SPADL

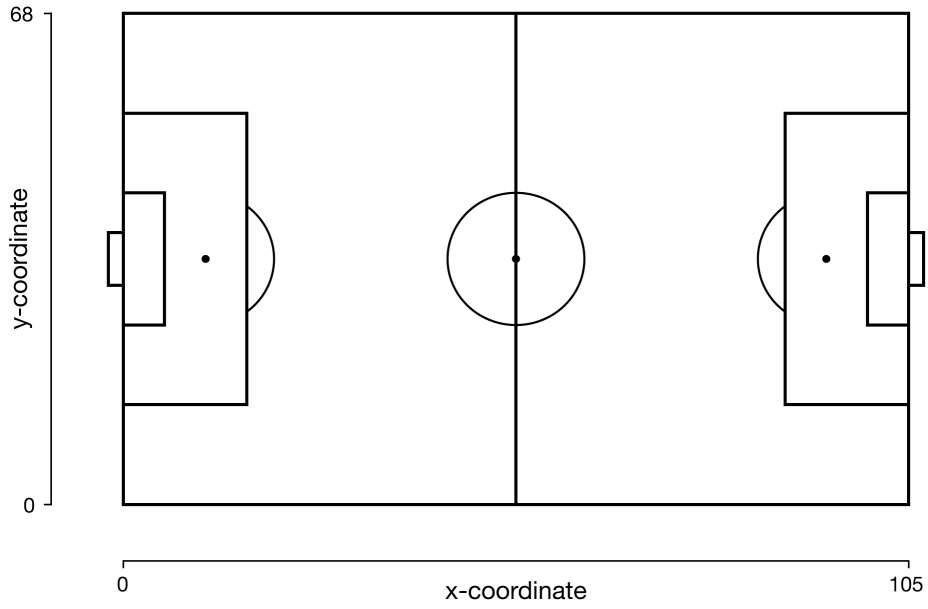
Definitions

SPADL (*Soccer Player Action Description Language*) represents a game as a sequence of on-the-ball actions $[a_1, a_2, \ldots, a_m]$, where m is the total number of actions that happened in the game. Each action is a tuple of the same twelve attributes:

Attribute	Description
game_id	the ID of the game in which the action was performed
period_id	the ID of the game period in which the action was performed
seconds	the action's start time
player	the player who performed the action
team	the player's team
start_x	the x location where the action started
start_y	the y location where the action started
end_x	the x location where the action ended
end_y	the y location where the action ended
action_type	the type of the action (e.g., pass, shot, dribble)
result	the result of the action (e.g., success or fail)
bodypart	the player's body part used for the action

Start and End Locations

SPADL uses a standardized coordinate system with the origin on the bottom left of the pitch, and a uniform field of 105m x 68m. For direction of play, SPADL uses the "home team attacks to the right" convention, but this can be converted conveniently with the `play_left_to_right()` function such that the lower x-coordinates represent the own half of the team performing the action.



Action Type

The action type attribute can have 22 possible values. These are *pass*, *cross*, *throw-in*, *crossed free kick*, *short free kick*, *crossed corner*, *short corner*, *take-on*, *foul*, *tackle*, *interception*, *shot*, *penalty shot*, *free kick shot*, *keeper save*, *keeper claim*, *keeper punch*, *keeper pick-up*, *clearance*, *bad touch*, *dribble* and *goal kick*. A detailed definition of each action type is available here.

Result

The result attribute can either have the value *success*, to indicate that an action achieved it's intended result; or the value *fail*, if this was not the case. An example of a successful action is a pass which reaches a teammate. An example of an unsuccessful action is a pass which goes over the sideline. Some action types can have special results. These are *offside* (for passes, corners and free-kicks), *own goal* (for shots), and *yellow card* and *red card* (for fouls).

Body Part

The body part attribute can have 4 possible values. These are *foot*, *head*, *other* and *none*. For Wyscout, which does not distinguish between the head and other body parts a special body part *head/other* is used.

All actions, except for some dribbles, are derived from an event in the original event stream data. They can be linked back to the original data by the *original_event_id* attribute. Synthetic dribbles are added to fill gaps between two events. These synthetic dribbles do not have an *original_event_id*.

Example

ently implements converters for `StatsBomb`, `Wyscout`, and `Op`

tsBomb data to illustrate the API, but the API of the other c

identical.

First, we load the event stream data of the third place play-off in the 2018 FIFA World Cup between Belgium and England.

```
from socceraction.data.statsbomb import StatsBombLoader

SBL = StatsBombLoader()
df_events = SBL.events(game_id=8657)
```

These events can now be converted to SPADL using the `convert_to_actions()` function of the StatsBomb converter.

```
import socceraction.spadl as spadl

df_actions = spadl.statsbomb.convert_to_actions(df_events, home_team_id=777)
```

The obtained dataframe represents the body part, result, action type, players and teams with numeric IDs. The code below adds their corresponding names.

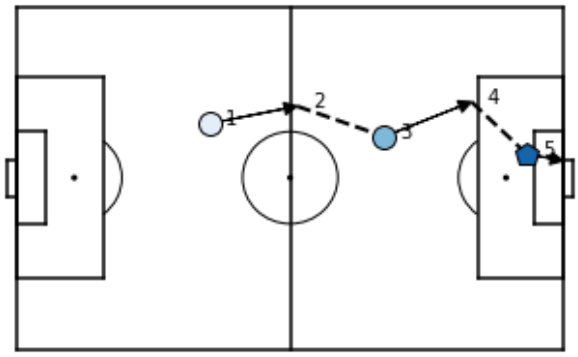
```
df_actions = (
  spadl
  .add_names(df_actions)  # add actiontype and result names
  .merge(SBL.teams(game_id=8657))  # add team names
  .merge(SBL.players(game_id=8657))  # add player names
)
```

Below are the five actions in the SPADL format leading up to Belgium's second goal.

game_id	period_id	seconds	team	player	start_x	start_y	end_x	end_y	actio
8657	2	2179	Belgium	Witsel	37.1	44.8	53.8	48.2	pass
8657	2	2181	Belgium	De Bruyne	53.8	48.2	70.6	42.2	dribbl
8657	2	2184	Belgium	De Bruyne	70.6	42.2	87.4	49.1	pass
8657	2	2185	Belgium	Hazard	87.4	49.1	97.9	38.7	dribbl
8657	2	2187	Belgium	Hazard	97.9	38.7	105	37.4	shot

Here is the same phase visualized using the `matplotsoccer` package

Skip to content latest



	time	actiontype	player	team
1	81m19s	pass	Axel Witsel	Belgium
2	81m21s	dribble	Kevin De Bruyne	Belgium
3	81m24s	pass	Kevin De Bruyne	Belgium
4	81m25s	dribble	Eden Hazard	Belgium
5	81m27s	shot	Eden Hazard	Belgium

See also

This notebook gives an example of the complete pipeline to download public StatsBomb data and convert it to the SPADL format.

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