Package 'traveltimeR'

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Title Interface to 'Travel Time' API

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Description 'Travel Time' API <https://docs.traveltime.com/api/overview/introduction> helps users find locations by journey time rather than using 'as the crow flies' distance.
Time-based searching gives users more opportunities for personalisation and delivers a more relevant search.

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Imports data.table, httr, jsonlite, RProtoBuf

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BugReports https://github.com/traveltime-dev/traveltime-sdk-r/issues

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`check_coords_for_error` *Validates location coordinates*

Description

Validates location coordinates

Usage

```
check_coords_for_error(coords)
```

Arguments

`coords`	Location coordinates. Must use this format: list(lat = 0, lng = 0)

Value

TRUE if coords are valid, FALSE otherwise

`distance_map` *Distance Map*

Description

Given origin coordinates, find shapes of zones reachable within corresponding travel distance. Find unions/intersections between different searches

Usage

```
distance_map(
  departure_searches = NULL,
  arrival_searches = NULL,
  unions = NULL,
  intersections = NULL,
  format = NULL
)
```

Arguments

departure_searches	One or more objects created by make_search
arrival_searches	One or more objects created by make_search
unions	One or more objects created by make_union_intersect
intersections	One or more objects created by make_union_intersect
format	distance-map response format. See https://docs.traveltime.com/api/reference/distance-map#Response-Body for details.

Details

See https://docs.traveltime.com/api/reference/distance-map/ for details

Value

API response parsed as a list and as a raw json

Examples

```
## Not run:

dateTime <- strftime(as.POSIXlt(Sys.time(), "UTC"), "%Y-%m-%dT%H:%M:%SZ")

departure_search <-
  make_search(id = "driving from Trafalgar Square",
              departure_time = dateTime,
              travel_distance = 900,
              coords = list(lat = 51.507609, lng = -0.128315),
              transportation = list(type = "driving"))

arrival_search <-
  make_search(id = "driving to Trafalgar Square",
              arrival_time = dateTime,
              travel_distance = 900,
              coords = list(lat = 51.507609, lng = -0.128315),
              transportation = list(type = "driving"),
              range = list(enabled = TRUE, width = 3600))
```

```
union <- make_union_intersect(id = "union of driving to and from Trafalgar Square",
                              search_ids = list('driving from Trafalgar Square',
                                                'driving to Trafalgar Square'))
intersection <- make_union_intersect(id = "intersection of driving to and from Trafalgar Square",
                              search_ids = list('driving from Trafalgar Square',
                                                'driving to Trafalgar Square'))
result <-
  distance_map(
    departure_searches = departure_search,
    arrival_searches = arrival_search,
    unions = union,
    intersections = intersection
  )

## End(Not run)
```

`geocoding` *Geocoding (Search)*

Description

Match a query string to geographic coordinates.

Usage

```
geocoding(
  query,
  within.country = NA,
  format.name = NA,
  format.exclude.country = NA,
  bounds = NA
)
```

Arguments

`query`	A query to geocode. Can be an address, a postcode or a venue.
`within.country`	Only return the results that are within the specified country. If no results are found it will return the country itself. Optional. Format:ISO 3166-1 alpha-2 or alpha-3
`format.name`	Format the name field of the response to a well formatted, human-readable address of the location. Experimental. Optional.
`format.exclude.country`	Exclude the country from the formatted name field (used only if format.name is equal true). Optional.
`bounds`	Used to limit the results to a bounding box. Expecting a character vector with four floats, marking a south-east and north-west corners of a rectangle: min-latitude,min-longitude,max-latitude,max-longitude. e.g. bounds for Scandinavia c(54.16243,4.04297,71.18316,31.81641). Optional.

Details

See https://docs.traveltime.com/api/reference/geocoding-search/ for details

Value

API response parsed as list and as a raw json

Examples

```
## Not run:
geocoding('Parliament square')

## End(Not run)
```

---

geocoding_reverse *Reverse Geocoding*

Description

Attempt to match a latitude, longitude pair to an address.

Usage

```
geocoding_reverse(lat, lng)
```

Arguments

lat	Latitude of the point to reverse geocode.
lng	Longitude of the point to reverse geocode.

Details

See https://docs.traveltime.com/api/reference/geocoding-reverse/ for details

Value

API response parsed as list and as a raw json

Examples

```
## Not run:
geocoding_reverse(lat=51.507281, lng=-0.132120)

## End(Not run)
```

make_location *Location objects constructor*

Description

Define your locations to use later in departure_searches or arrival_searches.

Usage

```
make_location(id, coords)
```

Arguments

id	You will have to reference this id in your searches. It will also be used in the response body. MUST be unique among all locations.
coords	Location coordinates. Must use this format: list(lat = 0, lng = 0)

Details

See https://docs.traveltime.com/api/reference/distance-matrix for details

Value

A data.frame wrapped in a list. It is constructed in a way that allows jsonlite::toJSON to correctly transform it into a valid request body

See Also

See time_filter for usage examples

make_search *Search objects constructor*

Description

Searches based on departure or arrival times. Departure: Leave departure location at no earlier than given time. You can define a maximum of 10 searches Arrival: Arrive at destination location at no later than given time. You can define a maximum of 10 searches

Usage

```
make_search(
  id,
  travel_time = NA,
  coords = NA,
  departure_time = NA,
  arrival_time = NA,
  transportation = list(type = "driving"),
  ...
)
```

Arguments

id	Used to identify this specific search in the results array. MUST be unique among all searches.
travel_time	Travel time in seconds. Maximum value is 14400 (4 hours)
coords	The coordinates of the location we should start the search from. Must use this format: list(lat = 0, lng = 0)
departure_time	Date in extended ISO-8601 format
arrival_time	Date in extended ISO-8601 format
transportation	Transportation mode and related parameters.
...	Any additional parameters to pass. Some functions require extra parameters to work. Check their API documentation for details.

Value

A data.frame wrapped in a list. It is constructed in a way that allows jsonlite::toJSON to correctly transform it into a valid request body

See Also

See time_map for usage examples

---

make_union_intersect *Set objects constructor*

Description

Allows you to define unions or intersections of shapes that are results of previously defined searches. You can define a maximum of 10 unions/intersections

Usage

```
make_union_intersect(id, search_ids)
```

Arguments

id	Used to identify this specific search in the results array. MUST be unique among all searches.
search_ids	An unnamed list of search ids which results will formulate this union.

Details

See https://docs.traveltime.com/api/reference/isochrones for details

Value

A data.frame wrapped in a list. It is constructed in a way that allows jsonlite::toJSON to correctly transform it into a valid request body

See Also

See time_map for usage examples

---

map_info *Map Info*

Description

Returns information about currently supported countries.

Usage

```
map_info()
```

Details

See https://docs.traveltime.com/api/reference/map-info/ for details

Value

API response parsed as list and as a raw json

Examples

```
## Not run:
map_info()

## End(Not run)
```

routes *Routes*

Description

Returns routing information between source and destinations.

Usage

```
routes(locations, departure_searches = NULL, arrival_searches = NULL)
```

Arguments

locations	One or more objects created by make_location
departure_searches	One or more objects created by make_search
arrival_searches	One or more objects created by make_search

Details

See https://docs.traveltime.com/api/reference/routes/ for details

Value

API response parsed as a list and as a raw json

Examples

```
## Not run:
locations <- c(
  make_location(
    id = 'London center',
    coords = list(lat = 51.508930, lng = -0.131387)),
  make_location(
    id = 'Hyde Park',
    coords = list(lat = 51.508824, lng = -0.167093)),
  make_location(
    id = 'ZSL London Zoo',
    coords = list(lat = 51.536067, lng = -0.153596))
)

departure_search <-
  make_search(id = "departure search example",
              departure_location_id = "London center",
              arrival_location_ids = list("Hyde Park", "ZSL London Zoo"),
          departure_time = strftime(as.POSIXlt(Sys.time(), "UTC"), "%Y-%m-%dT%H:%M:%SZ"),
              transportation = list(type = "driving"),
              properties = list("travel_time", "distance", "route"))
```

```
arrival_search <-
  make_search(id = "arrival  search example",
              arrival_location_id = "London center",
              departure_location_ids = list("Hyde Park", "ZSL London Zoo"),
            arrival_time = strftime(as.POSIXlt(Sys.time(), "UTC"), "%Y-%m-%dT%H:%M:%SZ"),
              transportation = list(type = "public_transport"),
              properties = list('travel_time', "distance", "route", "fares"),
              range = list(enabled = TRUE, width = 1800, max_results = 1))

result <-
  routes(
    departure_searches = departure_search,
    arrival_searches = arrival_search,
    locations = locations
  )

## End(Not run)
```

`supported_locations` *Supported Locations*

Description

Find out what points are supported by the api. The returned map name for a point can be used to determine what features are supported. See also the `map_info`.

Usage

```
supported_locations(locations)
```

Arguments

`locations`	One or more objects created by `make_location`

Details

See https://docs.traveltime.com/api/reference/supported-locations/ for details

Value

API response parsed as list and as a raw json

Examples

```
## Not run:
locationsDF <- data.frame(
  id = c('Kaunas', 'London', 'Bangkok', 'Lisbon'),
  lat = c(54.900008, 51.506756, 13.761866, 38.721869),
  lng = c(23.957734, -0.128050, 100.544818, -9.138549)
```

```
)
locations <- apply(locationsDF, 1, function(x)
  make_location(id = x['id'], coords = list(lat = as.numeric(x["lat"]),
                                            lng = as.numeric(x["lng"]))))
supported_locations(unlist(locations, recursive = FALSE))

## End(Not run)
```

`time_filter` *Distance Matrix (Time Filter)*

Description

Given origin and destination points filter out points that cannot be reached within specified time limit. Find out travel times, distances and costs between an origin and up to 2,000 destination points.

Usage

```
time_filter(locations, departure_searches = NULL, arrival_searches = NULL)
```

Arguments

`locations`	One or more objects created by `make_location`
`departure_searches`	One or more objects created by `make_search`
`arrival_searches`	One or more objects created by `make_search`

Details

See https://docs.traveltime.com/api/reference/travel-time-distance-matrix/ for details

Value

API response parsed as a list and as a raw json

Examples

```
## Not run:
locationsDF <- data.frame(
  id = c('London center', 'Hyde Park', 'ZSL London Zoo'),
  lat = c(51.508930, 51.508824, 51.536067),
  lng = c(-0.131387, -0.167093, -0.153596)
  )
locations <- apply(locationsDF, 1, function(x)
  make_location(id = x['id'], coords = list(lat = as.numeric(x["lat"]),
                                            lng = as.numeric(x["lng"]))))
```

```
locations <- unlist(locations, recursive = FALSE)

departure_search <-
  make_search(id = "forward search example",
              departure_location_id = "London center",
              arrival_location_ids = list("Hyde Park", "ZSL London Zoo"),
           departure_time = strftime(as.POSIXlt(Sys.time(), "UTC"), "%Y-%m-%dT%H:%M:%SZ"),
              travel_time = 1800,
              transportation = list(type = "bus"),
              properties = list('travel_time'),
              range = list(enabled = TRUE, width = 600, max_results = 3))

arrival_search <-
  make_search(id = "backward search example",
              arrival_location_id = "London center",
              departure_location_ids = list("Hyde Park", "ZSL London Zoo"),
            arrival_time = strftime(as.POSIXlt(Sys.time(), "UTC"), "%Y-%m-%dT%H:%M:%SZ"),
              travel_time = 1800,
              transportation = list(type = "public_transport"),
             properties = list('travel_time', "distance", "distance_breakdown", "fares"),
              range = list(enabled = TRUE, width = 600, max_results = 3))

result <-
  time_filter(
    departure_searches = departure_search,
    arrival_searches = arrival_search,
    locations = locations
  )

## End(Not run)
```

`time_filter_fast` *Time Filter (Fast)*

Description

A very fast version of `time_filter`. However, the request parameters are much more limited. Currently only supports UK and Ireland.

Usage

```
time_filter_fast(
  locations,
  arrival_many_to_one = NULL,
  arrival_one_to_many = NULL
)
```

Arguments

locations	One or more objects created by make_location
arrival_many_to_one	One or more objects created by make_search
arrival_one_to_many	One or more objects created by make_search

Details

See https://docs.traveltime.com/api/reference/time-filter-fast/ for details

Value

API response parsed as a list and as a raw json

Examples

```
## Not run:

locations <- c(
  make_location(
    id = 'London center',
    coords = list(lat = 51.508930, lng = -0.131387)),
  make_location(
    id = 'Hyde Park',
    coords = list(lat = 51.508824, lng = -0.167093)),
  make_location(
    id = 'ZSL London Zoo',
    coords = list(lat = 51.536067, lng = -0.153596))
  )
arrival_many_to_one <- make_search(id = "arrive-at many-to-one search example",
                                   arrival_location_id = "London center",
                               departure_location_ids = list("Hyde Park", "ZSL London Zoo"),
                                   travel_time = 1900,
                                   transportation = list(type = "public_transport"),
                                   properties = list('travel_time', "fares"),
                                   arrival_time_period = "weekday_morning")

arrival_one_to_many <- make_search(id = "arrive-at one-to-many search example",
                                   departure_location_id = "London center",
                                 arrival_location_ids = list("Hyde Park", "ZSL London Zoo"),
                                   travel_time = 1900,
                                   transportation = list(type = "public_transport"),
                                   properties = list('travel_time', "fares"),
                                   arrival_time_period = "weekday_morning")

result <- time_filter_fast(locations, arrival_many_to_one, arrival_one_to_many)

## End(Not run)
```

`time_filter_fast_proto` *Time Filter (Fast) with Protobuf*

Description

The Travel Time Matrix (Fast) endpoint is available with even higher performance through a version using Protocol Buffers. The endpoint takes as inputs a single origin location, multiple destination locations, a mode of transport, and a maximum travel time. The endpoint returns the travel times to each destination location, so long as it is within the maximum travel time.

Usage

```
time_filter_fast_proto(
  departureLat,
  departureLng,
  country = c(
    "nl", "at", "uk", "be", "de", "fr", "ie", "lt", "us", "za",
    "ro", "pt", "ph", "nz", "no", "lv", "jp", "in", "id", "hu",
    "gr", "fi", "dk", "ca", "au", "sg", "ch", "es", "it", "pl",
    "se", "li", "mx", "sa", "rs", "si"
 ),
  travelTime,
  destinationCoordinates,
  transportation = names(protoTransport),
  useDistance = FALSE
)
```

Arguments

`departureLat`	origin latitude
`departureLng`	origin longitude
`country`	Origin country. See https://docs.traveltime.com/api/overview/supported-countries for the list of supported countries
`travelTime`	Maximum journey time (in seconds).
`destinationCoordinates`	data.frame with pairs of coordinates. Coordinates columns must be named 'lat' and 'lng'
`transportation`	One of supported transportation methods: 'pt', 'driving+ferry', 'cycling+ferry', 'walking+ferry'.
`useDistance`	return distance information

Details

See https://docs.traveltime.com/api/start/travel-time-distance-matrix-proto for details

Value

API response parsed as a list and as a raw json

Examples

```
## Not run:
time_filter_fast_proto(
departureLat = 51.508930,
departureLng = -0.131387,
destinationCoordinates = data.frame(
  lat = c(51.508824, 51.536067),
  lng = c(-0.167093, -0.153596)
),
transportation = 'driving+ferry',
travelTime = 7200,
country = "uk",
useDistance = FALSE
)

## End(Not run)
```

---

time_filter_postcodes *Time Filter (Postcodes)*

Description

Find reachable postcodes from origin (or to destination) and get statistics about such postcodes. Currently only supports United Kingdom.

Usage

```
time_filter_postcodes(departure_searches = NULL, arrival_searches = NULL)
```

Arguments

departure_searches	One or more objects created by make_search
arrival_searches	One or more objects created by make_search

Details

See https://docs.traveltime.com/api/reference/postcode-search/ for details

Value

API response parsed as a list and as a raw json

Examples

```
## Not run:
departure_search <-
 make_search(id = "public transport from Trafalgar Square",
          departure_time = strftime(as.POSIXlt(Sys.time(), "UTC"), "%Y-%m-%dT%H:%M:%SZ"),
             travel_time = 1800,
             coords = list(lat = 51.507609, lng = -0.128315),
             transportation = list(type = "public_transport"),
             properties = list('travel_time', 'distance'))

arrival_search <-
  make_search(id = "public transport to Trafalgar Square",
            arrival_time = strftime(as.POSIXlt(Sys.time(), "UTC"), "%Y-%m-%dT%H:%M:%SZ"),
              travel_time = 1800,
              coords = list(lat = 51.507609, lng = -0.128315),
              transportation = list(type = "public_transport"),
              properties = list('travel_time', 'distance'))

result <-
  time_filter_postcodes(
    departure_searches = departure_search,
    arrival_searches = arrival_search
  )

## End(Not run)
```

---

time_filter_postcode_districts

Time Filter (Postcode Districts)

Description

Find districts that have a certain coverage from origin (or to destination) and get statistics about postcodes within such districts. Currently only supports United Kingdom.

Usage

```
time_filter_postcode_districts(
  departure_searches = NULL,
  arrival_searches = NULL
)
```

Arguments

`departure_searches`
: One or more objects created by `make_search`

`arrival_searches`
: One or more objects created by `make_search`

Details

See https://docs.traveltime.com/api/reference/postcode-district-filter/ for details

Value

API response parsed as a list and as a raw json

Examples

```
## Not run:
departure_search <-
  make_search(id = "public transport from Trafalgar Square",
          departure_time = strftime(as.POSIXlt(Sys.time(), "UTC"), "%Y-%m-%dT%H:%M:%SZ"),
              travel_time = 1800,
              coords = list(lat = 51.507609, lng = -0.128315),
              transportation = list(type = "public_transport"),
              reachable_postcodes_threshold = 0.1,
              properties = list("coverage", "travel_time_reachable", "travel_time_all"))

arrival_search <-
  make_search(id = "public transport to Trafalgar Square",
            arrival_time = strftime(as.POSIXlt(Sys.time(), "UTC"), "%Y-%m-%dT%H:%M:%SZ"),
              travel_time = 1800,
              coords = list(lat = 51.507609, lng = -0.128315),
              transportation = list(type = "public_transport"),
              reachable_postcodes_threshold = 0.1,
              properties = list("coverage", "travel_time_reachable", "travel_time_all"))

result <-
  time_filter_postcode_districts(
    departure_searches = departure_search,
    arrival_searches = arrival_search
  )

## End(Not run)
```

---

time_filter_postcode_sectors

Time Filter (Postcode Sectors)

Description

Find sectors that have a certain coverage from origin (or to destination) and get statistics about postcodes within such sectors. Currently only supports United Kingdom.

Usage

```
time_filter_postcode_sectors(
  departure_searches = NULL,
  arrival_searches = NULL
)
```

Arguments

departure_searches	One or more objects created by make_search
arrival_searches	One or more objects created by make_search

Details

See https://docs.traveltime.com/api/reference/postcode-sector-filter/ for details

Value

API response parsed as a list and as a raw json

Examples

```
## Not run:
departure_search <-
  make_search(id = "public transport from Trafalgar Square",
          departure_time = strftime(as.POSIXlt(Sys.time(), "UTC"), "%Y-%m-%dT%H:%M:%SZ"),
              travel_time = 1800,
              coords = list(lat = 51.507609, lng = -0.128315),
              transportation = list(type = "public_transport"),
              reachable_postcodes_threshold = 0.1,
              properties = list("coverage", "travel_time_reachable", "travel_time_all"))

arrival_search <-
  make_search(id = "public transport to Trafalgar Square",
            arrival_time = strftime(as.POSIXlt(Sys.time(), "UTC"), "%Y-%m-%dT%H:%M:%SZ"),
              travel_time = 1800,
              coords = list(lat = 51.507609, lng = -0.128315),
              transportation = list(type = "public_transport"),
              reachable_postcodes_threshold = 0.1,
              properties = list("coverage", "travel_time_reachable", "travel_time_all"))

result <-
  time_filter_postcode_sectors(
    departure_searches = departure_search,
    arrival_searches = arrival_search
  )

## End(Not run)
```

time_map *Isochrones (Time Map)*

Description

Given origin coordinates, find shapes of zones reachable within corresponding travel time. Find unions/intersections between different searches

Usage

```
time_map(
  departure_searches = NULL,
  arrival_searches = NULL,
  unions = NULL,
  intersections = NULL,
  format = NULL
)
```

Arguments

departure_searches	One or more objects created by make_search
arrival_searches	One or more objects created by make_search
unions	One or more objects created by make_union_intersect
intersections	One or more objects created by make_union_intersect
format	time-map response format. See https://docs.traveltime.com/api/reference/isochrones#Response-Body for details.

Details

See https://docs.traveltime.com/api/reference/isochrones/ for details

Value

API response parsed as a list and as a raw json

Examples

```
## Not run:

dateTime <- strftime(as.POSIXlt(Sys.time(), "UTC"), "%Y-%m-%dT%H:%M:%SZ")

departure_search1 <-
  make_search(id = "public transport from Trafalgar Square",
              departure_time = dateTime,
              travel_time = 900,
```

```
              coords = list(lat = 51.507609, lng = -0.128315),
              transportation = list(type = "public_transport"),
              properties = list('is_only_walking'))

departure_search2 <-
  make_search(id = "driving from Trafalgar Square",
              departure_time = dateTime,
              travel_time = 900,
              coords = list(lat = 51.507609, lng = -0.128315),
              transportation = list(type = "driving"))

arrival_search <-
  make_search(id = "public transport to Trafalgar Square",
              arrival_time = dateTime,
              travel_time = 900,
              coords = list(lat = 51.507609, lng = -0.128315),
              transportation = list(type = "public_transport"),
              range = list(enabled = TRUE, width = 3600))

union <- make_union_intersect(id = "union of driving and public transport",
                              search_ids = list('driving from Trafalgar Square',
                                                'public transport from Trafalgar Square'))
intersection <- make_union_intersect(id = "intersection of driving and public transport",
                              search_ids = list('driving from Trafalgar Square',
                                                'public transport from Trafalgar Square'))
result <-
  time_map(
    departure_searches = c(departure_search1, departure_search2),
    arrival_searches = arrival_search,
    unions = union,
    intersections = intersection
  )

## End(Not run)
```

`time_map_fast` *Isochrones (Time Map) Fast*

Description

A very fast version of Isochrone API. However, the request parameters are much more limited.

Usage

```
time_map_fast(
  arrival_many_to_one = NULL,
  arrival_one_to_many = NULL,
  format = NULL
)
```

Arguments

arrival_many_to_one	One or more objects created by make_search
arrival_one_to_many	One or more objects created by make_search
format	time-map response format. See https://docs.traveltime.com/api/reference/isochrones-fast#Response-Body for details.

Details

See https://docs.traveltime.com/api/reference/isochrones-fast/ for details

Value

API response parsed as a list and as a raw json

Examples

```
## Not run:

arrival_search <-
  make_search(id = "public transport to Trafalgar Square",
              travel_time = 900,
              coords = list(lat = 51.507609, lng = -0.128315),
              arrival_time_period = "weekday_morning",
              transportation = list(type = "public_transport"))

result <-
  time_map_fast(
    arrival_many_to_one = arrival_search
  )

## End(Not run)
```

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