

# Package ‘rroad’

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**Type** Package

**Title** Road Condition Analysis

**Version** 0.0.5

**Date** 2018-02-20

**Description** Computation of the International Roughness Index (IRI) given a longitudinal road profile. The IRI can be calculated for a single road segment or for a sequence of segments with a fixed length (e. g. 100m). For the latter, an overlap of the segments can be selected. The IRI and likewise the algorithms for its determination are defined in Sayers, Michael W; Gillespie, Thomas D; Queiroz, Cesar A.V. 1986. The International Road Roughness Experiment (IRRE) : establishing correlation and a calibration standard for measurements. World Bank technical paper; no. WTP 45. Washington, DC : The World Bank. (ISBN 0-8213-0589-1) available from <<http://documents.worldbank.org/curated/en/326081468740204115>>.

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**URL** <http://github.com/vsimko/rroad>

**BugReports** <http://github.com/vsimko/rroad/issues>

**LazyData** yes

**Suggests** testthat, knitr, zoo, biwavelet

**VignetteBuilder** knitr

**RoxygenNote** 6.0.1

**NeedsCompilation** no

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### CalculateIRIContinuously

*Computes the IRI for a continuously increasing segment given a road profile*

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#### Description

Depending on the sample size a certain buffer has to be attached to the profile for calculation the slope at the end.

#### Usage

```
CalculateIRIContinuously(profile, iri_coef)
```

#### Arguments

profile	Road profile (as numeric vector in mm) whose IRIs are to be calculated.
iri_coef	Set of coefficients for specific sample size (e. g. IRI_COEF_250).

#### Value

Calculated IRIs (m/km) for increasing segments (as numeric vector) of the given profile.

#### Examples

```
generate_test_profile <- function (x) {
  if (x < 1) return(0)
  if (x >= 1 && x < 3) return(x - 1)
  if (x >= 3 && x < 5) return(5 - x)
  if (x >= 5) return(0)
}
x <- seq(.25, 30, by = .25)
test_profile <- data.frame(x = x, profile=sapply(x, generate_test_profile))
test_profile$iri <- CalculateIRIContinuously(
  test_profile$profile, IRI_COEF_250)
plot(x = test_profile$x, y = test_profile$profile, ylim = c(0, 8),
     xlim = c(0,25), type = "l")
lines(x = test_profile$x, y = test_profile$iri*10)
```

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 CalculateIRIperSegments

*Computes the IRI for fixed length segments (e.g. 100m segments) given a road profile.*

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### Description

Computes the IRI for fixed length segments (e.g. 100m segments) given a road profile.

### Usage

```
CalculateIRIperSegments(profile, iri_coef, segment.length = 100)
```

### Arguments

`profile` Road profile (as numeric vector in mm) whose IRI is to be calculated.  
`iri_coef` Set of coefficients for specific sample size (e. g. IRI\_COEF\_100).  
`segment.length` Distance (in m) for which the IRI is to be calculated. Default is 100 m.

### Value

Calculated IRI (m/km) per segment (as numeric) of the given profile.

### Examples

```
profile <- rnorm(10000)
iri <- CalculateIRIperSegments(profile, IRI_COEF_100, 20)
par(mfrow = c(1,2))
plot(profile, type="l",
      xlab="Distance [dm]", ylab="Profile [m]",
      main="Read profile (Laser measurement)")
plot(iri, type="s",
      xlab="Segment", ylab="IRI [m/km]",
      main="International Roughness Index (IRI)\nsample = 10cm, segment = 20m")
```

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 CalculateIRIperSegmentsOverlapping

*Computes the IRI for fixed length overlapping segments (e.g. 100 m segments) with an offset (e.g. 20 m) given a road profile*

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### Description

Computes the IRI for fixed length overlapping segments (e.g. 100 m segments) with an offset (e.g. 20 m) given a road profile

**Usage**

```
CalculateIRIperSegmentsOverlapping(profile, iri_coef, segment.length = 100,
  segment.offset = 20)
```

**Arguments**

`profile` Road profile (as numeric vector in mm) whose IRI is to be calculated.  
`iri_coef` Set of coefficients for specific sample size (e. g. IRI\_COEF\_100).  
`segment.length` Distance (in m) for which the IRI is to be calculated. Default is 100 m.  
`segment.offset` Offset (in m) for which the segments will not overlap. Default is 20 m.

**Value**

Calculated IRI (m/km) per segment (as numeric) of the given profile.

**Examples**

```
profile <- rnorm(10000)
iri <- CalculateIRIperSegments(profile, IRI_COEF_100, 20)
par(mfrow = c(1,2))
plot(profile, type="l",
  xlab="Distance [dm]", ylab="Profile [m]",
  main="Read profile (Laser measurement)")
plot(iri, type="s",
  xlab="Segment (with 20 m offset)", ylab="IRI [m/km]",
  main="International Roughness Index (IRI)\nsample = 10cm, segment = 20m")
```

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IRI\_COEF\_100 *precomputed coefficients 100 mm segments (lazily evaluated promise)*

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**Description**

precomputed coefficients 100 mm segments (lazily evaluated promise)

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IRI\_COEF\_250 *precomputed coefficients 250 mm segments (lazily evaluated promise)*

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**Description**

precomputed coefficients 250 mm segments (lazily evaluated promise)

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