Package: vald.extractor (via r-universe)

May 23, 2026

Type Package

Title Robust Pipeline for 'VALD' 'ForceDecks' Data Extraction and Analysis

Version 0.1.1

Description Provides a robust and reproducible pipeline for extracting, cleaning, and analyzing athlete performance data generated by 'VALD' 'ForceDecks' systems. The package supports batch-oriented data processing for large datasets, standardized data transformation workflows, and visualization utilities for sports science research and performance monitoring. It is designed to facilitate reproducible analysis across multiple sports with comprehensive documentation and error handling.

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Encoding UTF-8

RoxygenNote 7.3.3

Imports readxl, httr, jsonlite, data.table, ggplot2, dplyr, tidyr, stringr, lubridate, valdr, stats, utils

Suggests knitr, rmarkdown, testthat (>= 3.0.0)

VignetteBuilder knitr

URL `https://github.com/praveenmaths89/vald.extractor`

BugReports `https://github.com/praveenmaths89/vald.extractor/issues`

Config/pak/sysreqs libicu-dev libsecret-1-dev libssl-dev libx11-dev

Repository https://praveenmaths89.r-universe.dev

Date/Publication 2026-01-22 18:18:38 UTC

RemoteUrl https://github.com/praveenmaths89/vald.extractor

RemoteRef HEAD

RemoteSha 4e392e1ee3d618aad56045de5d366ca60555371d

Contents

`classify_sports` *Automated Sports Taxonomy Mapping*

Description

Applies regex-based pattern matching to standardize inconsistent sport/team naming conventions into a clean categorical variable. This is the core "value-add" for multi-sport organizations where team names may vary (e.g., "Football", "Soccer", "FSI" all map to "Football").

Usage

```
classify_sports(
  data,
  group_col = "all_group_names",
  output_col = "sports_clean"
)
```

Arguments

`data`	Data frame containing athlete metadata.
`group_col`	Character. Name of the column containing group/team names. Default is "all_group_names".
`output_col`	Character. Name for the new standardized sports column. Default is "sports_clean".

Details

Classify Sports from Group Names

Value

Data frame with an additional column containing standardized sports categories.

Examples

```
if (FALSE) {
  metadata <- standardize_vald_metadata(profiles, groups)
  metadata <- classify_sports(metadata)
  table(metadata$sports_clean)
}
```

`fetch_vald_batch` *Robust Batch Extraction of VALD Trials*

Description

Implements chunked trial extraction from VALD ForceDecks API with fault-tolerant error handling. This function prevents timeout errors and memory issues when working with large datasets by processing data in manageable chunks.

Usage

```
fetch_vald_batch(start_date, chunk_size = 100, verbose = TRUE)
```

Arguments

`start_date`	Character string in ISO 8601 format (e.g., "2020-01-01T00:00:00Z"). The starting date for data extraction.
`chunk_size`	Integer. Number of tests to process per batch. Default is 100. Reduce this value if you experience timeout errors.
`verbose`	Logical. If TRUE, prints progress messages. Default is TRUE.

Details

Fetch VALD ForceDecks Data in Batches

This function first retrieves all test metadata, then iterates through tests in chunks to fetch associated trial data. Each chunk is wrapped in a tryCatch block to ensure that errors in one chunk do not halt the entire extraction process.

The chunking strategy is essential for large organizations with thousands of tests, as it prevents API timeout errors and reduces memory pressure.

Value

A list containing two data frames:

tests Data frame of all tests metadata

trials Data frame of all trials (individual repetitions) data

Examples

```
if (FALSE) {
  # Set VALD credentials first
  valdr::set_credentials(
    client_id = "your_client_id",
    client_secret = "your_client_secret",
    tenant_id = "your_tenant_id",
    region = "aue"
  )

  # Fetch data from 2020 onwards in chunks of 100
  vald_data <- fetch_vald_batch(
    start_date = "2020-01-01T00:00:00Z",
    chunk_size = 100
  )

  # Access tests and trials
  tests_df <- vald_data$tests
  trials_df <- vald_data$trials
}
```

`fetch_vald_metadata` *Retrieve Athlete Profiles and Group Assignments*

Description

Authenticates with VALD API using OAuth2 client credentials flow and retrieves complete athlete profile and group membership data. This function handles token management, pagination, and robust JSON parsing.

Usage

```
fetch_vald_metadata(
  client_id,
  client_secret,
  tenant_id,
  region = "aue",
  verbose = TRUE
)
```

Arguments

`client_id`	Character. Your VALD API client ID.
`client_secret`	Character. Your VALD API client secret.
`tenant_id`	Character. Your VALD tenant ID.
`region`	Character. VALD region code (e.g., "aue" for Australia East). Default is "aue".
`verbose`	Logical. If TRUE, prints progress messages. Default is TRUE.

Details

Fetch VALD Metadata via OAuth2

Value

A list containing two data frames:

profiles Complete athlete profile data

groups Group/team membership data

Examples

```
if (FALSE) {
  metadata <- fetch_vald_metadata(
    client_id = "your_client_id",
    client_secret = "your_client_secret",
    tenant_id = "your_tenant_id"
  )

  profiles <- metadata$profiles
  groups <- metadata$groups
}
```

`patch_metadata` *Fix Missing or Incorrect Athlete Demographics*

Description

Allows users to provide an external Excel or CSV file containing corrected demographic information (e.g., sex, date of birth) for athletes with missing or incorrect data in the VALD system. This function merges the corrections and updates the master metadata.

Usage

```
patch_metadata(
  data,
  patch_file,
  patch_sheet = 1,
  id_col = "profileId",
  fields_to_patch = c("sex", "dateOfBirth"),
  verbose = TRUE
)
```

Arguments

`data`	Data frame. Master metadata or analysis dataset.
`patch_file`	Character. Path to Excel (.xlsx) or CSV (.csv) file containing corrections.
`patch_sheet`	Character or integer. For Excel files, which sheet to read. Default is 1 (first sheet).
`id_col`	Character. Name of the ID column in both `data` and `patch_file`. Default is "profileId".
`fields_to_patch`	Character vector. Column names to update from the patch file. Default is c("sex", "dateOfBirth").
`verbose`	Logical. If TRUE, prints progress messages. Default is TRUE.

Details

Patch Missing Metadata from External File

Value

Data frame with patched metadata.

Examples

```
if (FALSE) {
  # Create an Excel file with columns: profileId, sex, dateOfBirth
  # Then patch the metadata
  patched_data <- patch_metadata(
    data = athlete_metadata,
    patch_file = "corrections.xlsx",
    fields_to_patch = c("sex", "dateOfBirth")
  )

  # Check results
  table(patched_data$sex)
}
```

`plot_vald_compare` *Boxplot Comparison of Metrics by Sport, Sex, or Team*

Description

Creates boxplots to compare performance metrics across different groups (e.g., sports, sex, teams). Useful for benchmarking and identifying performance differences between populations.

Usage

```
plot_vald_compare(
  data,
  metric_col,
  group_col = "sports",
  fill_col = "sex",
  title = NULL,
  y_label = NULL
)
```

Arguments

`data`	Data frame. Test data with grouping variables and metrics.
`metric_col`	Character. Name of the metric to plot.
`group_col`	Character. Primary grouping variable (x-axis). Default is "sports".
`fill_col`	Character. Optional fill color grouping (e.g., "sex"). Default is "sex".
`title`	Character. Plot title. If NULL, auto-generates from metric name.
`y_label`	Character. Y-axis label. If NULL, uses metric_col.

Details

Compare Performance Across Groups

Value

A ggplot2 object.

Examples

```
if (FALSE) {
  test_datasets <- split_by_test(final_analysis_data)

  # Compare CMJ peak force across sports and sex
  plot_vald_compare(
    data = test_datasets$CMJ,
    metric_col = "PEAK_FORCE_Both",
    group_col = "sports",
    fill_col = "sex",
    title = "Peak Force Comparison by Sport and Sex"
  )
}
```

`plot_vald_trends` *Time-Series Visualization of Performance Metrics*

Description

Creates professional line plots showing how performance metrics change over time for individual athletes or groups. Useful for tracking training adaptations, injury recovery, and seasonal trends.

Usage

```
plot_vald_trends(
  data,
  date_col = "Testdate",
  metric_col,
  group_col = NULL,
  facet_col = NULL,
  title = NULL,
  smooth = FALSE
)
```

Arguments

`data`	Data frame. Test data with a date column and at least one metric.
`date_col`	Character. Name of the date column. Default is "Testdate".
`metric_col`	Character. Name of the metric to plot.
`group_col`	Character. Optional grouping variable (e.g., "profileId", "sports"). If provided, separate lines are drawn for each group.
`facet_col`	Character. Optional faceting variable (e.g., "sex"). Creates separate panels for each level.
`title`	Character. Plot title. If NULL, auto-generates from metric name.
`smooth`	Logical. If TRUE, adds a smoothed trend line. Default is FALSE.

Details

Plot Longitudinal Trends for VALD Metrics

Value

A ggplot2 object.

Examples

```
if (FALSE) {
  test_datasets <- split_by_test(final_analysis_data)

  # Plot individual athlete trends
  plot_vald_trends(
    data = test_datasets$CMJ,
    metric_col = "PEAK_FORCE_Both",
    group_col = "profileId",
    facet_col = "sex"
  )

  # Plot sport-level averages
  sport_avg <- test_datasets$CMJ %>%
    group_by(Testdate, sports) %>%
    summarise(avg_force = mean(PEAK_FORCE_Both, na.rm = TRUE))

  plot_vald_trends(
    data = sport_avg,
    date_col = "Testdate",
    metric_col = "avg_force",
    group_col = "sports"
  )
}
```

`split_by_test` *Generic Test-Type Splitting with Suffix Removal*

Description

Takes a master wide-format dataset and returns a named list of data frames, one per test type (e.g., CMJ, DJ, ISO). Crucially, this function automatically strips the test-type suffix from column names within each sub-dataframe, enabling generic analysis code that works across all test types.

This implements the "DRY" (Don't Repeat Yourself) principle by allowing users to write one analysis function that works for any test type.

Usage

```
split_by_test(data, metadata_cols = NULL, verbose = TRUE)
```

Arguments

`data`	Data frame. Wide-format test data with columns ending in test type suffixes (e.g., "PEAK_FORCE_Both_CMJ").
`metadata_cols`	Character vector. Column names to retain as metadata in each split dataset. Default includes common identifiers and demographics.
`verbose`	Logical. If TRUE, prints progress messages. Default is TRUE.

Details

Split Wide-Format Data by Test Type

Value

Named list of data frames, one per test type. Each data frame contains:

- All metadata columns
- Test-specific metrics with suffixes removed (e.g., "PEAK_FORCE_Both")

Examples

```
if (FALSE) {
  # After joining tests, trials, and metadata into wide format
  test_datasets <- split_by_test(
    data = final_analysis_data,
    metadata_cols = c("profileId", "sex", "Testdate", "age", "sports")
  )

  # Access individual test datasets
  cmj_data <- test_datasets$CMJ
  dj_data <- test_datasets$DJ

 # Note: Column names are now generic (e.g., "PEAK_FORCE_Both" not "PEAK_FORCE_Both_CMJ")
  # This allows you to write one function that works for all test types
}
```

`standardize_vald_metadata`

Create Unified Athlete Metadata with Group Assignments

Description

Processes raw profile and group data to create a clean, analysis-ready metadata table. Unnests group memberships, concatenates group names, and applies sports classification logic.

Usage

```
standardize_vald_metadata(profiles, groups, verbose = TRUE)
```

Arguments

`profiles`	Data frame. Raw profile data from `fetch_vald_metadata()`.
`groups`	Data frame. Raw group data from `fetch_vald_metadata()`.
`verbose`	Logical. If TRUE, prints progress messages. Default is TRUE.

Details

Standardize VALD Metadata

Value

A data frame with one row per athlete containing:

profileId Unique athlete identifier

givenName, familyName Athlete names

dateOfBirth, sex Demographic information

all_group_names Comma-separated list of all group memberships

all_group_ids Comma-separated list of all group IDs

Examples

```
if (FALSE) {
  metadata <- fetch_vald_metadata(client_id, client_secret, tenant_id)
  clean_metadata <- standardize_vald_metadata(
    profiles = metadata$profiles,
    groups = metadata$groups
  )
}
```

`summary_vald_metrics` *Dynamic Summary Table for Performance Metrics*

Description

Creates a comprehensive summary table showing mean, standard deviation, coefficient of variation, and sample size for all numeric performance metrics. Can be grouped by test type, sex, sport, or any combination thereof.

Usage

```
summary_vald_metrics(
  data,
  group_vars = c("sex", "sports"),
 exclude_cols = c("profileId", "athleteId", "testId", "Testdate", "dateofbirth", "age",
    "Weight_on_Test_Day"),
  digits = 2
)
```

Arguments

`data`	Data frame. Test data (typically from `split_by_test()`).
`group_vars`	Character vector. Variables to group by. Default is c("sex", "sports").
`exclude_cols`	Character vector. Column names to exclude from summary (typically metadata columns). Default includes common ID and date fields.
`digits`	Integer. Number of decimal places for rounding. Default is 2.

Details

Generate Summary Statistics for VALD Metrics

Value

Data frame with summary statistics (Mean, SD, CV, N) for each metric and grouping combination.

Examples

```
if (FALSE) {
  test_datasets <- split_by_test(final_analysis_data)
  cmj_summary <- summary_vald_metrics(
    data = test_datasets$CMJ,
    group_vars = c("sex", "sports")
  )
  print(cmj_summary)
}
```

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