

CAN WE FIX THE MATCH FIXING PROBLEM?

AN AGENT-BASED ANALYSIS

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WHO AM I?

INFORMATION SYSTEMS STUDENT

RESEARCH ASSISTANT

AGENT-BASED MODELLER



“The Black Sox”

“Boxing’s secret \$10
Million Match Fixing Scandal”

“Tennis Match Fixing
Uncovered”

“Crashgate”

“Bundesliga Scandal”

“Sixties Scandal that
shocked the Game”



INVOLVED PARTIES

Athletes



Betting-Mafia



Control-Authority



Introduction

Match
Fixing

Agent-
Based
Modelling

Analysis
Results

Conclusion

AGENT-BASED MODELLING

Computer
Program



Artificial
World



Heterogeneous
Agents



Interaction



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THE MATCH-FIXING ABM

Medium-high Number of agents: 100 athletes

Subdivided into 3 Behavioural Types: Rational, Social, Ethical

Betting Mafia & Control Authority

Heterogeneous Agents: Individual attributes for every athlete

Interaction with the environment that can be subject to variation

Temporal Aspect: Athletes age during the simulation → Age-related decision process

Adaptive Agents: decisions may vary during every period



TOURNAMENT PROCEDURE

Pairs of 2 athletes are created

Athlete with higher talent-strength is targeted by Betting Mafia

Match Fixing Decision based on Behavioural Type Criteria



COMPUTER SIMULATION

Interface for Analysis

An Agent-Based-Analysis of Match Fixing in Competitive Sports

1) Set Up System

Number of athletes per Behavioral Type

A (Green) 40 B (Black) 40 C (Red) 20

2.1) Set Up Competitors 2.2) Play Tournament

Number of athletes participating in Match Fixing

A (Green) 0 B (Black) 0 C (Red) 0

The world in which the athletes compete

Command Center Clear

observer>

~5.000 lines of code

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COMPUTER SIMULATION

Area to specify exogenous attributes influencing the Match Fixing Decision

Specify fixed income for every player

BaseIncome
10000

Enter a win bonus for winning a tournament

WinBonus
1000

Enter a fine the athlete has to pay when being detected

Fine
100

Enter a bribery bonus set by the betting mafia to get the athlete to conduct Match Fixing

Bribery-bonus
100000

Slide the Control Effort to a desired value

Control-Effort 3

Select the number of periods an athlete is banned after being detected

BannedPeriods 3

Select how many competitions are controlled for this period

Control-Frequency 10

Probability of successful Match Fixing

q 0.80

Necessary share of Match Fixing in Social Network

NSMF 0.15

Introduction

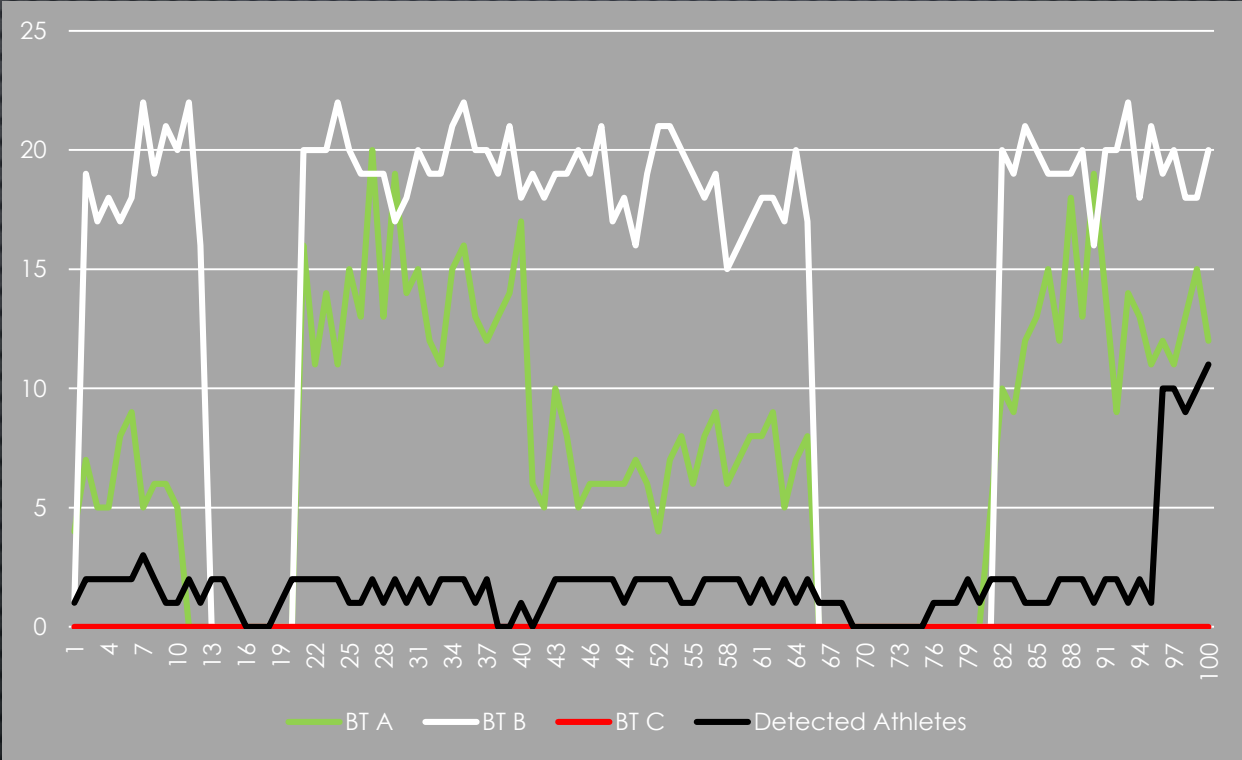
Match Fixing

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ANALYSIS OVER 100 PERIODS



FIRST ANALYSIS RESULTS

Betting Mafias have the potential to dramatically influence the Match Fixing Decision of the Rational Type by setting a higher Bribery Bonus

This also has effects on the Social Type

Control-Authority can counteract with a higher Win Bonus/higher Ban

A higher fine appears not to have a significant influence

Control Authority can achieve a higher detection rate but only with significantly higher efforts



CONCLUSION

Computer Simulation has the potential to be a powerful tool in the fight against Match Fixing

Base model already delivers first results but needs to be further specified and extended

Possible extensions: athlete experience, adapted targeting, whistle blowing, referees



THANK YOU FOR YOUR ATTENTION!



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