Package 'unitedR'

October 13, 2015

Title Assessment and Evaluation of Formations in United

Version 0.1

Description United is a software tool which can be downloaded at \{ }href{http://
www.schroepl.net/pbm/software/united/}. In general, it is a virtual manager
game for football teams. The package unitedR contains helpful functions for
determining an optimal formation for a virtual match in United. E.g. knowing
that the opponent has a strong defensive it is advisable to beat him in the
midfield. Furthermore, unitedR contains functions for computing the optimal
usage of hardness in a game.

Depends R (>= 3.1.2),
methods,
plyr

License GPL (>=2)

LazyData true

Collate 'simRedCard.R'
'getLineup.R'
'formation.R'
'penaltyGoalsProb.R'
'summary.R'
'unitedRPackage.R'
'unitedRoverview.R'
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Suggests testthat,
knitr

VignetteBuilder knitr

R topics documented:

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unitedR-package   *Assessment and Evaluation of United Formations*

Description

Assessment and Evaluation of United Formations

Details

Package:	unitedR
Type:	Package
Version:	0.1
Date:	2014-12-18
License:	GPL (>= 2)
LazyLoad:	yes

This package provides functionality for the assessment of lineups and formations in United. The rules for United in detail can be found under: United-rules.

Author(s)

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References

omido United

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formation   *Representing a formation*

Description

Represents a valid united formation.

Usage

```
formation(GK, SW, DF, MF, ST, hardness = c(0, 0, 0, 0, 0), homeAdv = c(0, 0,
  0, 0, 0))
```

Arguments

GK	`integer` for the strength goalkeeper
SW	`vector` for the strength of the sweeper, can be `NA` or a `numeric`
DF	`numeric` vector for the strengths of the players in the defense
MF	`numeric` vector for the strengths of the players in the midfield
ST	`numeric` vector of integers for the strenghts of the strikers
hardness	`numeric` vector of length five with integers for the used hardness
homeAdv	`numeric` vector of length five with integers for the used hardness

Value

S4 object of the class `formation`.

`getLineup,formation-method`

Lineup of a united formation

Description

Generates a `numeric` vector which specifies the used united lineup

Usage

```
## S4 method for signature 'formation'
getLineup(obj)

getLineup(obj)
```

Arguments

obj	object of the class `formation`.

Value

`vector` of the used lineup

---

overview   *Overview over the parameters used in the* unitedR *package*

Description

This list of parameters yields a comprehensive overview of the parameters used in the unitedR package.

Arguments

away	away team (an object of the S4class formation)
DF	numeric vector for the strengths of the players in the defense
formation	object of the S4class formation
GK	integer for the strength goalkeeper
hardness	numeric vector of length five with integers for the used hardness
home	home team (an object of the S4class formation)
homeAdv	numeric vector of length five with integers for the used hardness
MF	numeric vector for the strengths of the players in the midfield
penaltyGoalProb	
	probability of a goal by a singular penalty
posPenalties	number of possible penalties in a game
preventGoalGK	factor multiplicied with the strength of the GK for computing the probability of preventing a goal by the goalkeeper
preventGoalSW	factor multiplicied with the strength of the SW for computing the probability of preventing a goal by the sweeper
r	number of replications for the simulation of hardness and penalties, can be missing (exact results will be computed)
ST	numeric vector of integers for the strenghts of the strikers
SW	vector for the strength of the sweeper, can be NA or a numeric
x	a variable x.

---

penaltyGoalsProb   *Computing goals by united*

Description

Computes the distribution function of possible goals by penalties.

Usage

```
penaltyGoalsProb(posPenalties, penaltyGoalProb)
```

Arguments

posPenalties   number of possible penalties in a game

penaltyGoalProb

              probability of a goal by a singular penalty

Value

A `data.frame` with two columns: the possible goals and the probability for achieving this number of goals.

---

simRedCard,formation,numeric-method
Simulate red card(s)

Description

Simulates red card(s) in the united and returns the adjusted lineup.

Usage

```
## S4 method for signature 'formation,numeric'
simRedCard(obj, lineup)

simRedCard(obj, lineup)
```

Arguments

obj   object of the class `formation`

lineup   lineup of the corresponding object `obj`

Value

vector of the adjusted lineup for the red card(s)

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summary   *Summary of assessments of a randomization procedure*

Description

Summary of assessments of a randomization procedure

Usage

```
summary(object, ...)

## S4 method for signature 'unitedSim'
summary(object)

## S4 method for signature 'unitedSimResults'
summary(object)
```

Arguments

object	object of class `unitedSimResults`
...	additional arguments affecting the summary that will be produced.

Value

`data.frame` with a summary of the assessed object.

---

unitedSim	*Simulating a formation*

Description

Simulates a formation against another formations (several formations of away are possible).

Usage

```
unitedSim(home, ..., r, preventGoalGK = 1/14, preventGoalSW = 1/15)
```

Arguments

home	home team (an object of the S4class `formation`)
...	several objects of the class `formation`
r	number of replications for the simulation of hardness and penalties, can be `missing` (exact results will be computed)
preventGoalGK	factor multiplicied with the strength of the GK for computing the probability of preventing a goal by the goalkeeper
preventGoalSW	factor multiplicied with the strength of the SW for computing the probability of preventing a goal by the sweeper

Value

Creates an object of the `unitedSim` class.

Examples

```
home <- formation(10, NA, c(7,5,3), c(8,8), c(10,10,8))
away <- formation(5, 8, c(8,8), c(10,10), c(10,10,10),
 hardness = c(0,0,0,0,1))
set.seed(123)
unitedSim(home, away)
# can also be simualated
unitedSim(home, away, r = 100)
# several away lineups
unitedSim(home, away, away)
# several away lineups simulated
unitedSim(home, away, away, r = 100)
```

---

unitedSimOne   *Simulating a formation*

Description

Simulates a formation against another formation.

Usage

```
unitedSimOne(home, away, r, preventGoalGK = 1/14, preventGoalSW = 1/15)
```

Arguments

home	home team (an object of the S4class formation)
away	away team (an object of the S4class formation)
r	number of replications for the simulation of hardness and penalties, can be missing (exact results will be computed)
preventGoalGK	factor multiplicied with the strength of the GK for computing the probability of preventing a goal by the goalkeeper
preventGoalSW	factor multiplicied with the strength of the SW for computing the probability of preventing a goal by the sweeper

Value

Creates an object of the unitedSim class.

Examples

```
home <- formation(10, NA, c(7,5,3), c(8,8), c(10,10,8))
away <- formation(5, 8, c(8,8), c(10,10), c(10,10,10),
 hardness = c(0,0,0,0,1))
set.seed(123)
unitedSimOne(home, away)
# you can even simulated the game
unitedSimOne(home, away, r = 100)
```

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