Package 'praatpicture'

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Title 'Praat Picture' Style Plots of Acoustic Data

Version 1.9.0

Description Quickly and easily generate plots of acoustic data aligned with transcriptions similar to those made in 'Praat' using either derived signals generated directly in R with 'wrassp' or imported derived signals from 'Praat'. Provides easy and fast out-of-the-box solutions but also a high extent of flexibility. Also provides options for embedding audio in figures and animating figures.

License Apache License (>= 2)

Encoding UTF-8

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`conv2sc` *Convert capital letters to Unicode small caps*

Description

Helper function to convert capital letters into Unicode small caps. May not work for all font families. Note that there's no Unicode small cap 'X', so 'X' will just be converted to 'x'.

Usage

```
conv2sc(x)
```

Arguments

`x`	A string where all capital letters should be converted to small caps.

Value

A string where all capital letters have been converted to small caps.

Examples

```
my_string <- 'ABCDEFGHIJKLMNOPQRSTUVWXYZ'
conv2sc(my_string)
```

draw_arrow *Draw arrow on praatpicture plot component*

Description

Helper function for drawing arrows on plot components made with praatpicture. Do not use directly, instead use praatpicture with the `draw_arrow` argument.

Usage

```
draw_arrow(plot_component, args)
```

Arguments

`plot_component`	String giving the name of the plot component to draw on.
`args`	A list of vectors giving arguments used for drawing arrows. See praatpicture documentation.

Value

No return values, called internally by praatpicture and sibling functions.

Examples

```
# Don't use directly
datapath <- system.file('extdata', package='praatpicture')
soundFile <- paste0(datapath, '/1.wav')
praatpicture(soundFile, draw_arrow=c('spectrogram', 0.1, 500, 0.4, 2000))
```

draw_lines *Draw straight lines on plot component*

Description

Helper function for adding straight lines to plot components made with praatpicture. Do not use directly, instead use praatpicture with the `draw_lines` argument.

Usage

```
draw_lines(plot_component, args)
```

Arguments

`plot_component`	String giving the name of the plot component to draw on.
`args`	A list of vectors giving arguments used for drawing straight lines. See praatpicture documentation.

Value

No return values, called internally by praatpicture and sibling functions.

Examples

```
# Don't use directly
datapath <- system.file('extdata', package='praatpicture')
soundFile <- paste0(datapath, '/1.wav')
praatpicture(soundFile, draw_lines=c('spectrogram',
h=seq(0,5000,by=1000), lty='dashed'))
```

---

draw_rectangle *Draw rectangle on praatpicture plot component*

Description

Helper function for drawing rectangles on plot components made with praatpicture. Do not use directly, instead use praatpicture with the `draw_rectangle` argument.

Usage

```
draw_rectangle(plot_component, args)
```

Arguments

`plot_component`	String giving the name of the plot component to draw on.
`args`	A list of vectors giving arguments used for drawing rectangles. See praatpicture documentation.

Value

No return values, called internally by praatpicture and sibling functions.

Examples

```
# Don't use directly
datapath <- system.file('extdata', package='praatpicture')
soundFile <- paste0(datapath, '/1.wav')
praatpicture(soundFile, draw_rectangle=c('spectrogram', 0.1, 500, 0.4, 2000))
```

draw_spectralslice *Draw spectral slice*

Description

Generate and plot spectral slice from window around a specified time point of a sound file.

Usage

```
draw_spectralslice(
  sound,
  time,
  channel = 1,
  freqRange = NULL,
  energyRange = 60,
  scale = "hz",
  method = "fft",
  multitaper_args = NULL,
  windowLength = 0.005,
  windowShape = "Gaussian",
  color = "black",
  lineWidth = 1,
  freq_axisLabel = NULL,
  energy_axisLabel = "Sound pressure level (dB/Hz)",
  mainTitle = "",
  mainTitleAlignment = 0,
  highlight = NULL,
  draw_lines = NULL,
  draw_rectangle = NULL,
  draw_arrow = NULL,
  annotate = NULL,
  ...
)
```

Arguments

sound	String giving the file name of a sound file with the .wav extension.
time	Time (in seconds) specifying the center of the window from which to estimate spectrum.
channel	Numeric giving the channel that should be used to generate the spectrogram. Default is 1.
freqRange	Vector of two numbers giving the frequency range to be used for plotting spectrograms. Default is NULL, in which case the whole spectrum is plotted using the Nyquist frequency for the upper limit.

energyRange — Either numeric or vector of two numbers used to specify the y-axis range in units of dB/Hz. If a single number is passed, this is interpreted as the desired dynamic range of the y-axis. If a vector of two numbers is passed, these are used to exactly delimit the y-axis. Default is `60`, i.e. a dynamic range of 60 dB/Hz relative to the global maximum.

scale — String giving the frequency scale to use. Default is `hz`. Alternatives are `erb` (for the equivalent rectangular bandwidth scale), `mel` (for the Mel scale, using 1000 Hz as the corner frequency, following Fant 1968), or `logarithmic` (for log Hz).

method — String specifying the spectral estimation. Default is `fft` (for the fast discrete Fourier transform). The only other option is `multitaper`, in which case multitaper::spec.mtm is used to generate the spectrum.

multitaper_args — Optional named list of arguments passed on to multitaper::spec.mtm if `method='multitaper'`.

windowLength — Window length in seconds for generating spectra. Default is `0.005`.

windowShape — String giving the name of the window shape to be applied to the signal when generating spectrograms. Default is `Gaussian`; other options are `square`, `Hamming`, `Bartlett`, `Hanning`, `Blackman`, or `Kaiser`.Note that the Gaussian window function provided by the `phonTools` package and used for this function does not have the same properties as the Gaussian window function used for spectral estimation in Praat.

color — String giving the name of the color to be used for plotting the spectrum. Default is `'black'`.

lineWidth — Number giving the line width to use for plotting the spectrum. Default is `1`.

freq_axisLabel — String giving the name of the label to print along the y-axis when plotting a spectrogram. Default is `NULL`, in which case the axis label will depend on the scale.

energy_axisLabel — String giving the name of the label to print along the y-axis. Default is `Sound pressure level (dB/Hz)`.

mainTitle — String giving a title to print at the top of the plot. The default is an empty string, i.e. no title.

mainTitleAlignment — Number indicating the vertical alignment of the plot title, where `0` (default) indicates left-alignment, `1` indicates right-alignment, `0.5` indicates central alignment, etc, following the conventions of the `adj` argument of graphics::mtext.

highlight — Named list giving parameters for differential highlighting of part of the plot based on the frequency domain. This list should contain information about which parts of the plot to highlight, done with the `start` and `end` arguments which must be numbers or numeric vectors. Further contains the optional arguments `color` (a string), `drawSize` (numeric), and `background` (a string specifying a background color).

draw_lines — Use for drawing straight lines. Takes an argument of type `list` which should contain arguments to pass on to graphics::abline. Should have a named argument `h` for horizontal lines, or `v` for vertical lines, or `a,b` for the intercept and slope of the line otherwise. Alternatively a nested list can be passed if more (sets of) lines should be drawn. Default is `NULL`.

draw_rectangle	Use for drawing rectangles. Should be a named list containing arguments to pass on to graphics::rect. Can also be multiple nested lists, if more rectangles should be drawn.
draw_arrow	Use for drawing arrows on plot components. Should be a named list containing arguments to pass on to graphics::arrows. Can also be multiple nested lists, if more rectangles should be drawn.
annotate	Use for annotating plot components. Should be a named list containing arguments to pass on tographics::text. Can also be multiple nested lists, if more annotations should be added.
...	Further global plotting arguments passed on to par().

Value

No return value, produces a figure.

Examples

```
datapath <- system.file('extdata', package='praatpicture')
soundFile <- paste0(datapath, '/1.wav')
draw_spectralslice(soundFile, time = 0.75)
```

---

emupicture *Make Praat Picture style plots in EMU*

Description

Generate plots in the style of Praat Pictures from sound files and annotations in an EMU database.

Usage

```
emupicture(
  db_handle,
  session = "0000",
  bundle,
  pitch_ssffExt = NULL,
  formant_ssffExt = NULL,
  intensity_ssffExt = NULL,
  talking = FALSE,
  ...
)
```

Arguments

db_handle	The handle of an EMU database loaded into R.
session	String giving the name of the session where the sound file to plot is located. Default is 0000.

bundle	String giving the name of the bundle with the sound file to plot.
pitch_ssffExt	String giving the file extension for an SSFF track with pitch data to plot. Default is NULL.
formant_ssffExt	String giving the file extension for an SSFF track with formant data to plot. Default is NULL.
intensity_ssffExt	String giving the file extension for an SSFF track with intensity data to plot. Default is NULL.
talking	Boolean; should a video be created with embedded audio, as when using talking_praatpicture? Default is FALSE.
...	Further arguments passed to praatpicture (or talking_praatpicture if talking = TRUE).

Value

No return value, produces a plot or a video.

See Also

See praatpicture for more details on how to customize plots and talking_praatpicture for more details on how to customize videos.

Examples

```
# Create demo data and load demo database
emuR::create_emuRdemoData(tempdir())
db_path <- paste0(tempdir(), '/emuR_demoData/ae_emuDB')
db <- emuR::load_emuDB(db_path)

emuR::list_bundles(db)
emupicture(db, bundle='msajc003', tg_tiers=c('Text', 'Tone'))

# Plot SSFF track data

emuR::list_ssffTrackDefinitions(db)
emupicture(db, bundle='msajc003', frames=c('sound', 'formant'),
proportion=c(30,70), formant_ssffExt='fms', formant_number=4)
```

---

formantplot *Plot formant object*

Description

Function for plotting formant objects called by praatpicture. Instead of using this function directly, just use praatpicture('my_sound_file', frames='formant').

Usage

```
formantplot(
  fm,
  start,
  end,
  tfrom0 = TRUE,
  tgbool = FALSE,
  lines = NULL,
  focusTierColor = "black",
  focusTierLineType = "dotted",
  dynamicRange = 30,
  freqRange = c(0, 5500),
  plotType = "speckle",
  color = "black",
  ind = NULL,
  min_max_only = FALSE,
  highlight = NULL,
  axisLabel = "Frequency (Hz)",
  drawSize = 1,
  speckleSize = 1,
  suppressAxes = FALSE
)
```

Arguments

`fm`	Formant object loaded using rPraat::formant.read or similar object, i.e. a `list` object containing the elements `t` (time), `frequencyArray` (array or formant frequencies with number of rows corresponding to the length of `t`), `maxnFormants` (integer giving the number of formants), `intensityVector` (vector of intensity values of the same length as `t`), and `conv2db` (logical).
`start`	Start time (in seconds) of desired plotted area.
`end`	End time (in seconds) of desired plotted area.
`tfrom0`	Logical; should time on the x-axis run from 0 or from the original time? Default is `TRUE`.
`tgbool`	Logical; should dotted lines be plotted corresponding to locations in a TextGrid? Default is `FALSE`.
`lines`	Numeric vector giving locations in seconds of locations from a TextGrid to be plotted with dotted lines. Default is `NULL`.
`focusTierColor`	String or vector of strings giving the color(s) to use for plotting focus tier lines. If multiple tiers are focused, a vector of the same length can be passed, and the nth tier will be plotted in the nth color. Default is `'black'`.
`focusTierLineType`	String or vector of strings giving the line type(s) for plotting focus tier lines. If multiple tiers are focused, a vector of the same length can be passed, and the nth tier will be plotted in the nth line type. Default is `'dotted'`.

dynamicRange	Dynamic range in dB for producing formant plots. When a formant plot of plotType='speckle' is drawn, no formants are shown in frames with intensity level dynamicRange below the maximum intensity. Default is 30. If set to 0, all formants are shown.
freqRange	Vector of two integers giving the frequency range to be used for producing formant plots. Default is c(0,5500).
plotType	String giving the type of formant plot to produce; default is speckle (a point plot), the only other option is draw (a line plot). Alternatively a vector c('draw','speckle') can be passed, in which case both are used.
color	String or vector of strings giving the name(s) of colors to be used for plotting formants. If one color is provided, all formants will be plotted in this color. If multiple colors are provided, different formants will be shown in different colors. Default is 'black'.
ind	Integer indexing formants relative to other plot components. Default is NULL.
min_max_only	Logical; should only minimum and maximum values be given on the y-axis? Default is FALSE. Can also be a logical vector if some but not all plot components should have minimum and maximum values on the y-axis. Ignored for TextGrid component.
highlight	Named list giving parameters for differential highlighting of formants based on the time domain. This list should contain information about which parts of the plot to highlight, either done with the start and end arguments which must be numbers or numeric vectors, or using the tier and label arguments to highlight based on information in a plotted TextGrid. Further contains the optional arguments color (string or vector of strings, see color), drawSize or speckleSize (both numeric), and background (a string specifying a background color). Can be nested lists to highlight different parts of a figure in different ways.
axisLabel	String giving the name of the label to print along the y-axis when plotting formants. Default is Frequency (Hz).
drawSize	Number indicating the line width if plotType is 'draw'. Default is 1. Controls the lwd argument of graphics::lines.
speckleSize	Number indicating the point size of if _plotType is 'speckle'. Default is 1. Controls the cex arguments of graphics::points.
suppressAxes	Should all axes and the box around plots be suppressed? Default is FALSE. Generally not recommended.

Value

No return values, called internally by praatpicture and sibling functions.

Examples

```
# Don't use directly
datapath <- system.file('extdata', package='praatpicture')
soundFile <- paste0(datapath, '/1.wav')
praatpicture(soundFile, frames='formant')
```

`intensityplot` *Plot intensity object*

Description

Function for plotting intensity objects called by praatpicture. Instead of using this function directly, just use `praatpicture('my_sound_file', frames='intensity')`.

Usage

```
intensityplot(
  it,
  start,
  end,
  tfrom0 = TRUE,
  tgbool = FALSE,
  lines = NULL,
  focusTierColor = "black",
  focusTierLineType = "dotted",
  range = NULL,
  color = "black",
  ind = NULL,
  min_max_only = TRUE,
  highlight = NULL,
  axisLabel = "Intensity (dB)",
  drawSize = 1,
  suppressAxes = FALSE
)
```

Arguments

`it`	IntensityTier object loaded using rPraat::it.read or other object formatted in a similar way, i.e. a `list` object containing the elements `t` (a vector of time values) and `i` (a vector of intensity values) of identical length.
`start`	Start time (in seconds) of desired plotted area.
`end`	End time (in seconds) of desired plotted area.
`tfrom0`	Logical; should time on the x-axis run from 0 or from the original time? Default is `TRUE`.
`tgbool`	Logical; should dotted lines be plotted corresponding to locations in a TextGrid? Default is `FALSE`.
`lines`	Numeric vector giving locations in seconds of locations from a TextGrid to be plotted with dotted lines. Default is `NULL`.
`focusTierColor`	String or vector of strings giving the color(s) to use for plotting focus tier lines. If multiple tiers are focused, a vector of the same length can be passed, and the nth tier will be plotted in the nth color. Default is `'black'`.

`focusTierLineType`
: String or vector of strings giving the line type(s) for plotting focus tier lines. If multiple tiers are focused, a vector of the same length can be passed, and the nth tier will be plotted in the nth line type. Default is `'dotted'`.

`range`
: Vector of two integers giving the intensity range to be used for producing intensity plots. Default is `NULL`, in which case the range is simply the minimum and maximum levels in the curve.

`color`
: String giving the name of the color to be used for plotting intensity. Default is `'black'`.

`ind`
: Integer indexing current plot frame relative to other plot components. Default is `NULL`.

`min_max_only`
: Logical; should only minimum and maximum values be given on the y-axis? Default is `TRUE`. Can also be a logical vector if some but not all plot components should have minimum and maximum values on the y-axis. Ignored for TextGrid component.

`highlight`
: Named list giving parameters for differential highlighting of the intensity contour based on the time domain. This list should contain information about which parts of the plot to highlight, either done with the `start` and `end` arguments which must be numbers or numeric vectors, or using the `tier` and `label` arguments to highlight based on information in a plotted TextGrid. Further contains the optional arguments `color` (string or vector of strings, see `color`) and `drawSize` (integer), and `background` (a string specifying a background color). Can be nested lists to highlight different parts of a figure in different ways.

`axisLabel`
: String giving the name of the label to print along the y-axis when plotting intensity. Default is `Intensity (dB)`.

`drawSize`
: Number indicating the line width of the intensity contour. Default is `1`. Controls the `lwd` argument of graphics::lines.

`suppressAxes`
: Should all axes and the box around plots be suppressed? Default is `FALSE`. Generally not recommended.

Value

No return values, called internally by praatpicture and sibling functions.

Examples

```
# Don't use directly
datapath <- system.file('extdata', package='praatpicture')
soundFile <- paste0(datapath, '/1.wav')
praatpicture(soundFile, frames='intensity')
```

`intensity_overlay` *Overlay intensity on plot frame*

Description

Function for overlaying intensity contour on another plot frame, viz. the waveform or spectrogram. Instead of using this function directly, just use `praatpicture('my_sound_file')` with `intensity_plotOnSpec` or `pitch_plotOnWave` set to `TRUE`.

Usage

```
intensity_overlay(
  it,
  bottomRange,
  topRange,
  start,
  org_start = 0,
  tfrom0 = TRUE,
  range = NULL,
  color = "black",
  ind = NULL,
  drawSize = 1,
  axisLabel = "Intensity (dB)",
  min_max_only = TRUE,
  highlight = NULL,
  pitch_overlay = FALSE,
  suppressAxes = FALSE
)
```

Arguments

`it`	IntensityTier object loaded using rPraat::it.read or other object formatted in a similar way, i.e. a `list` object containing the elements `t` (a vector of time values) and `i` (a vector of intensity values) of identical length.
`bottomRange`	Bottom y-axis range of the plot frame that intensity is plotted on.
`topRange`	Top y-axis range of the plot frame that intensity is plotted on.
`start`	Start time (in seconds) of desired plotted area.
`org_start`	Start time (in seconds) of desired plotted area in the original sound file.
`tfrom0`	Logical; should time on the x-axis run from 0 or from the original time? Default is `TRUE`.
`range`	Vector of two integers giving the intensity range to be used for producing intensity plots. Default is `NULL`, in which case the range is simply the minimum and maximum levels in the curve.
`color`	String giving the name of the color to be used for plotting intensity. Default is `'black'`.

ind	Integer indexing intensity relative to other plot components. Default is NULL.
drawSize	Number indicating the line width of the intensity contour. Default is 1. Controls the lwd argument of graphics::lines.
axisLabel	String giving the name of the label to print along the y-axis when plotting intensity. Default is Intensity (dB).
min_max_only	Logical; should only minimum and maximum values be given on the y-axis? Default is TRUE. Can also be a logical vector if some but not all plot components should have minimum and maximum values on the y-axis. Ignored for TextGrid component.
highlight	Named list giving parameters for differential highlighting of the intensity contour based on the time domain. This list should contain information about which parts of the plot to highlight, either done with the start and end arguments which must be numbers or numeric vectors, or using the tier and label arguments to highlight based on information in a plotted TextGrid. Further contains the optional arguments color (string or vector of strings, see color) and drawSize (integer), and background (a string specifying a background color). Can be nested lists to highlight different parts of a figure in different ways.
pitch_overlay	Logical; is pitch also overlaid on the same plot frame? Default is FALSE.
suppressAxes	Should all axes and the box around plots be suppressed? Default is FALSE. Generally not recommended.

Value

No return values, called internally by praatpicture and sibling functions.

Examples

```
# Don't use directly
datapath <- system.file('extdata', package='praatpicture')
soundFile <- paste0(datapath, '/1.wav')
praatpicture(soundFile, frames = 'spectrogram',
intensity_plotOnSpec = TRUE)
```

---

make_annot *Annotate praatpicture plot component*

Description

Helper function for annotating plot components made with praatpicture. Do not use directly, instead use praatpicture with the annotate argument.

Usage

```
make_annot(plot_component, args)
```

Arguments

plot_component	String giving the name of the plot component to annotate.
args	A list of vectors giving arguments used for annotating. See praatpicture documentation.

Value

No return values, called internally by praatpicture and sibling functions.

Examples

```
# Don't use directly
datapath <- system.file('extdata', package='praatpicture')
soundFile <- paste0(datapath, '/1.wav')
praatpicture(soundFile, annotate=c('spectrogram', 0.25, 1500,
'An annotation'))
```

---

make_TextGrid *Interactively create a TextGrid object*

Description

Annotate a sound file by interacting with waveform or spectrogram plots, resulting in a TextGrid object which can be used for creating various acoustic plots with time-aligned annotations with praatpicture().

Usage

```
make_TextGrid(
  sound,
  tierNames,
  start = 0,
  end = 0,
  audioInViewer = TRUE,
  show = "wave",
  channel = 1,
  sampa2ipa = FALSE
)
```

Arguments

sound	String giving the file name of a sound file with the .wav extension.
tierNames	String or vector of strings giving the name(s) of tiers in the new TextGrid object.
start	Start time (in seconds) of desired plotted area. Default is 0.
end	End time (in seconds) of desired plotted area. Default is 0 (= the entire file).
audioInViewer	Logical; should audio be playable from the Viewer pane in RStudio?

show	String giving the type of plot to show. Default is wave, another option is spectrogram. Note that spectrogram plotting is relatively slow within this function.
channel	Number indicating which audio channel to show. Default is 1.
sampa2ipa	Logical; should SAMPA transcriptions be converted to IPA? Default is FALSE.

Details

Running this function will show either a waveform or a spectrogram in a separate X11 graphics device window. Click on this figure in the locations where you want to add boundaries to your TextGrid objects. This should be done sequentially, starting with the first boundary along the time axis and ending with the last. It does not matter where on the y-axis you click.

Once you have indicated all the desired boundaries, you will be prompted in the R console to say whether the tier is an interval tier or a point tier by typing y (for interval tier) or n (for point tier). Subsequently you will be prompted in the console to write labels corresponding to each interval or point.

If you are creating a TextGrid with multiple tiers (i.e., if tierNames is longer than 1), this process will be repeated for all tiers.

Value

A list object identical to those created by rPraat::tg.read() when loading TextGrid objects into R. This object can be passed to the tg_obj argument when using praatpicture.

See Also

make_TextGrid() is largely a wrapper around the function tg_createTier() which does most of the work.

Examples

```
## Not run:
datapath <- system.file('extdata', package='praatpicture')
soundFile <- paste0(datapath, '/2.wav')
tg <- make_TextGrid(soundFile, tierNames=c('Mary', 'John', 'Bell'))
# Follow the steps shown in the console

praatpicture(soundFile, tg_obj=tg)

## End(Not run)
```

---

pitchplot *Plot pitch object*

Description

Function for plotting pitch objects called by praatpicture. Instead of using this function directly, just use praatpicture('my_sound_file', frames='pitch').

Usage

```
pitchplot(
  pt,
  start,
  end,
  tfrom0 = TRUE,
  tgbool = FALSE,
  lines = NULL,
  focusTierColor = "black",
  focusTierLineType = "dotted",
  plotType = "draw",
  scale = "hz",
  freqRange = NULL,
  semitonesRe = 100,
  color = "black",
  ind = NULL,
  min_max_only = TRUE,
  highlight = NULL,
  axisLabel = NULL,
  drawSize = 1,
  speckleSize = 1,
  suppressAxes = FALSE
)
```

Arguments

`pt`	PitchTier object loaded using rPraat::pt.read or other object formatted in a similar way, i.e. a `list` object containing the elements `t` (a vector of time values) and `f` (a vector of frequency values) of identical length.
`start`	Start time (in seconds) of desired plotted area.
`end`	End time (in seconds) of desired plotted area.
`tfrom0`	Logical; should time on the x-axis run from 0 or from the original time? Default is `TRUE`.
`tgbool`	Logical; should dotted lines be plotted corresponding to locations in a TextGrid? Default is `FALSE`.
`lines`	Numeric vector giving locations in seconds of locations from a TextGrid to be plotted with dotted lines. Default is `NULL`.
`focusTierColor`	String or vector of strings giving the color(s) to use for plotting focus tier lines. If multiple tiers are focused, a vector of the same length can be passed, and the nth tier will be plotted in the nth color. Default is `'black'`.
`focusTierLineType`	String or vector of strings giving the line type(s) for plotting focus tier lines. If multiple tiers are focused, a vector of the same length can be passed, and the nth tier will be plotted in the nth line type. Default is `'dotted'`.
`plotType`	String giving the type of pitch plot to produce; default is `draw` (a line plot), the only other option is `speckle` (a point plot). Alternatively a vector `c('draw','speckle')` can be passed, in which case both are used.

scale	String giving the frequency scale to use when producing pitch plots. Default is hz; other options are logarithmic (also in Hz), semitones, erb, and mel.
freqRange	Vector of two integers giving the frequency range to be used for producing pitch plots. Default is NULL, in which case the pitch range is automatically reset to c(-12,30) for the semitones scale, c(0,10) for the erb scale, and c(50,500) for the Hz-based scales, following Praat defaults.
semitonesRe	Frequency in Hz giving the reference level for converting pitch frequency to semitones. Default is 100.
color	String giving the name of the color to be used for plotting pitch. Default is 'black'.
ind	Integer indexing pitch relative to other plot components. Default is NULL.
min_max_only	Logical; should only minimum and maximum values be given on the y-axis? Default is TRUE. Can also be a logical vector if some but not all plot components should have minimum and maximum values on the y-axis. Ignored for TextGrid component.
highlight	Named list giving parameters for differential highlighting of pitch based on the time domain. This list should contain information about which parts of the plot to highlight, either done with the start and end arguments which must be numbers or numeric vectors, or using the tier and label arguments to highlight based on information in a plotted TextGrid. Further contains the optional arguments color (string or vector of strings, see color), drawSize or speckleSize (both numeric), and background (a string specifying a background color). Can be nested lists to highlight different parts of a figure in different ways.
axisLabel	String giving the name of the label to print along the y-axis when printing a pitch track. Default is NULL, in which case the axis label will depend on the scale.
drawSize	Number indicating the line width if plotType is 'draw'. Default is 1. Controls the lwd argument of graphics::lines.
speckleSize	Number indicating the point size of if _plotType is 'speckle'. Default is 1. Controls the cex arguments of graphics::points.
suppressAxes	Should all axes and the box around plots be suppressed? Default is FALSE. Generally not recommended.

Value

No return values, called internally by praatpicture and sibling functions.

Examples

```
# Don't use directly
datapath <- system.file('extdata', package='praatpicture')
soundFile <- paste0(datapath, '/1.wav')
praatpicture(soundFile, frames='pitch')
```

`pitch_overlay` *Overlay pitch on plot frame*

Description

Function for overlaying pitch contour on another plot frame, viz. the waveform or spectrogram. Instead of using this function directly, just use `praatpicture('my_sound_file')` with `pitch_plotOnSpec` or `pitch_plotOnWave` set to `TRUE`.

Usage

```
pitch_overlay(
  pt,
  bottomRange,
  topRange,
  start,
  org_start = 0,
  tfrom0 = TRUE,
  freqRange = NULL,
  plotType = "draw",
  scale = "hz",
  color = "black",
  ind = NULL,
  drawSize = 1,
  speckleSize = 1,
  axisLabel = NULL,
  min_max_only = TRUE,
  highlight = NULL,
  intensity_overlay = FALSE,
  suppressAxes = FALSE
)
```

Arguments

`pt`	PitchTier object loaded using rPraat::pt.read or other object formatted in a similar way, i.e. a `list` object containing the elements `t` (a vector of time values) and `f` (a vector of frequency values) of identical length.
`bottomRange`	Bottom y-axis range of the plot frame that pitch is plotted on.
`topRange`	Top y-axis range of the plot frame that pitch is plotted on.
`start`	Start time (in seconds) of desired plotted area.
`org_start`	Start time (in seconds) of desired plotted area in the original sound file.
`tfrom0`	Logical; should time on the x-axis run from 0 or from the original time? Default is `TRUE`.

freqRange	Vector of two integers giving the frequency range to be used for producing pitch plots. Default is NULL, in which case the pitch range is automatically reset to c(-12,30) for the semitones scale, c(0,10) for the erb scale, and c(50,500) for the Hz-based scales, following Praat defaults.
plotType	String giving the type of pitch plot to produce; default is draw (a line plot), the only other option is speckle (a point plot). Alternatively a vector c('draw','speckle') can be passed, in which case both are used.
scale	String giving the frequency scale to use when producing pitch plots. Default is hz; other options are logarithmic (also in Hz), semitones, erb, and mel.
color	String giving the name of the color to be used for plotting pitch. Default is 'black'.
ind	Integer indexing current plot frame relative to other plot components. Default is NULL.
drawSize	Number indicating the line width if plotType is 'draw'. Default is 1. Controls the lwd argument of graphics::lines.
speckleSize	Number indicating the point size of if _plotType is 'speckle'. Default is 1. Controls the cex arguments of graphics::points.
axisLabel	String giving the name of the label to print along the y-axis when printing a pitch track. Default is NULL, in which case the axis label will depend on the scale.
min_max_only	Logical; should only minimum and maximum values be given on the y-axis? Default is TRUE. Can also be a logical vector if some but not all plot components should have minimum and maximum values on the y-axis. Ignored for TextGrid component.
highlight	Named list giving parameters for differential highlighting of pitch based on the time domain. This list should contain information about which parts of the plot to highlight, either done with the start and end arguments which must be numbers or numeric vectors, or using the tier and label arguments to highlight based on information in a plotted TextGrid. Further contains the optional arguments color (string or vector of strings, see color), drawSize or speckleSize (both numeric), and background (a string specifying a background color). Can be nested lists to highlight different parts of a figure in different ways.
intensity_overlay	Logical; is intensity also overlaid on the same plot frame? Default is FALSE.
suppressAxes	Should all axes and the box around plots be suppressed? Default is FALSE. Generally not recommended.

Value

No return values, called internally by praatpicture and sibling functions.

Examples

```
# Don't use directly
datapath <- system.file('extdata', package='praatpicture')
soundFile <- paste0(datapath, '/1.wav')
praatpicture(soundFile, frames = 'spectrogram', pitch_plotOnSpec = TRUE)
```

praatanimation *Make animations from Praat Picture-style plots of acoustic data*

Description

Animate some aspect of a Praat Picture-style plot of acoustic data, potentially aligned with transcriptions.

Usage

```
praatanimation(
  sound,
  width = 1080,
  height = 720,
  frameRate = 24,
  n_frames = 50,
  loop = TRUE,
  outputFile = NULL,
  outputFormat = "gif",
  useViewer = TRUE,
  verbose = TRUE,
  pointsize = 25,
  start = 0,
  end = 0,
  spec_freqRange = c(0, 5000),
  spec_windowLength = 0.005,
  spec_dynamicRange = 50,
  spec_timeStep = 1000,
  pitch_timeStep = NULL,
  pitch_floor = 50,
  pitch_ceiling = 600,
  pitch_freqRange = c(50, 500),
  pitch_semitonesRe = 100,
  formant_timeStep = NULL,
  formant_windowLength = 0.025,
  formant_dynamicRange = 30,
  formant_freqRange = c(50, 5500),
  intensity_timeStep = NULL,
  intensity_minPitch = 100,
  intensity_range = NULL,
  ...
)
```

Arguments

sound	String giving the file name of a sound file with the .wav extension.

`width` Number giving the desired width of the resulting animation in pixels; default is `1080`.

`height` Number giving the desired height of the resulting animation in pixels; default is `720`.

`frameRate` Number giving the desired frame rate of the resulting animation in Hz; default is `24`, i.e. 24 frames per second.

`n_frames` Number giving the desired number of frames of the resulting animation; default is `50`.

`loop` Logical; should the animation be looped? Default is `TRUE`. Ignored when `outputType` is `mp4`.

`outputFile` String giving the desired file name of the animation. Default is `NULL`, in which case GIF files are named `praatgif.gif` and MP4 files are named `praatvid.mp4`. If you choose a different name, make sure that the file extension matches the selected `outputType`.

`outputFormat` String giving the desired file type; default is `gif`, the only other option is `mp4`.S

`useViewer` Logical; should the animation be shown in the Viewer pane in RStudio? Default is `TRUE`; if true, the animation is only saved in a temporary directory, but can be downloaded from a browser.

`verbose` Logical; should status messages be printed in the console as figures are being generated? Default is `TRUE`.

`pointsize` Number; which point size should be used for text in the animation? Default is `25`. See `grDevices::png()` for more details.

`start` Start time (in seconds) of desired plotted area. Default is `0`. Alternatively, a vector giving the first and last start time in the animation.

`end` End time (in seconds) of desired plotted area. Default is `0` (= the entire file). Alternatively, a vector giving the first and last end time in the animation.

`spec_freqRange` Vector of two integers giving the frequency range to be used for plotting spectrograms. Default is `c(0,5000)`. Alternatively, a vector of four integers giving the first and last lowest frequency, followed by the first and last highest frequency in the animation; i.e., `c(0,0,5000,10000)` will produce an animation where the upper frequency boundary gradually increases from 5000 Hz to 10,000 Hz.

`spec_windowLength` Window length in seconds for generating spectrograms. Default is `0.005`. Alternatively, a vector giving the first and last window lengths in the animation.

`spec_dynamicRange` Dynamic range in dB for generating spectrograms. The maximum intensity minus `spec_dynamicRange` will all be printed in white. Default is `50`. Alternatively, a vector giving the first and last dynamic range values in the animation.

`spec_timeStep` How many time steps should be calculated for spectrograms? Default is `1000`. Alternatively, a vector giving the first and last time step values in the animation.

`pitch_timeStep` Measurement interval in seconds for tracking pitch. Default is `NULL`, in which case the measurement interval is equal to 0.75 / `pitch_floor`. Alternatively, a vector giving the first and last measurement intervals in the animation.

`pitch_floor` Frequency in Hz; no pitch candidates considered below this frequency. Default is `75`. Alternatively, a vector giving the first and last pitch floors to be used in the animation.

`pitch_ceiling` Frequency in Hz; no pitch candidates considered above this frequency. Default is `600`. Alternatively, a vector giving the first and last pitch ceilings to be used in the animation.

`pitch_freqRange`
Vector of two integers giving the frequency range to be used for producing pitch plots. Default is `c(50,500)`. If the frequency scales `semitones` or `erb` are used, the pitch range is automatically reset to the Praat defaults for these scales (`c(-12,30)` and `c(0,10)`, respectively). Alternatively, a vector of four integers giving the first and last lowest frequency, followed by the first and last highest frequency in the animation (see `spec_freqRange` for usage details).

`pitch_semitonesRe`
Frequency in Hz giving the reference level for converting pitch frequency to semitones. Default is `100`. Alternatively, a vector giving the first and last semitone reference levels to be used in the animation.

`formant_timeStep`
Measurement interval in seconds for tracking formants. Default is `NULL`, in which case the measurement interval is equal to `formant_windowLength` / 4. Alternatively, a vector giving the first and last measurement intervals to be used in the animation.

`formant_windowLength`
The effective duration of the analysis window used for tracking formants in seconds; the actual duration of the analysis window is twice this value. Alternatively, a vector giving the first and last window lengths to be used in the animation.

`formant_dynamicRange`
Dynamic range in dB for producing formant plots. When a formant plot of `formant_plotType='speckle'` is drawn, no formants are shown in frames with intensity level `formant_dynamicRange` below the maximum intensity. Default is `30`. If set to `0`, all formants are shown. Alternatively, a vector giving the first and last dynamic range levels to be used in the animation.

`formant_freqRange`
Vector of two integers giving the frequency range to be used for producing formant plots. Default is `c(0,5500)`. Alternatively, a vector of four integers giving the first and last lowest frequency, followed by the first and last highest frequency in the animation (see `spec_freqRange` for usage details).

`intensity_timeStep`
Measurement interval in seconds for tracking intensity. Default is `NULL`, in which case the measurement interval is equal to 0.8 * `intensity_minPitch`. Alternatively, a vector giving the first and last measurement intervals to be used in the animation.

`intensity_minPitch`
Lowest pitch in Hz used when calculating intensity; default is `100`. Alternatively, a vector giving the first and last minimum pitch levels to be used in the animation.

intensity_range
: Vector of two integers giving the intensity range to be used for producing intensity plots. Default is NULL, in which case the range is simply the minimum and maximum levels in the curve. Alternatively, a vector of four integers giving the first and last lowest level, followed by the first and last highest level in the animation (see spec_freqRange for usage details).

...
: Further arguments passed to praatpicture.

Value

No return value, produces an animated figure.

See Also

This function is a wrapper for either gifski::save_gif() or av::av_capture_graphics() used to produce animations based on praatpicture(). For more detail on your options, see the praatpicture() help file.

Examples

```
## Not run:
datapath <- system.file('extdata', package='praatpicture')
soundFile <- paste0(datapath, '/1.wav')

# Show increasing frequency range
praatanimation(soundFile, spec_freqRange=c(0,0,4000,12000))

# Transition from narrowband to broadband spectrogram
praatanimation(soundFile, spec_windowLength=c(0.005,0.03))

# Etc.

## End(Not run)
```

---

praatpicture *Make Praat Picture style plots of acoustic data*

Description

Generate plots of acoustic data aligned with transcriptions similar to those made with Praat Picture. The default is to produce a plot with a relatively small waveform, somewhat larger spectrogram, and the first tier of a TextGrid.

Usage

```
praatpicture(
  sound,
  start = 0,
  end = 0,
```

```
tfrom0 = TRUE,
tUnit = "s",
frames = c("sound", "spectrogram", "TextGrid"),
proportion = c(30, 50, 20),
mainTitle = "",
mainTitleAlignment = 0,
start_end_only = TRUE,
min_max_only = TRUE,
drawSize = 1,
speckleSize = 1,
wave_channels = "all",
wave_channelNames = FALSE,
wave_energyRange = NULL,
wave_axisDigits = 3,
wave_color = "black",
wave_lineWidth = 1,
wave_highlight = NULL,
tg_obj = NULL,
tg_file = NULL,
tg_tiers = "all",
tg_focusTier = tg_tiers[1],
tg_focusTierColor = "black",
tg_focusTierLineType = "dotted",
tg_tierNames = TRUE,
tg_alignment = "central",
tg_edgeLabels = "keep",
tg_specialChar = FALSE,
tg_color = "black",
tg_highlight = NULL,
spec_channel = NULL,
spec_scale = "hz",
spec_freqRange = NULL,
spec_windowLength = 0.005,
spec_dynamicRange = 50,
spec_timeStep = 1000,
spec_windowShape = "Gaussian",
spec_colors = c("white", "black"),
spec_axisLabel = NULL,
spec_highlight = NULL,
pitch_timeStep = NULL,
pitch_floor = 75,
pitch_ceiling = 600,
pitch_plotType = "draw",
pitch_scale = "hz",
pitch_freqRange = NULL,
pitch_semitonesRe = 100,
pitch_color = "black",
pitch_plotOnSpec = FALSE,
```

```
  pitch_plotOnWave = FALSE,
  pitch_ssff = NULL,
  pitch_axisLabel = NULL,
  pitch_highlight = NULL,
  formant_timeStep = NULL,
  formant_maxN = 5,
  formant_windowLength = 0.025,
  formant_dynamicRange = 30,
  formant_freqRange = c(50, 5500),
  formant_number = NULL,
  formant_plotType = "speckle",
  formant_color = "black",
  formant_plotOnSpec = FALSE,
  formant_ssff = NULL,
  formant_axisLabel = "Frequency (Hz)",
  formant_highlight = NULL,
  intensity_timeStep = NULL,
  intensity_minPitch = 100,
  intensity_range = NULL,
  intensity_color = "black",
  intensity_plotOnSpec = FALSE,
  intensity_plotOnWave = FALSE,
  intensity_ssff = NULL,
  intensity_axisLabel = "Intensity (dB)",
  intensity_highlight = NULL,
  time_axisLabel = NULL,
  highlight = NULL,
  suppressAxes = FALSE,
  draw_lines = list("formant", h = seq(0, 10000, by = 1000), lty = "dotted"),
  draw_rectangle = NULL,
  draw_arrow = NULL,
  annotate = NULL,
  gender = "u",
  ...
)
```

Arguments

sound	String giving the file name of a sound file with the .wav extension.
start	Start time (in seconds) of desired plotted area. Default is 0.
end	End time (in seconds) of desired plotted area. Default is 0 (= the entire file).
tfrom0	Logical; should time on the x-axis run from 0 or from the original time? Default is TRUE.
tUnit	String giving the unit of time to print along the x-axis. Possible options are 's' (default) for seconds and 'ms' for milliseconds.
frames	String or vector of strings giving the frames that the plot should consist of. Default is sound, spectrogram, TextGrid. This requires a file with the extension

.TextGrid and the same base name as the sound file. Other options are pitch, formant, and intensity. See details for more information.

proportion — Integer or vector of integers of the same size as frames giving the proportion in percents of the plotting area to be taken up by the individual frames. Default is c(30,50,20). If more or less than three frames are plotted and no proportions are given, frames will be of equal size.

mainTitle — String giving a title to print at the top of the plot. The default is an empty string, i.e. no title.

mainTitleAlignment — Number indicating the vertical alignment of the plot title, where 0 (default) indicates left-alignment, 1 indicates right-alignment, 0.5 indicates central alignment, etc, following the conventions of the adj argument of graphics::mtext.

start_end_only — Logical; should there only be ticks on the x-axis for start and end times? Default is TRUE.

min_max_only — Logical; should only minimum and maximum values be given on the y-axis? Default is TRUE. Can also be a logical vector if some but not all plot components should have minimum and maximum values on the y-axis. Ignored for TextGrid component.

drawSize — Number indicating the line width of plot components where the _plotType is 'draw' (i.e., pitch, formants, or intensity rendered as line plots). Default is 1. Controls the lwd argument of graphics::lines.

speckleSize — Number indicating the point size of plot components where the _plotType is 'speckle' (i.e. pitch or formants rendered as point plots). Default is 1. Controls the cex arguments of graphics::points.

wave_channels — Vector of numbers or strings giving either numeric identifiers of audio channels to plot of the names of audio channels to plot. Also understands 'all', which plots all channels and is the default.

wave_channelNames — Should names of audio channels be printed on the y-axis? If TRUE, names will be grabbed from the audio metadata if available. Alternatively, if two channels are available, they will be named left and right. If more or less than two channels are available, channels are named Cn, where n is the number of the channel. Alternatvely, a vector of strings can be provided with channel names. Default is FALSE.

wave_energyRange — Numeric vector giving the desired energy range (y-axis range) of waveform(s). Default is NULL, in which case the y-axis range is set to the lowest and highest value for each wave. If a vector of two values is passed for a multi-wave plot, these are recycled for each wave. Separate ranges can be set for each waveform by passing a vector of a length corresponding to twice the number of waves plotted.

wave_axisDigits — Numeric giving the number of digits to print for values along the y-axis of the waveform. Default is 3. If 0 is passed, the y-axis is suppressed. Alternatively a vector of numbers, if different numbers should be used for different channels. Note that this only applies when min_max_only = TRUE, as otherwise the look of the y-axis is determined entirely using grDevices::axisTicks().

wave_color — String giving the name of the color to be used for plotting the waveform. Default is 'black'. Alternatively a vector of strings, if different colors should be used for different channels.

wave_lineWidth — Number giving the line width to use for plotting the waveform. Default is 1. Alternatively a vector of numbers, if different line widths should be used for different channels.

wave_highlight — Named list giving parameters for differential highlighting of the waveform based on the time domain. This list should contain information about which parts of the plot to highlight, either done with the start and end arguments which must be numbers or numeric vectors, or using the tier and label arguments to highlight based on information in a plotted TextGrid. Further contains the argument color (string, see wave_color), and background (a string specifying a background color). Can be nested lists to highlight different parts of a figure in different ways.

tg_obj — A TextGrid object returned by the make_TextGrid() function.

tg_file — Path of file to be used for plotting TextGrid. Default is NULL, in which case the function searches for a TextGrid sharing the same base name as sound with the .TextGrid extension.

tg_tiers — Vector of numbers or strings giving either numeric identifiers of TextGrid tiers to plot or the names of TextGrid tiers to plot. Also understands 'all', which plots all tiers and is the default.

tg_focusTier — For which tier(s) should lines be shown on all acoustic plots giving the locations of boundaries? Vector of number or strings giving either numeric identifiers of TextGrid tiers or the names of TextGrid tiers to plot. Default is tg_tiers[1], i.e. the first tier given in the tg_tiers argument. Additionally accepts the string none, in which case no lines are shown on acoustic plots, and all, in which case lines from all tiers are shown on acoustic plots.

tg_focusTierColor — String or vector of strings giving the color(s) to use for plotting focus tier lines. If multiple tiers are focused, a vector of the same length can be passed, and the nth tier will be plotted in the nth color. Default is 'black'.

tg_focusTierLineType — String or vector of strings giving the line type(s) for plotting focus tier lines. If multiple tiers are focused, a vector of the same length can be passed, and the nth tier will be plotted in the nth line type. Default is 'dotted'.

tg_tierNames — Logical; should TextGrid tier names be printed along the y-axis? Default is TRUE.

tg_alignment — String giving the desired alignment of text in the TextGrids. Default is central; other options are left and right. Alternatively, a vector of strings if different alignments are needed.

tg_edgeLabels — String specifying how to handle TextGrid labels in interval tiers that fall partially before start or partially after end. Default is 'keep', where labels are kept at the center of the interval. Other options are 'center', where labels are recentered to the visible part of the interval, or 'discard', where such labels are ignored.

tg_specialChar Logical; should Praat typesetting for special font types such as italic, bold, and small caps be converted into corresponding R-readable special font types. Default is FALSE, since special characters can create unfortunate text alignment artefacts. See https://www.fon.hum.uva.nl/praat/manual/Text_styles.html.

tg_color String or vector of strings giving the name of the color(s) to be used for the text in TextGrids. Default is 'black'. If a vector is provided, different colors are used for different tiers.

tg_highlight Named list giving parameters for differential highlighting of TextGrid intervals. This list should contain information about which intervals to highlight, using the tier and label. Further contains the argument color, and background (a string specifying a background color). Can be nested lists to highlight different parts of a figure in different ways.

spec_channel Numeric giving the channel that should be used to generate the spectrogram. Default is 1. Generating spectrograms from multiple channels is not currently possible with praatpicture.

spec_scale String giving the frequency scale to use for plotting spectrograms. Default is hz. Alternatives are erb (for the equivalent rectangular bandwidth scale), mel (for the Mel scale, using 1000 Hz as the corner frequency, following Fant 1968), or logarithmic (for log Hz).

spec_freqRange Vector of two integers giving the frequency range to be used for plotting spectrograms. Default is NULL, in which case suitable ranges are chosen based on the frequency scale. For hz, the default is c(0,5000); for erb, the default is c(0.8,42); for mel, the default is c(30,4400). The latter two correspond roughly to the human auditory frequency response.

spec_windowLength
Window length in seconds for generating spectrograms. Default is 0.005.

spec_dynamicRange
Dynamic range in dB for generating spectrograms. The maximum intensity minus spec_dynamicRange will all be printed in white. Default is 50.

spec_timeStep How many time steps should be calculated for spectrograms? Default is 1000.

spec_windowShape
String giving the name of the window shape to be applied to the signal when generating spectrograms. Default is Gaussian; other options are square, Hamming, Bartlett, Hanning, or Blackman. Note that the Gaussian window function provided by the phonTools package and used in praatpicture() does not have the same properties as the Gaussian window function used for spectral estimation in Praat; plotting a simple sine wave with high dynamic range will produce sidelobes in praatpicture() but not in Praat. It's recommended to use Blackman windows instead if you have this problem.

spec_colors Vector of strings giving the names of colors to be used for plotting the spectrogram; default is c('white', 'black'). The first value is used for plotting the lowest visible amplitude, and the last for plotting the highest visible amplitude. Vectors with more than two color names can be used for plotting values in between in different colors.

spec_axisLabel String giving the name of the label to print along the y-axis when plotting a spectrogram. Default is NULL, in which case the axis label will depend on the scale.

spec_highlight Named list giving parameters for differential highlighting of the spectrogram based on the time domain. This list should contain information about which parts of the plot to highlight, either done with the start and end arguments which must be numbers or numeric vectors, or using the tier and label arguments to highlight based on information in a plotted TextGrid. Further contains the argument colors (vector of strings, see spec_colors). Can be nested lists to highlight different parts of a figure in different ways.

pitch_timeStep Measurement interval in seconds for tracking pitch. Default is NULL, in which case the measurement interval is equal to 0.75 / pitch_floor.

pitch_floor Frequency in Hz; no pitch candidates considered below this frequency. Default is 75.

pitch_ceiling Frequency in Hz; no pitch candidates considered above this frequency. Default is 600.

pitch_plotType String giving the type of pitch plot to produce; default is draw (a line plot), the only other option is speckle (a point plot). Alternatively a vector c('draw','speckle') can be passed, in which case both are used.

pitch_scale String giving the frequency scale to use when producing pitch plots. Default is hz; other options are logarithmic (also in Hz), semitones, erb, and mel.

pitch_freqRange
Vector of two integers giving the frequency range to be used for producing pitch plots. Default is NULL, in which case the pitch range is automatically reset to c(-12,30) for the semitones scale, c(0,10) for the erb scale, and c(50,500) for the Hz-based scales, following Praat defaults.

pitch_semitonesRe
Frequency in Hz giving the reference level for converting pitch frequency to semitones. Default is 100.

pitch_color String giving the name of the color to be used for plotting pitch. Default is 'black'. If pitch_plotOnSpec=TRUE, axes will follow the same color scheme. Also if pitch_plotOnSpec=TRUE, a vector of two strings can be passed, in which case the second color is used for background highlighting.

pitch_plotOnSpec
Boolean; should pitch be plotted on top of spectrogram? Default is FALSE.

pitch_plotOnWave
Boolean; should pitch be plotted on top of waveform? Default is FALSE.

pitch_ssff An object of class AsspDataObj containing a pitch track. Default is NULL.

pitch_axisLabel
String giving the name of the label to print along the y-axis when printing a pitch track. Default is NULL, in which case the axis label will depend on the scale. If pitch_plotOnSpec=TRUE, this label will be printed on the right-hand y-axis label.

pitch_highlight
Named list giving parameters for differential highlighting of pitch based on the time domain. This list should contain information about which parts of the plot to highlight, either done with the start and end arguments which must be numbers or numeric vectors, or using the tier and label arguments to highlight

based on information in a plotted TextGrid. Further contains the optional arguments `color` (string or vector of strings, see `pitch_color`), `drawSize` or `speckleSize` (both numeric), and `background` (a string specifying a background color). Can be nested lists to highlight different parts of a figure in different ways.

`formant_timeStep`
: Measurement interval in seconds for tracking formants. Default is `NULL`, in which case the measurement interval is equal to `formant_windowLength / 4`.

`formant_maxN`
: Integer giving the maximum number of formants to track. Default is `5`.

`formant_windowLength`
: The effective duration of the analysis window used for tracking formants in seconds; the actual duration of the analysis window is twice this value.

`formant_dynamicRange`
: Dynamic range in dB for producing formant plots. When a formant plot of `formant_plotType='speckle'` is drawn, no formants are shown in frames with intensity level `formant_dynamicRange` below the maximum intensity. Default is `30`. If set to `0`, all formants are shown.

`formant_freqRange`
: Vector of two integers giving the frequency range to be used for producing formant plots. Default is `c(0,5500)`.

`formant_number`
: Number of formants to plot. Default is `NULL`, in which case all available formants are plotted.

`formant_plotType`
: String giving the type of formant plot to produce; default is `speckle` (a point plot), the only other option is `draw` (a line plot). Alternatively a vector `c('draw','speckle')` can be passed, in which case both are used.

`formant_color`
: String or vector of strings giving the name(s) of colors to be used for plotting formants. If one color is provided, all formants will be plotted in this color. If multiple colors are provided, different formants will be shown in different colors. Default is `'black'`. If `formant_plotOnSpec=TRUE` and the length of this vector twice the number of formants plotted, the first half of strings will be used for the formants' primary colors and the second half will be used for background highlighting. If the length of this vector is one more than the number of formants plotted, the last string will be used for background highlighting.

`formant_plotOnSpec`
: Boolean; should formants be plotted on top of spectrogram? Default is `FALSE`.

`formant_ssff`
: An object of class `AsspDataObj` containing formant tracks. Default is `NULL`.

`formant_axisLabel`
: String giving the name of the label to print along the y-axis when plotting formants. Default is `Frequency (Hz)`.

`formant_highlight`
: Named list giving parameters for differential highlighting of formants based on the time domain. This list should contain information about which parts of the plot to highlight, either done with the `start` and `end` arguments which must be numbers or numeric vectors, or using the `tier` and `label` arguments to highlight based on information in a plotted TextGrid. Further contains the optional

arguments color (string or vector of strings, see formant_color), drawSize or speckleSize (both numeric), and background (a string specifying a background color). Can be nested lists to highlight different parts of a figure in different ways.

intensity_timeStep
: Measurement interval in seconds for tracking intensity. Default is NULL, in which case the measurement interval is equal to 0.8 * intensity_minPitch.

intensity_minPitch
: Lowest pitch in Hz used when calculating intensity; default is 100

intensity_range
: Vector of two integers giving the intensity range to be used for producing intensity plots. Default is NULL, in which case the range is simply the minimum and maximum levels in the curve.

intensity_color
: String giving the name of the color to be used for plotting intensity. Default is 'black'. If intensity_plotOnSpec=TRUE, axes will follow the same color scheme. Also if intensity_plotOnSpec=TRUE, a vector of two strings can be passed, in which case the second color is used for background highlighting.

intensity_plotOnSpec
: Boolean; should intensity be plotted on top of spectrogram? Default is FALSE.

intensity_plotOnWave
: Boolean; should intensity be plotted on top of waveform? Default is FALSE.

intensity_ssff
: An object of class AsspDataObj containing intensity tracks. Default is NULL.

intensity_axisLabel
: String giving the name of the label to print along the y-axis when plotting intensity. Default is Intensity (dB). If intensity_plotOnSpec=TRUE, this label will be printed on the right-hand y-axis label.

intensity_highlight
: Named list giving parameters for differential highlighting of the intensity contour based on the time domain. This list should contain information about which parts of the plot to highlight, either done with the start and end arguments which must be numbers or numeric vectors, or using the tier and label arguments to highlight based on information in a plotted TextGrid. Further contains the optional arguments color (string or vector of strings, see intensity_color) and drawSize (integer), and background (a string specifying a background color). Can be nested lists to highlight different parts of a figure in different ways.

time_axisLabel
: String giving the name of the label to print along the x-axis. Default is NULL, in which case Time (s) is printed if tUnit = 's' and Time (ms) is printed if tUnit = 'ms'.

highlight
: Named list giving parameters for differential highlighting of part of the plot based on the time domain. This list should contain information about which parts of the plot to highlight, either done with the start and end arguments which must be numbers or numeric vectors, or using the tier and label arguments to highlight based on information in a plotted TextGrid. Further contains the optional arguments color (a string), drawSize and speckleSize (both numeric), and background (a string specifying a background color). Can be nested

lists to highlight different parts of a figure in different ways. This argument is used to highlight all plot components, use the `*_highlight` arguments for highlighting individuals plot components.

`suppressAxes` Should all axes and the box around plots be suppressed? Default is `FALSE`. Generally not recommended.

`draw_lines` Use for drawing straight lines on plot components. Takes an argument of type `list` which should contain a) a string giving the plot component to draw straight lines on, and b) arguments to pass on to graphics::abline. Should have a named argument `h` for horizontal lines, or `v` for vertical lines, or `a,b` for the intercept and slope of the line otherwise. Alternatively a nested list can be passed if more (sets of) lines should be drawn. If multiple audio channels are plotted and lines should be added to one of these, use the channel identifier instead of a string giving the frame to draw on. The default value is `list('formant', h=seq(0,10000,by=1000), lty='dotted')`. According to Praat defaults, this means that if formants are plotted in a separate frame, horizontal dotted lines (`lty`) are shown at 1000 Hz intervals. To override this behavior, simply pass `draw_lines=NULL`.

`draw_rectangle` Use for drawing rectangles on plot components. A vector containing a) a string giving the plot component to draw a rectangle on, and b) arguments to pass on to graphics::rect. Alternatively a list of such vectors, if more rectangles should be drawn. If multiple audio channels are plotted and a rectangle should be added to one of these, use the channel identifier instead of a string giving the frame to draw on.

`draw_arrow` Use for drawing arrows on plot components. A vector containing a) a string giving the plot component to draw an arrow on, and b) arguments to pass on to graphics::arrows. Alternatively a list of such vectors, if more arrows should be drawn. If multiple audio channels are plotted and an arrow should be added to one of these, use the channel identifier instead of a string giving the frame to draw on.

`annotate` Use for annotating plot components. A vector containing a) a string giving the plot component to annotate, and b) arguments to pass on to graphics::text. Alternatively a list of such vectors, if more annotations should be made. If multiple audio channels are plotted and annotations should be added to one of these, use the channel identifier instead of a string giving the frame to draw on.

`gender` String indicating the gender of the speaker; default is `u` for unknown, other legal values are `m` and `f`. Used to tweak pitch and formant tracking parameters.

`...` Further global plotting arguments passed on to `par()`.

Details

When available, pitch, formant, and intensity tracks are loaded from Praat files with the same base name as `sound`; i.e., if your sound file is called `1.wav` and there is a Praat file called `1.Formant` in the same directory, this file is used for plotting formants. Pitch files should have either the `PitchTier` or `Pitch` extension, and intensity files should have the `IntensityTier` extension.

If no such files are available, the signal processing tools in the `wrassp` package are used; pitch is tracked with the function wrassp::ksvF0, formants are tracked with wrassp::forest, and intensity is

tracked with wrassp::rmsana. Parameters are set to mimic Praat as closely as possible, e.g. using a Gaussian-like window shape `KAISER2_0`, but results will differ from Praat simply because the tracking algorithms differ; as far as I know, the Burg algorithm used by Praat for tracking formants isn't implemented in R, nor is the autocorrelation method for tracking pitch.

Spectrograms are generated with the function phonTools::spectrogram. The code portion that actually adds the spectrogram to a plot is based on phonTools::plot.spectrogram but rewritten to use a bitmap raster for rendering the image if the graphics device allows for it, which significantly speeds up rendering the spectrogram.

Value

No return value, produces a figure.

Examples

```
datapath <- system.file('extdata', package='praatpicture')
soundFile <- paste0(datapath, '/1.wav')
praatpicture(soundFile)
```

---

shiny_praatpicture *Run praatpicture as Shiny app*

Description

Interactive version of praatpicture

Usage

```
shiny_praatpicture()
```

Value

No return values

Examples

```
## Not run:
shiny_praatpicture()

## End(Not run)
```

specplot *Plot spectrogram*

Description

Function for plotting spectrograms called by praatpicture. Instead of using this function directly, just use `praatpicture('my_sound_file', frames='spectrogram')`.

Usage

```
specplot(
  sig,
  sr,
  t,
  start,
  end,
  tfrom0 = TRUE,
  scale = "hz",
  freqRange = NULL,
  windowLength = 0.005,
  dynamicRange = 60,
  timeStep = 1000,
  windowShape = "Gaussian",
  colors = c("white", "black"),
  pitch_plotOnSpec = FALSE,
  pt = NULL,
  pitch_plotType = "draw",
  pitch_scale = "hz",
  pitch_freqRange = NULL,
  pitch_axisLabel = NULL,
  pitch_color = "black",
  pitch_highlight = NULL,
  formant_plotOnSpec = FALSE,
  fm = NULL,
  formant_plotType = "speckle",
  formant_dynamicRange = 30,
  formant_color = "black",
  formant_highlight = NULL,
  intensity_plotOnSpec = FALSE,
  it = NULL,
  intensity_range = NULL,
  intensity_axisLabel = "Intensity (dB)",
  intensity_color = "black",
  intensity_highlight = NULL,
  tgbool = FALSE,
  lines = NULL,
  focusTierColor = "black",
```

```
  focusTierLineType = "dotted",
  ind = NULL,
  min_max_only = TRUE,
  highlight = NULL,
  axisLabel = NULL,
  drawSize = 1,
  speckleSize = 1,
  suppressAxes = FALSE
)
```

Arguments

sig	Numeric vector corresponding to a sound signal.
sr	Integer giving the sampling rate of the signal.
t	Numeric vector giving times corresponding to the signal.
start	Start time (in seconds) of desired plotted area.
end	End time (in seconds) of desired plotted area.
tfrom0	Logical; should time on the x-axis run from 0 or from the original time? Default is TRUE.
scale	String giving the frequency scale to use for plotting spectrograms. Default is hz. Alternatives are erb (for the equivalent rectangular bandwidth scale), mel (for the Mel scale, using 1000 Hz as the corner frequency, following Fant 1968), or logarithmic (for log Hz).
freqRange	Vector of two integers giving the frequency range to be used for plotting spectrograms. Default is NULL, in which case suitable ranges are chosen based on the frequency scale. For hz, the default is c(0,5000); for erb, the default is c(0.8,42); for mel, the default is c(30,4400). The latter two correspond roughly to the human auditory frequency response.
windowLength	Window length in seconds for generating spectrograms. Default is 0.005.
dynamicRange	Dynamic range in dB for generating spectrograms. The maximum intensity minus dynamicRange will all be printed in white. Default is 50.
timeStep	How many time steps should be calculated for spectrograms? Default is 1000. Note that this takes a while to plot, so for fiddling with plotting parameters it is a good idea to choose a smaller value.
windowShape	String giving the name of the window shape to be applied to the signal when generating spectrograms. Default is Gaussian; other options are square, Hamming, Bartlett, Hanning, or Blackman. Note that the Gaussian window function provided by the phonTools package and used in praatpicture() does not have the same properties as the Gaussian window function used for spectral estimation in Praat; plotting a simple sine wave with high dynamic range will produce sidelobes in praatpicture() but not in Praat. It's recommended to use Blackman windows instead if you have this problem.
colors	Vector of strings giving the names of colors to be used for plotting the spectrogram; default is c('white', 'black'). The first value is used for plotting

the lowest visible amplitude, and the last for plotting the highest visible amplitude. Vectors with more than two color names can be used for plotting values in between in different colors.

`pitch_plotOnSpec`
: Boolean; should pitch be plotted on top of spectrogram? Default is `FALSE`.

`pt`
: Pitch object loaded using rPraat::pt.read or similar object.

`pitch_plotType`
: String giving the type of pitch plot to produce; default is `draw` (a line plot), the only other option is `speckle` (a point plot). Alternatively a vector `c('draw','speckle')` can be passed, in which case both are used.

`pitch_scale`
: String giving the frequency scale to use when producing pitch plots. Default is `hz`; other options are `logarithmic` (also in Hz), `semitones`, `erb`, and `mel`.

`pitch_freqRange`
: Vector of two integers giving the frequency range to be used for producing pitch plots. Default is `NULL`, in which case the pitch range is automatically reset to `c(-12,30)` for the `semitones` scale, `c(0,10)` for the `erb` scale, and `c(50,500)` for the Hz-based scales, following Praat defaults.

`pitch_axisLabel`
: String giving the name of the label to print along the y-axis when printing a pitch track. Default is `NULL`, in which case the axis label will depend on the scale.

`pitch_color`
: String or vector of strings giving the name of the color to be used for plotting pitch. Default is `'black'`. If a vector of two strings is passed, the second color will be used for background highlighting.

`pitch_highlight`
: Named list giving parameters for differential highlighting of pitch based on the time domain. This list should contain information about which parts of the plot to highlight, either done with the `start` and `end` arguments which must be numbers or numeric vectors, or using the `tier` and `label` arguments to highlight based on information in a plotted TextGrid. Further contains the optional arguments `color` (string or vector of strings, see `pitch_color`), `drawSize` or `speckleSize` (both numeric).

`formant_plotOnSpec`
: Boolean; should formants be plotted on top of spectrogram? Default is `FALSE`.

`fm`
: Formant object loaded using rPraat::formant.read or similar object.

`formant_plotType`
: String giving the type of formant plot to produce; default is `speckle` (a point plot), the only other option is `draw` (a line plot). Alternatively a vector `c('draw','speckle')` can be passed, in which case both are used.

`formant_dynamicRange`
: Dynamic range in dB for producing formant plots. When a formant plot of `formant_plotType='speckle'` is drawn, no formants are shown in frames with intensity level `formant_dynamicRange` below the maximum intensity. Default is `30`. If set to `0`, all formants are shown.

`formant_color`
: String or vector of strings giving the name(s) of colors to be used for plotting formants. If one color is provided, all formants will be plotted in this color. If multiple colors are provided, different formants will be shown in different

colors. Default is 'black'. If the length of this vector twice the number of formants plotted, the first half of strings will be used for the formants' primary colors and the second half will be used for background highlighting. If the length of this vector is one more than the number of formants plotted, the last string will be used for background highlighting.

formant_highlight

Named list giving parameters for differential highlighting of formants based on the time domain. This list should contain information about which parts of the plot to highlight, either done with the start and end arguments which must be numbers or numeric vectors, or using the tier and label arguments to highlight based on information in a plotted TextGrid. Further contains the optional arguments color (string or vector of strings, see formant_color), drawSize or speckleSize (both numeric).

intensity_plotOnSpec

Boolean; should intensity be plotted on top of spectrogram? Default is FALSE.

it Intensity object loaded using rPraat::it.read or similar object.

intensity_range

Vector of two integers giving the intensity range to be used for producing intensity plots. Default is NULL, in which case the range is simply the minimum and maximum levels in the curve.

intensity_axisLabel

String giving the name of the label to print along the y-axis when plotting intensity. Default is Intensity (dB).

intensity_color

String or vector of strings giving the name of the color to be used for plotting intensity. Default is 'black'. If a vector of two strings is passed, the second color will be used for background highlighting.

intensity_highlight

Named list giving parameters for differential highlighting of the intensity contour based on the time domain. This list should contain information about which parts of the plot to highlight, either done with the start and end arguments which must be numbers or numeric vectors, or using the tier and label arguments to highlight based on information in a plotted TextGrid. Further contains the optional arguments color (string or vector of strings, see intensity_color) and drawSize (integer).

tgbool Logical; should dotted lines be plotted corresponding to locations in a TextGrid? Default is FALSE.

lines Numeric vector giving locations in seconds of locations from a TextGrid to be plotted with dotted lines. Default is NULL.

focusTierColor String or vector of strings giving the color(s) to use for plotting focus tier lines. If multiple tiers are focused, a vector of the same length can be passed, and the nth tier will be plotted in the nth color. Default is 'black'.

focusTierLineType

String or vector of strings giving the line type(s) for plotting focus tier lines. If multiple tiers are focused, a vector of the same length can be passed, and the nth tier will be plotted in the nth line type. Default is 'dotted'.

ind	Integer indexing waveform relative to other plot components. Default is NULL.
min_max_only	Logical; should only minimum and maximum values be given on the y-axis? Default is TRUE. Can also be a logical vector if some but not all plot components should have minimum and maximum values on the y-axis. Ignored for TextGrid component.
highlight	Named list giving parameters for differential highlighting of the spectrogram based on the time domain. This list should contain information about which parts of the plot to highlight, either done with the start and end arguments which must be numbers or numeric vectors, or using the tier and label arguments to highlight based on information in a plotted TextGrid. Further contains the argument colors (vector of strings, see colors). Can be nested lists to highlight different parts of a figure in different ways.
axisLabel	String giving the name of the label to print along the y-axis when plotting a spectrogram. Default is NULL, in which case the axis label will depend on the scale.
drawSize	Number indicating the line width of plot components where the _plotType is 'draw' (i.e., pitch, formants, or intensity rendered as line plots). Default is 1. Controls the lwd argument of graphics::lines.
speckleSize	Number indicating the point size of plot components where the _plotType is 'speckle' (i.e. pitch or formants rendered as point plots). Default is 1. Controls the cex arguments of graphics::points.
suppressAxes	Should all axes and the box around plots be suppressed? Default is FALSE. Generally not recommended.

Value

No return values, called internally by praatpicture and sibling functions.

Examples

```
# Don't use directly
datapath <- system.file('extdata', package='praatpicture')
soundFile <- paste0(datapath, '/1.wav')
praatpicture(soundFile, frames='spectrogram')
```

---

talking_praatpicture *Make Praat Picture style plots of acoustic data with embedded audio*

Description

Generate simple MP4 video files with Praat Picture style plots of acoustic data with time-aligned transcriptions and embedded audio to use in presentations etc.

Usage

```
talking_praatpicture(
  sound,
  start = 0,
  end = 0,
  frames = c("sound", "spectrogram", "TextGrid"),
  draw_lines = list("formant", h = seq(0, 10000, by = 1000), lty = "dotted"),
  audio_start = start,
  audio_end = end,
  width = 1080,
  height = 720,
  pointsize = 25,
  cursor = FALSE,
  cursor_frameRate = 50,
  cursor_color = "black",
  cursor_lwd = 2,
  verbose = TRUE,
  outputFile = "praatvid.mp4",
  useViewer = TRUE,
  ...
)
```

Arguments

sound	String giving the file name of a sound file with the .wav extension.
start	Start time (in seconds) of desired plotted area. Default is 0.
end	End time (in seconds) of desired plotted area. Default is 0 (= the entire file).
frames	String or vector of strings giving the frames that the plot should consist of. Default is sound, spectrogram, TextGrid. This requires a file with the extension .TextGrid and the same base name as the sound file. Other options are pitch, formant, and intensity. See details for more information.
draw_lines	Use for drawing straight lines on plot components. Takes an argument of type list which should contain a) a string giving the plot component to draw straight lines on, and b) arguments to pass on to graphics::abline. Should have a named argument h for horizontal lines, or v for vertical lines, or a,b for the intercept and slope of the line otherwise. Alternatively a nested list can be passed if more (sets of) lines should be drawn. If multiple audio channels are plotted and lines should be added to one of these, use the channel identifier instead of a string giving the frame to draw on. The default value is list('formant', h=seq(0,10000,by=1000), lty='dotted'). According to Praat defaults, this means that if formants are plotted in a separate frame, horizontal dotted lines (lty) are shown at 1000 Hz intervals. To override this behavior, simply pass draw_lines=NULL. The argument is ignored if cursor = TRUE.
audio_start	Start time (in seconds) of embedded audio. By default it is the same as start, i.e. the embedded audio is the portion of the sound file that is being plotted.
audio_end	End time (in seconds) of embedded audio. By default it is the same as end, i.e. the embedded audio is the portion of the sound that is being plotted.

width	Number giving the desired width of the resulting animation in pixels; default is 1080.
height	Number giving the desired height of the resulting animation in pixels; default is 720.
pointsize	Number; which point size should be used for text in the animation? Default is 25. See grDevices::png() for more details.
cursor	Logical; should a moving cursor show the current position in the sound file? Default is FALSE.
cursor_frameRate	Number giving the desired number of frames per second for moving cursor. Default is 50.
cursor_color	String giving the color of the moving cursor. Default is black.
cursor_lwd	Number giving the line width of the moving cursor. Default is 2.
verbose	Logical; should status messages be printed in the console as figures are being generated? Default is TRUE.
outputFile	String giving the desired file name. Default is praatvid.mp4.
useViewer	Logical; should the video be shown in the Viewer pane in RStudio? Default is TRUE; if true, the video is oSnly saved in a temporary directory, but can be downloaded from a browser.
...	Further arguments passed to praatpicture.

Value

No return value, produces a video file.

See Also

This function is a wrapper for av::av_capture_graphics() used to produce plots similar to those made with praatpicture() with embedded audio. For more detail on your options, see the praatpicture() help file.

Examples

```
## Not run:
datapath <- system.file('extdata', package='praatpicture')
soundFile <- paste0(datapath, '/1.wav')
talking_praatpicture(soundFile)

## End(Not run)
```

tgplot *Plot TextGrid*

Description

Function for plotting TextGrids called by praatpicture. Instead of using this function directly, just use `praatpicture('my_sound_file', frames='TextGrid')`.

Usage

```
tgplot(
  tg,
  t,
  sr,
  start,
  end,
  tiers = 1,
  tfrom0 = TRUE,
  tierNames = TRUE,
  alignment = "central",
  edgeLabels = "keep",
  specialChar = FALSE,
  color = "black",
  highlight = NULL
)
```

Arguments

`tg`	TextGrid object loaded using rPraat::tg.read
`t`	Numeric vector giving times corresponding to the signal.
`sr`	Integer giving the sampling rate of the signal.
`start`	Start time (in seconds) of desired plotted area.
`end`	End time (in seconds) of desired plotted area.
`tiers`	Vector of number or strings giving either numeric identifiers of TextGrid tiers to plot or the names of TextGrid tiers to plot. Default is 1, which plots just the first tier.
`tfrom0`	Logical; should time on the x-axis run from 0 or from the original time? Default is TRUE.
`tierNames`	Logical; should TextGrid tier names be printed along the y-axis? Default is TRUE.
`alignment`	String giving the desired alignment of text in the TextGrids. Default is `central`; other options are `left` and `right`. Alternatively, a vector of strings if different alignments are needed.

edgeLabels	String specifying how to handle TextGrid labels in interval tiers that fall partially before start or partially after end. Default is 'keep', where labels are kept at the center of the interval. Other options are 'center', where labels are recentered to the visible part of the interval, or 'discard', where such labels are ignored.
specialChar	Logical; should Praat typesetting for special font types such as italic, bold, and small caps be converted into corresponding R-readable special font types. Default is FALSE, since special characters can create unfortunate text alignment artefacts. See https://www.fon.hum.uva.nl/praat/manual/Text_styles.html.
color	String or vector of strings giving the name of the color(s) to be used for the text in TextGrids. Default is 'black'. If a vector is provided, different colors are used for different tiers.
highlight	Named list giving parameters for differential highlighting of TextGrid intervals. This list should contain information about which intervals to highlight, using the tier and label. Further contains the argument color, and background (a string specifying a background color). Can be nested lists to highlight different parts of a figure in different ways.

Value

No return values, called internally by praatpicture and sibling functions.

Examples

```
# Don't use directly
datapath <- system.file('extdata', package='praatpicture')
soundFile <- paste0(datapath, '/1.wav')
praatpicture(soundFile, frames='TextGrid')
```

---

tg_createTier *Interactively create a TextGrid tier*

Description

Function for creating TextGrid tiers called by make_TextGrid. Instead of using this function directly, use make_TextGrid.

Usage

```
tg_createTier(
  sound,
  tierName,
  start = 0,
  end = 0,
  show = "wave",
  channel = 1,
  sampa2ipa = FALSE
)
```

Arguments

sound	String giving the file name of a sound file with the .wav extension.
tierName	String giving the name of the tier.
start	Start time (in seconds) of desired plotted area. Default is 0.
end	End time (in seconds) of desired plotted area. Default is 0 (= the entire file).
show	String giving the type of plot to show. Default is wave, another option is spectrogram. Note that spectrogram plotting is relatively slow within this function.
channel	Number indicating which audio channel to show. Default is 1.
sampa2ipa	Logical; should SAMPA transcriptions be converted to IPA? Default is FALSE.

Value

A list object identical to a single tier created by rPraat::tg.read() when loading TextGrid objects into R.

Examples

```
## Not run:
# Don't use directly
datapath <- system.file('extdata', package='praatpicture')
soundFile <- paste0(datapath, '/2.wav')
tg <- make_TextGrid(soundFile, tierNames='Mary')
# Follow the steps shown in the console

praatpicture(soundFile, tg_obj=tg)

## End(Not run)
```

---

tg_stylize *Convert Praat font styles to R font styles*

Description

Helper function for converting Praat font styles such as italics, bold, and small caps into expressions that can be read by base R plots. Instead of using this function directly, just use praatpicture('my_sound_file', frames='TextGrid', tg_specialChar=TRUE).

Usage

```
tg_stylize(lab)
```

Arguments

lab	A string or vector of strings with labels from a TextGrid.

Value

A list with elements of class `expression`.

Examples

```
# Don't use directly
datapath <- system.file('extdata', package='praatpicture')
soundFile <- paste0(datapath, '/1.wav')

# With stylized text
praatpicture(soundFile, frames='TextGrid')

# Without stylized text
praatpicture(soundFile, frames='TextGrid', tg_specialChar=FALSE)
```

---

waveplot *Plot waveform*

Description

Function for plotting waveforms called by praatpicture. Instead of using this function directly, just use `praatpicture('my_sound_file', frames='sound')`.

Usage

```
waveplot(
  sig,
  bit,
  t,
  start,
  tfrom0 = TRUE,
  nchan = 1,
  energyRange = NULL,
  color = "black",
  pitch_plotOnWave = FALSE,
  pt = NULL,
  pitch_plotType = "draw",
  pitch_scale = "hz",
  pitch_freqRange = NULL,
  pitch_axisLabel = NULL,
  pitch_color = "black",
  pitch_highlight = NULL,
  intensity_plotOnWave = FALSE,
  it = NULL,
  intensity_range = NULL,
  intensity_axisLabel = "Intensity (dB)",
  intensity_color = "black",
```

```
  intensity_highlight = NULL,
  tgbool = FALSE,
  lines = NULL,
  focusTierColor = "black",
  focusTierLineType = "dotted",
  ind = NULL,
  line_comp = NULL,
  rect_comp = NULL,
  arr_comp = NULL,
  annot_comp = NULL,
  draw_lines = NULL,
  draw_rectangle = NULL,
  draw_arrow = NULL,
  annotate = NULL,
  channelNames = FALSE,
  axisDigits = 3,
  lineWidth = 1,
  cn = NULL,
  min_max_only = TRUE,
  highlight = NULL,
  drawSize = 1,
  speckleSize = 1,
  suppressAxes = FALSE
)
```

Arguments

sig	Numeric vector corresponding to a sound signal.
bit	Numeric; will generally be grabbed from a loaded WaveMC object.
t	Numeric vector giving times corresponding to the signal.
start	Start time (in seconds) of desired plotted area.
tfrom0	Logical; should time on the x-axis run from 0 or from the original time? Default is TRUE.
nchan	Numeric; how many channels will be plotted? Default is 1.
energyRange	Numeric vector giving the desired energy range (y-axis range) of waveform(s). Default is NULL, in which case the y-axis range is set to the lowest and highest value for each wave. If a vector of two values is passed for a multi-wave plot, these are recycled for each wave. Separate ranges can be set for each waveform by passing a vector of a length corresponding to twice the number of waves plotted.
color	String giving the name of the color to be used for plotting the waveform. Default is 'black'. Alternatively, a vector of colors, if different channels should be plotted with different colors.
pitch_plotOnWave	Boolean; should pitch be plotted on top of waveform? Default is FALSE.
pt	Pitch object loaded using rPraat::pt.read or similar object.

pitch_plotType String giving the type of pitch plot to produce; default is `draw` (a line plot), the only other option is `speckle` (a point plot). Alternatively a vector `c('draw','speckle')` can be passed, in which case both are used.

pitch_scale String giving the frequency scale to use when producing pitch plots. Default is `hz`; other options are `logarithmic` (also in Hz), `semitones`, `erb`, and `mel`.

pitch_freqRange
Vector of two integers giving the frequency range to be used for producing pitch plots. Default is `NULL`, in which case the pitch range is automatically reset to `c(-12,30)` for the `semitones` scale, `c(0,10)` for the `erb` scale, and `c(50,500)` for the Hz-based scales, following Praat defaults.

pitch_axisLabel
String giving the name of the label to print along the y-axis when printing a pitch track. Default is `NULL`, in which case the axis label will depend on the scale.

pitch_color String or vector of strings giving the name of the color to be used for plotting pitch. Default is `'black'`. If a vector of two strings is passed, the second color will be used for background highlighting.

pitch_highlight
Named list giving parameters for differential highlighting of pitch based on the time domain. This list should contain information about which parts of the plot to highlight, either done with the `start` and `end` arguments which must be numbers or numeric vectors, or using the `tier` and `label` arguments to highlight based on information in a plotted TextGrid. Further contains the optional arguments `color` (string or vector of strings, see `pitch_color`), `drawSize` or `speckleSize` (both numeric).

intensity_plotOnWave
Boolean; should intensity be plotted on top of waveform? Default is `FALSE`.

it Intensity object loaded using rPraat::it.read or similar object.

intensity_range
Vector of two integers giving the intensity range to be used for producing intensity plots. Default is `NULL`, in which case the range is simply the minimum and maximum levels in the curve.

intensity_axisLabel
String giving the name of the label to print along the y-axis when plotting intensity. Default is `Intensity (dB)`.

intensity_color
String or vector of strings giving the name of the color to be used for plotting intensity. Default is `'black'`. If a vector of two strings is passed, the second color will be used for background highlighting.

intensity_highlight
Named list giving parameters for differential highlighting of the intensity contour based on the time domain. This list should contain information about which parts of the plot to highlight, either done with the `start` and `end` arguments which must be numbers or numeric vectors, or using the `tier` and `label` arguments to highlight based on information in a plotted TextGrid. Further contains the optional arguments `color` (string or vector of strings, see `intensity_color`) and `drawSize` (integer).

tgbool — Logical; should dotted lines be plotted corresponding to locations in a TextGrid? Default is FALSE.

lines — Numeric vector giving locations in seconds of locations from a TextGrid to be plotted with dotted lines. Default is NULL.

focusTierColor — String or vector of strings giving the color(s) to use for plotting focus tier lines. If multiple tiers are focused, a vector of the same length can be passed, and the nth tier will be plotted in the nth color. Default is 'black'.

focusTierLineType — String or vector of strings giving the line type(s) for plotting focus tier lines. If multiple tiers are focused, a vector of the same length can be passed, and the nth tier will be plotted in the nth line type. Default is 'dotted'.

ind — Integer indexing waveform relative to other plot components. Default is NULL.

line_comp — Vector of strings or numbers giving plot components to draw straight lines on. Default is NULL.

rect_comp — Vector of strings or numbers giving plot components to draw rectangles on. Default is NULL.

arr_comp — Vector of strings of numbers giving plot components to draw arrows on. Default is NULL.

annot_comp — Vector of strings of numbers giving plot components to annotate. Default is NULL.

draw_lines — List of arguments for drawing straight lines passed from praatpicture(). Default is NULL.

draw_rectangle — List of arguments for drawing rectangles passed from praatpicture(). Default is NULL.

draw_arrow — List of arguments for drawing arrows passed from praatpicture(). Default is NULL.

annotate — List of arguments for annotating passed from praatpicture(). Default is NULL.

channelNames — Logical; should names of audio channels be printed on the y-axis? Default is FALSE.

axisDigits — Numeric giving the number of digits to print for values along the y-axis of the waveform. Default is 3. If 0 is passed, the y-axis is suppressed. Alternatively a vector of numbers, if different numbers should be used for different channels. Note that this only applies when min_max_only = TRUE, as otherwise the look of the y-axis is determined entirely using grDevices::axisTicks().

lineWidth — Number giving the line width to use for plotting the waveform. Default is 1. Alternatively a vector of numbers, if different line widths should be used for different channels.

cn — Vector of strings with channel names to be printed on the y-axis if channelNames is TRUE.

min_max_only — Logical; should only minimum and maximum values be given on the y-axis? Default is TRUE. Can also be a logical vector if some but not all plot components should have minimum and maximum values on the y-axis. Ignored for TextGrid component.

`highlight` Named list giving parameters for differential highlighting of the waveform based on the time domain. This list should contain information about which parts of the plot to highlight, either done with the `start` and `end` arguments which must be numbers or numeric vectors, or using the `tier` and `label` arguments to highlight based on information in a plotted TextGrid. Further contains the argument `color` (string, see `color`), and `background` (a string specifying a background color). Can be nested lists to highlight different parts of a figure in different ways.

`drawSize` Number indicating the line width of plot components where the `_plotType` is `'draw'` (i.e., pitch, formants, or intensity rendered as line plots). Default is `1`. Controls the `lwd` argument of graphics::lines.

`speckleSize` Number indicating the point size of plot components where the `_plotType` is `'speckle'` (i.e. pitch or formants rendered as point plots). Default is `1`. Controls the `cex` arguments of graphics::points.

`suppressAxes` Should all axes and the box around plots be suppressed? Default is `FALSE`. Generally not recommended.

Value

No return values, called internally by praatpicture and sibling functions.

Examples

```
# Don't use directly
datapath <- system.file('extdata', package='praatpicture')
soundFile <- paste0(datapath, '/1.wav')
praatpicture(soundFile, frames='sound')
```

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