
Shortest Path Algorithms: Taxonomy and Advance in Research

my summary

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1 Introduction

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1.1 Overview

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1.2 Restatement of the Problem

- develop a model to

1.3 Our Work

- develop a model to

2 Notations and assumptions

2.1 Notations

Symbols	Description
P_{ace}	current probability of hitting an ace by a player
P_{df}	current probability of double-faulting by a player
P_{1st}	current first serve goal rate by a player
P_{fw}	current probability of winning a served point within 3 rallies
rd	current return depth of the player
P_{win}	current probability of hitting a winner by a player
P_{net}	current net win rate of a player
$dist$	the player's running distance on the point
P_{unf}	current probability of hitting an unforced error by a player
$scored$	whether the player scored the current point
$diff$	the score difference in the current game (by number of points)
M	the current momentum of a player after a point

2.2 Assumptions

To simplify the problem, we made the following assumptions:

- **Assumption 1:** The `px_unf_err` column of the data only counts those unforced errors that occurred when the player was hitting in baseline.

Justification: Usually when a player is at net, the point will end in a few strikes, and there's little probability that the player will hit an unforced error within that few strikes. What's more,

the `px_net_point` and `px_net_point_won` columns of the data can predominantly reflect the player's ability at net, therefore reducing the impact of counting the unforced errors while at net.

- **Assumption 2:** The current performance on a certain aspect of a player can be reflected by the player's 3 latest shots of that aspect.

E.g. P_{ace} can be reflected by the proportion of aces in the 3 latest **serves** of the player, P_{win} can be reflected by the proportion of winners in the 3 latest **shots** of the player, rd can be reflected by the return depth of the 3 latest **returns** of the player, etc.

Justification: The current performance of a player consists of the average performance and the status of the player at the moment, which can be comprehensively reflected in the player's performance on recent shots. For convenience, we specified that the 3 latest shots can reflect the player's current performance.

3 ... Model

Definition 3.1. *Niche width is the range of resources that a species can use.*

Niche width is an indicator [1]

3.1 Model Overview

3.2 Data Processing and Normalization

In order to obtain the factors used in our model, based on our assumptions, we calculate them using the following formulae:

$$P_{ace} = \quad (1)$$

Algorithm 1 An algorithm with caption

Require: $n \geq 0$

Ensure: $y = x^n$

$y \leftarrow 1$

$X \leftarrow x$

$N \leftarrow n$

while $N \neq 0$ **do**

if N is even **then**

$X \leftarrow X \times X$

$N \leftarrow \frac{N}{2}$

else if N is odd **then**

$y \leftarrow y \times X$

$N \leftarrow N - 1$

end if

end while

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4 Robustness Analysis

5 Strength and Weaknesses

5.1 Strengths

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5.2 Weaknesses

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References

- [1] Alice Axford, Bob Birkin, Charlie Copper, and Danny Dannford. Demonstration of bibliography items. *Journal of T_EXperts*, 36(7):114–120, Mar 2013.

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B report on Use of AI

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