

# **Algorithmic systems for early detection of players at risk**

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# What is an algorithmic system?

“Describing a decision-making system as an “algorithm” is often a way to deflect accountability for human decisions.

For many, the term implies that AI or machine learning is involved using a set of rules based objectively on empirical evidence or data.

It also suggests a system that is highly complex—perhaps so complex that a human would struggle to understand its inner workings or anticipate its behavior when deployed” (MIT Technology Review).

# Algorithmic systems as part of our every day life

- searching with Google (based on PageRank algorithm by Page and Brin)
- navigation with Google maps (based on Dijkstra's algorithm)
- personalized advertising (Google, Instagram, Facebook etc.)
- creditworthiness (Schufa Score)
- .....

# Algorithmic systems in gambling

- are used by companies for revenue maximization (in customer relationship management)
- have to be used for player protection (as prescribed by gambling authorities)

Germany: Interstate Treaty requires providers to have an algorithmic system for early detection of players at risk in place and requires providers to exclude players at risk from playing

# Conflicting interest

- empirical research shows strong association between high amount of money spend and high risk score (e.g. MacAuliffe et al. 2022)
- is it in the interest of gambling providers to exclude the best costumers from play?

-> Dark Nudges and White Nudges

# Examples of Dark Nudges

- Transferring money from player account to bank account takes time and can be cancelled during a long time period
- Player who cancel a transfer receive a bonus
- Players loosing much money get credit offers or extra bonuses
- .....

# Examples of White Nudges

- Players chasing losses get a notice
- Players transferring money to bank account get a bonus
- High wins are automatically transferred to bank account
- Players may set limits
- Players may exclude themselves from playing
- .....

# Black and White Nudges

- At the time being the focus of player protection is on White Nudges but should be extended to the whole system of communication with the player
- > Providers: prevent Dark Nudges and use White Nudges



# Scientific evaluation of the algorithmic system

Which data is used for the system?

How is the data combined?

How are players classified in risk groups?

What is the percentage of players and of revenue falling in one specific risk group?

When and what measures are used for intervention?

How successful are these measures?

How is the system communicated to experts, regulators and players?

# Conflicting interest

- a classification that puts fewer people in the highest risk group is always better for providers: „journey to zero“
- a classifications with a low amount of false positives and a high amount of false negatives is preferred by providers but not by therapists

# Data

- Player account data does not reflect harm
- Of the nine DSM-V criteria for pathological gambling behavior, six criteria cannot be evaluated with player account data

# Methods

- White box (Bayesian nets, regressions models, decision trees) and black box methods (neural networks, ensemble models like random forest, support vector machines)
  - Random forest seems to perform well
  - Time series methods seem to be at the time being out of sope of the research (exception Markov chains)
  - In time series models tests of structural breaks prominent

# Classification

- Red, yellow or green
- low, medium or high risk
- how many classes and what are the cut-off values for each class of the classification?
- what is the percentage of high risk players among the population of costumers according to the classification?

# Intervention

- When and which form of intervention is used?
- What is the success of intervention and how is this evaluated?
- How many players are excluded from play by the provider?

# Conclusions

- research in the area of player protection will gain impetus
- research will be challenged by the requirements of a comprehensive and cohesive system
- the algorithm should be transparent for players and experts and trustworthy
- standards for the variables and the methods used and standards for the intervention measures will evolve