.75
- El Shaarawy (C), Price: 54.0, Score: 3.38
- Kyriakopoulos (D), Price: 58.0, Score: 2.64
- Gyasi (C), Price: 49.0, Score: 2.20
- Gineitis (C), Price: 46.0, Score: 2.44
- Kone' M. (C), Price: 52.0, Score: 2.25
- Hernandez T. (D), Price: 9.0, Score: 2.95
- Coman F. (A), Price: 2.0, Score: 1.92
- Arnautovic (A), Price: 1.0, Score: 1.98
- Gabrielloni (A), Price: 1.0, Score: 2.22
- Turati (P), Price: 1.0, Score: 1.34
- Falcone (P), Price: 1.0, Score: 1.11
- Vasquez D. (P), Price: 1.0, Score: 1.05
- Kalulu (D), Price: 1.0, Score: 1.65

Manager_6 (ES)

- Vlahovic (A), Price: 32.0, Score: 6.08
- Zaccagni (C), Price: 60.0, Score: 5.84
- Orsolini (C), Price: 59.0, Score: 5.66
- Mosquera (A), Price: 56.0, Score: 3.40
- Adli (C), Price: 51.0, Score: 3.50
- Dele-Bashiru (C), Price: 65.0, Score: 2.87
- Carlos Augusto (D), Price: 53.0, Score: 2.72

- Noslin (A), Price: 52.0, Score: 2.62
- Darmian (D), Price: 44.0, Score: 2.58
- Sarr A. (A), Price: 13.0, Score: 2.79
- Brenner (A), Price: 5.0, Score: 2.25
- Sava (P), Price: 1.0, Score: 0.88
- Provedel (P), Price: 1.0, Score: 0.92
- Suzuki (P), Price: 1.0, Score: 0.80
- Coppola D. (D), Price: 1.0, Score: 1.38
- Birindelli (D), Price: 1.0, Score: 1.73

Manager_7 (PSO)

- Thuram (A), Price: 43.0, Score: 8.88
- Esposito Se. (A), Price: 44.0, Score: 5.40
- Mota (A), Price: 33.0, Score: 3.19
- Delprato (D), Price: 75.0, Score: 3.03
- Barella (C), Price: 45.0, Score: 3.74
- De Roon (C), Price: 44.0, Score: 3.15
- Marusic (D), Price: 65.0, Score: 2.71
- Pellegri (A), Price: 46.0, Score: 2.74
- Gigot (D), Price: 42.0, Score: 2.34
- Frendrup (C), Price: 44.0, Score: 2.10
- Ilic (C), Price: 9.0, Score: 1.59
- Lambourde (A), Price: 1.0, Score: 2.00
- Reina (P), Price: 1.0, Score: 0.96
- Ravaglia F. (P), Price: 1.0, Score: 0.98
- Perin (P), Price: 1.0, Score: 1.10
- De Sciglio (D), Price: 1.0, Score: 1.72
- Giannetti L. (D), Price: 1.0, Score: 1.38

Manager_8 (DE) <-- Top Performer

- Martinez L. (A), Price: 73.0, Score: 7.12
- Reijnders (C), Price: 66.0, Score: 5.67
- Adams C. (A), Price: 46.0, Score: 5.41
- Thauvin (A), Price: 54.0, Score: 4.99
- Piccoli (A), Price: 36.0, Score: 4.17
- McTominay (C), Price: 54.0, Score: 4.48
- Paz N. (C), Price: 40.0, Score: 5.03
- Gudmundsson A. (A), Price: 50.0, Score: 3.34
- Zappacosta (D), Price: 47.0, Score: 3.18
- Fabbian (C), Price: 11.0, Score: 2.19
- Coco (D), Price: 11.0, Score: 1.76
- Okoye (P), Price: 1.0, Score: 0.83
- Montipò (P), Price: 1.0, Score: 0.81
- Butez (P), Price: 1.0, Score: 0.96
- Masina (D), Price: 1.0, Score: 2.09
- Martinez Quarta (D), Price: 1.0, Score: 1.69
- Biraghi (D), Price: 1.0, Score: 1.61

Manager_9 (ES)

- Dumfries (D), Price: 46.0, Score: 4.40
- Ndoye (C), Price: 43.0, Score: 4.23
- Nicolussi Caviglia (C), Price: 54.0, Score: 3.43
- Cristante (C), Price: 50.0, Score: 2.44
- Serdar (C), Price: 45.0, Score: 1.68
- Patric (D), Price: 39.0, Score: 1.58

- Svoboda (D), Price: 48.0, Score: 1.62
- Rrahmani (D), Price: 40.0, Score: 1.83
- Mkhitarian (C), Price: 52.0, Score: 2.42
- Kabasele (D), Price: 46.0, Score: 1.68
- Pobega (C), Price: 14.0, Score: 2.07
- Politano (C), Price: 12.0, Score: 2.58
- Soule' (A), Price: 2.0, Score: 2.42
- Gimenez (A), Price: 2.0, Score: 2.50
- Caprari (A), Price: 1.0, Score: 2.31
- Shomurodov (A), Price: 1.0, Score: 2.56
- Belotti (A), Price: 1.0, Score: 2.23
- Radu I. (P), Price: 1.0, Score: 1.07
- Musso (P), Price: 1.0, Score: 1.20

Manager_10 (DE)

- Pohjanpalo (A), Price: 43.0, Score: 4.31
- Weah (C), Price: 78.0, Score: 4.05
- Colombo (A), Price: 40.0, Score: 4.13
- Pedro (A), Price: 41.0, Score: 3.78
- Frattesi (C), Price: 69.0, Score: 3.54
- Beltran L. (A), Price: 55.0, Score: 4.05
- Man (C), Price: 56.0, Score: 4.15
- Ederson D.s. (C), Price: 46.0, Score: 3.07
- Savona (D), Price: 39.0, Score: 2.08
- Djuric (A), Price: 10.0, Score: 3.35
- Zappa (D), Price: 11.0, Score: 2.03
- Martinez Jo. (P), Price: 1.0, Score: 1.30
- Scuffet (P), Price: 1.0, Score: 0.82
- Sherri (P), Price: 1.0, Score: 0.87
- De Silvestri (D), Price: 1.0, Score: 1.70
- Maripan (D), Price: 1.0, Score: 1.62
- Bijol (D), Price: 1.0, Score: 1.76

Manager_11 (ES)

- Castro S. (A), Price: 59.0, Score: 4.98
- Kvaratskhelia (A), Price: 68.0, Score: 4.50
- Pierotti (A), Price: 68.0, Score: 3.28
- Diao (C), Price: 49.0, Score: 3.51
- Brescianini (C), Price: 55.0, Score: 3.21
- Maldini (C), Price: 37.0, Score: 2.51
- Zapata D. (A), Price: 48.0, Score: 3.01
- Gosens (D), Price: 74.0, Score: 2.42
- Cancellieri (A), Price: 15.0, Score: 2.52
- Zerbin (C), Price: 11.0, Score: 1.82
- Sazonov (D), Price: 6.0, Score: 1.00
- Mandas (P), Price: 1.0, Score: 1.30
- Rui Patricio (P), Price: 1.0, Score: 1.15
- Audero (P), Price: 1.0, Score: 0.75
- Kamara H. (D), Price: 1.0, Score: 2.03
- Zemura (D), Price: 1.0, Score: 2.01

Manager_12 (PSO)

- Kean (A), Price: 79.0, Score: 9.06
- Lukaku (A), Price: 50.0, Score: 7.14
- Cutrone (A), Price: 66.0, Score: 4.90

- De Ketelaere (A), Price: 45.0, Score: 4.45
- Vlasic (C), Price: 61.0, Score: 3.22
- Dorgu (D), Price: 39.0, Score: 2.72
- De Winter (D), Price: 47.0, Score: 2.50
- Dimarco (D), Price: 53.0, Score: 3.36
- Colpani (C), Price: 44.0, Score: 2.16
- Rocha Livramento (A), Price: 3.0, Score: 1.73
- Terracciano (P), Price: 1.0, Score: 1.03
- Joronen (P), Price: 1.0, Score: 0.68
- Pizzignacco (P), Price: 1.0, Score: 0.98
- Pereira P. (D), Price: 1.0, Score: 1.72
- Bastoni (D), Price: 1.0, Score: 2.48
- McKennie (C), Price: 1.0, Score: 2.57
- Lovric (C), Price: 1.0, Score: 2.52

5. Conclusions & Disclaimer

Conclusions:

- Each manager's strategy aims to maximize total score under strict budget and role constraints.
- Forced assignments ensure minimal positional requirements are met when normal bidding fails.
- Final stats show how each manager allocated their credits, how many forced players they took,

and their ultimate objective score.

Disclaimer:

This report is provided for educational demonstration of swarm and evolutionary algorithms in a multi-manager fantasy football auction scenario. For real-world usage, further validation and domain expertise may be required.

End of Report.