Package: FITfileR (via r-universe)

October 13, 2026

Version 0.1.11

Title Read FIT files using only native R code

Description The 'FIT' (Flexible and Interoperable Data Transfer) protocol is designed specifically for sharing data from fitness and health devices. This package allows reading 'FIT' files in pure R without any dependence on external software or SDKs.

URL https://github.com/grimbough/FITfileR

Depends R (>= 3.5.0)

Imports dplyr, tibble, magrittr, methods, bit64

Suggests knitr, rmarkdown, leaflet, ggplot2, tinytest, zoo, tidyr, ggforce

VignetteBuilder knitr

License Artistic-2.0

LazyLoad yes

Roxygen list(markdown = TRUE)

RoxygenNote 7.3.2

Encoding UTF-8

Collate 'FITfileR.R' 'class_validity.R' 'allClasses.R' 'allGenerics.R' 'allMethods.R' 'dataFormatting.R' 'file_type_checks.R' 'methods_FitFile_accessors.R' 'methods_FitFile_dim.R' 'methods_Messages_accessors.R' 'read_headers.R' 'read_messages.R' 'reader.R' 'utilities.R' 'write_headers.R' 'write_messages.R' 'writer.R'

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

Date/Publication 2025-01-29 23:28:41 UTC

RemoteUrl https://github.com/grimbough/FITfileR

RemoteRef HEAD

RemoteSha 060d5286767b7e62cd2bb871c9d131d43ccea100

Contents

FitFile-accessors 2
FitFile-class 4
FITfileR 4
FitMessageHeader-class 5
FitMessages 5
readFitFile 6
readFitFileType 6

Index **8**

`FitFile-accessors` *Extracting messages from FIT Files*

Description

Methods for retrieving messages from `FitFile-class` objects.

Usage

```
listMessageTypes(fitFile)

## S4 method for signature 'FitFile'
listMessageTypes(fitFile)

getMessagesByType(fitFile, message_type)

## S4 method for signature 'FitFile,integer'
getMessagesByType(fitFile, message_type)

## S4 method for signature 'FitFile,character'
getMessagesByType(fitFile, message_type)

## S4 method for signature 'FitFile'
messages(fitFile)

file_id(fitFile)

## S4 method for signature 'FitFile'
file_id(fitFile)

records(fitFile)

## S4 method for signature 'FitFile'
records(fitFile)

laps(fitFile)
```

```
## S4 method for signature 'FitFile'
laps(fitFile)

events(fitFile)

## S4 method for signature 'FitFile'
events(fitFile)

hrv(fitFile)

## S4 method for signature 'FitFile'
hrv(fitFile)

monitoring(fitFile)

## S4 method for signature 'FitFile'
monitoring(fitFile)
```

Arguments

fitFile	A FitFile-class object.
message_type	Either an integer or character vector (length 1), specifying either a global message number or message type respectively.

Details

The FIT file specification allows for a large number of message types. FITfileR provides accessor methods for some of the most common. These include `records()` and `laps()`.

If a predefined function doesn't exist for the message type you want to extract, any message type can be retrieved with `getMessagesByType`. The second argument can take either the global message number (as specified in the FIT File definition) of message type you want, or the message name. A list of names for the message types held in a FitFile-class object can be retrieved with `listMessageTypes`.

The return type is dependant upon whether the FitFile-class contains multiple message definitions for the same message type. It is not uncommon for this to occur e.g. if a new sensor is added during an activity the *records* field definition will change. If there is a single definition for the message type a `tibble` will be returned, otherwise a `list` of `tibbles` is returned. The length of this `list` reflects the number of unique definitions for the message type within the file. It may be straightforward to combine these `tibbles` e.g. via `rbind`, but this is left to the user.

Value

Either a `tibble` or a `list` of `tibble`. See `details` for more information.

FitFile-class *An S4 class representing a FIT file*

Description

An S4 class representing a FIT file

Usage

```
## S4 method for signature 'FitFile'
length(x)
```

Arguments

x	An object of class FitFile.

Slots

header A list containing details of the file header

messages A list of FitDataMessages

developer_msg_defs A list of lists containing the definitions for any developer messages included in the file.

FITfileR *FITfileR: A package reading FIT files using native R code.*

Description

Provides functionality for reading FIT (Flexible and Interoperable Data Transfer) files without any dependence on external software or SDKs.

Author(s)

Maintainer: Mike Smith <grimbough@gmail.com> (ORCID)

See Also

Useful links:

- https://github.com/grimbough/FITfileR

`FitMessageHeader-class` *The* `FitMessageHeader` *class represents the single-byte header that precedes all FIT messages. It forms a part of all* `FitDefinitionMessage` *and* `FitDataMessage` *instances.*

Description

The `FitMessageHeader` class represents the single-byte header that precedes all FIT messages. It forms a part of all `FitDefinitionMessage` and `FitDataMessage` instances.

Slots

`is_defintion` Logical indicating if this is a definition message.

`has_developer_data` Logical defining whether the message contains developer data.

`local_message_number` The 'local' message number for this message type.

`time_offset` Numeric (length 1) giving the time offset for messages with compressed time stamps.

`raw_rep` Raw (length 1) matching the single byte that defined this message header. Used internally as a quick comparison to see if this is the same header as the previous message to speed up file reading.

`FitMessages` *S4 classes representing various aspects of FIT messages.*

Description

S4 classes representing various aspects of FIT messages.

The `FitDefinitionMessage` class represents definition messages.

The `FitDataMessage` class holds data messages.

The `FitDataMessageWithDevData` class extends `FitDataMessage` with additional slots to store the definitions of developer data fields that are not defined in the standard FIT file specification.

Slots

`global_message_number` A integer of length 1.

`field_definition` A data.frame.

`messages` A data.frame.

`header` An object of class `FitMessageHeader`.

`definition` An object of class `FitDefinitionMessage`.

`fields` A list containing the data encoded in this message.

readFitFile *Read a FIT file*

Description

Reads a specified FIT file and returns an object of class `FitFile`

Usage

```
readFitFile(fileName)
```

Arguments

`fileName`	A character specifying the FIT file to be read.

Value

An object of class `[FitFile-class]`

Examples

```
garmin_file <- system.file("extdata", "Activities", "garmin-edge530-ride.fit",
                           package = "FITfileR")
garmin <- readFitFile(garmin_file)
```

readFitFileType *Extract the type of FIT file*

Description

Quickly determine what type of FIT file you have without decoding all the data. Typically types include 'activity', 'workout' and 'course'. The full range of options is defined in the FIT file specification.

Usage

```
readFitFileType(fileName)
```

Arguments

`fileName`	A character specifying the FIT file to be read.

Value

As character vector of length 1. This will contain the text representation of the file type e.g. 'activity'

Examples

```
garmin_file <- system.file("extdata", "Activities", "garmin-edge530-ride.fit",
                           package = "FITfileR")
garmin <- readFitFileType(garmin_file)
```

Index

events *(FitFile-accessors)*, 2
events,FitFile-method *(FitFile-accessors)*, 2

file_id *(FitFile-accessors)*, 2
file_id,FitFile-method *(FitFile-accessors)*, 2
FitDataMessage, *4*
FitDataMessage-class *(FitMessages)*, 5
FitDataMessageWithDevData-class *(FitMessages)*, 5
FitDefinitionMessage-class *(FitMessages)*, 5
FitFile-accessors, 2
FitFile-class, 4
FITfileR, 4
FITfileR-package *(FITfileR)*, 4
FitMessageHeader-class, 5
FitMessages, 5

getMessagesByType *(FitFile-accessors)*, 2
getMessagesByType,FitFile,character-method *(FitFile-accessors)*, 2
getMessagesByType,FitFile,integer-method *(FitFile-accessors)*, 2

hrv *(FitFile-accessors)*, 2
hrv,FitFile-method *(FitFile-accessors)*, 2

laps *(FitFile-accessors)*, 2
laps,FitFile-method *(FitFile-accessors)*, 2
length,FitFile-method *(FitFile-class)*, 4
listMessageTypes *(FitFile-accessors)*, 2
listMessageTypes,FitFile-method *(FitFile-accessors)*, 2

messages,FitFile-method *(FitFile-accessors)*, 2
monitoring *(FitFile-accessors)*, 2
monitoring,FitFile-method *(FitFile-accessors)*, 2

rbind, *3*
readFitFile, 6
readFitFileType, 6
records *(FitFile-accessors)*, 2
records,FitFile-method *(FitFile-accessors)*, 2