Package ‘VFPro’

October 31, 2017

**Version:** 0.1.0

**Date:** October 31, 2017

**Title:** Gaussian Mixture Model Expectation Maximization and Statistical Analysis (GEM) for glaucoma progression detection

**Description:** Detects glaucoma progression of the Eye using GEM Axes & Critical P-Value/Slope. This function requires at least 5 visits per eye.

**Type:**

**Depends:** R (>=3.4.1), csv, data.table, plyr, tools, input file in csv format and must have 52 eye data with minimum of 5 visits per eye including eye identification and visit identification (i.e. date or age).

**License:** *to be determined*

**URL:** *to be determined*

**BugReport:** *to be determined*

**LazyData:** true

**VignetteBuilder:** *to be determined*

**Imports:** *to be determined*

**Suggests:** *to be determined*

**RoxygenNote:** *to be determined*

**NeedsCompilation:** No

**Author:** Edward De Guzman

**Maintainer:** Edward De Guzman <[edeguzman2017@gmail.com](mailto:edeguzman2017@gmail.com)>

**Repository:** *to be determined*

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**R Topics documented:**

VFPro-package VFPro for glaucoma progression detection

Description

This R Package uses Gaussian Mixture Model and Expectation Maximization (GEM) to calculate for P-Values and Slope for each eye data (visits). Input eye data must have 52 different test points resulting from measurements of retinal sensitivity to light. These 52 data points are the total deviation (TD) ranging from -2 to 2. Linear Regression is calculated using GEM and the results (p-value & slope) are compared to critical p-value and critical slope. The progression of eye is identified when the results is less than the critical p-value and critical slope.

Author(s)

Edward De Guzman, Siamak Yousefi

References

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4254715/>

See Also

<https://cran.r-project.org/web/packages/visualFields/visualFields.pdf>

VFPro Calculates P-Value and Slope from eye data TD and identifies eye progressing to glaucoma using GEM Axes and Critical P-Value and Critical Slope.

Description

Function that calculates for P-Value and Slope of the eye data using Linear Regression using GEM and identifies if eye is progressing to glaucoma.

Usage

VFPro (eyedata.csv )

Arguments

eyedata.csv

* csv file containing the following format.
* Header (first row of the csv file)
  + Column A: IdEye
  + Column B: Age
  + Column C to BB: TD\_1 to TD\_52
* Data (succeeding rows)
  + Column A: Unique identification of the eye
  + Column B: Can be age or date of visit
  + Column C to BB: integer number indicating the total deviation (TD)

See attached sample csv format (vf\_lon\_sample.csv)

Value

Returns 4 different files:

* progressedresult.csv: This csv file shows the list of progressed eyes and when the first progression was detected
* resultdetail.csv: This csv file shows the detail results of linear regression (p-value & slope) for each eye applied to 20 rows from the GEM Axis. Selected critical p-value and critical slope were placed next the result to visualize if the computed p-value and slope are less than critical p-value and critical slope.
* gem.csv: This csv file shows the embedded GEM Axis used by the gemPro2 R Library.
* vectorAllEyes.csv: This csv files list of all eyes from the input file with corresponding value of 1 when eye is detected progressing to glaucoma and 0 for normal eye.

Authors

Edward De Guzman, Siamak Yousefi

Examples

VFPro (“C:\Temp\vf\_lon\_sample.csv”).