

Package ‘shiny.gosling’

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Data Visualization for R and Shiny

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Description A Grammar-based Toolkit for Scalable and Interactive Genomics Data Visualization. <http://gosling-lang.org/>. This R package is based on gosling.js. It uses R functions to create gosling plots that could be embedded onto R Shiny apps.

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`add_file_to_resource_path`*Track data object builder for local csv files*

Description

Get an object for using local csv to build plots

Usage

```
add_file_to_resource_path(file_path = NULL, object = NULL)
```

Arguments

| | |
|------------------------|--|
| <code>file_path</code> | A character. Specify the <code>file_path</code> to the local csv file. |
| <code>object</code> | A gr ranges object. |

Value

list of data specs for a local csv file

`add_mark`*Visual marks*

Description

Visual marks (e.g., points, lines, and bars) are the basic graphical elements of a visualization.

Usage

```
add_mark(  
  x = NULL,  
  xe = NULL,  
  x1 = NULL,  
  x1e = NULL,  
  y = NULL,  
  strokeWidth = NULL,  
  opacity = NULL,  
  row = NULL,  
  size = NULL,  
  color = NULL,  
  stroke = NULL  
)
```

Arguments

| | |
|-------------|--|
| x | An object returned by <code>visual_channel_x()</code> . |
| xe | An object returned by <code>visual_channel_x()</code> . |
| x1 | An object returned by <code>visual_channel_x()</code> . |
| x1e | An object returned by <code>visual_channel_x()</code> . |
| y | An object returned by <code>visual_channel_y()</code> . |
| strokeWidth | A number or an object returned by <code>visual_channel_stroke_width()</code> . |
| opacity | A number or an object returned by <code>visual_channel_opacity()</code> . |
| row | A factor data column Channel row is used with channel y to stratify a visualization with categorical values. |
| size | A number or an object returned by <code>visual_channel_size()</code> . |
| color | A character or an object returned by <code>visual_channel_color()</code> . |
| stroke | A number or an object returned by <code>visual_channel_stroke()</code> . |

Details

For info visit <http://gosling-lang.org/docs/mark>

Value

list of mark specifications

| | |
|------------------|-------------------------------|
| add_multi_tracks | <i>Combine single tracks.</i> |
|------------------|-------------------------------|

Description

Combine single tracks.

Usage

```
add_multi_tracks(...)
```

Arguments

... Multiple tracks from `add_single_track()` function.

Value

json list.

Examples

```

if(interactive()) {
  library(shiny)
  library(shiny.gosling)

  track5_styles <- default_track_styles(
    legendTitle = "SV Class"
  )
  track5_data <- track_data(
    url = "https://s3.amazonaws.com/gosling-lang.org/data/cancer/rearrangement.PD35930a.csv",
    type = "csv",
    genomicFieldsToConvert = json_list(
      json_list(
        chromosomeField = "chr1",
        genomicFields = c("start1", "end1")
      ),
      json_list(
        chromosomeField = "chr2",
        genomicFields = c("start2", "end2")
      )
    )
  )
  track5_tracks <- add_multi_tracks(
    add_single_track(
      mark = "rect"
    ),
    add_single_track(
      mark = "withinLink", x = visual_channel_x(linkingId = "mid-scale"),
      strokeWidth = 0
    )
  )
  track5_color <- visual_channel_color(
    field = "svclass",
    type = "nominal",
    legend = TRUE,
    domain = json_list(
      "tandem-duplication", "translocation", "deletion", "inversion"
    ),
    range = json_list(
      "#569C4D", "#4C75A2", "#DA5456", "#EA8A2A"
    )
  )
  track5_stroke <- visual_channel_stroke(
    field = "svclass",
    type = "nominal",
    domain = json_list(
      "tandem-duplication", "translocation", "deletion", "inversion"
    ),
    range = json_list(
      "#569C4D", "#4C75A2", "#DA5456", "#EA8A2A"
    )
  )
  track5_x <- visual_channel_x(field = "start1", type = "genomic")
  track5_xe <- visual_channel_x(field = "end2", type = "genomic")
  track5 <- add_single_track(
    id = "track5", title = "Structural Variant",

```

```

    data = track5_data, mark = "withinLink",
    x = track5_x, xe = track5_xe,
    color = track5_color, width = 500, height = 80, stroke = track5_stroke,
    strokeWidth = 1, opacity = 0.6, style = track5_styles
  )

  composed_track <- compose_view(
    multi = TRUE,
    tracks = add_multi_tracks(
      track5
    ),
    xOffset = 190, layout = "circular", spacing = 1
  )

  composed_views <- arrange_views(
    views = composed_track,
    arrangement = "vertical"
  )

  ui <- fluidPage(
    use_gosling(),
    fluidRow(
      column(6, goslingOutput("gosling_plot"))
    )
  )

  server <- function(input, output, session) {
    output$gosling_plot <- renderGosling({
      gosling(
        component_id = "component_2",
        composed_views, clean_braces = FALSE
      )
    })
  }

  shinyApp(ui, server)
}

```

add_single_track

Add a single track

Description

Add a single track to the plot of a mark type (plot type). This function constructs a single track from the inputs. The inputs can be id, data, mark etc. Please check gosling.js documentation for usage.

Usage

```

add_single_track(
  id = NULL,
  data = NULL,

```

```

    mark = NULL,
    assembly = NULL,
    row = NULL,
    size = NULL,
    color = NULL,
    strokeWidth = NULL,
    opacity = NULL,
    x = NULL,
    xe = NULL,
    x1 = NULL,
    x1e = NULL,
    y = NULL,
    stroke = NULL,
    width = NULL,
    height = NULL,
    dataTransform = NULL,
    ...
)

```

Arguments

| | |
|-------------|---|
| id | Optional argument to assign an id to the track. |
| data | An object of from track_data() function. |
| mark | Type of plot. One of c("point", "line", "rect", "bar", "area", "link", "triangle", "text"). Each mark type has some supported visual channel. Different marks support different visual channels: <ul style="list-style-type: none"> • point: x, y, row, size, color, strokeWidth, opacity • line: x, y, row, color, strokeWidth • rect: x, xe, row, color, strokeWidth, opacity • bar: x, y, row, color, strokeWidth, opacity • area: x, y, row, color, strokeWidth • link: x, xe, x1, x1e, color, opacity • triangle: x, xe, row, size, color, opacity • text: x, xe, row, color, opacity For more info visit http://gosling-lang.org/tutorials/ |
| assembly | Currently support "hg38", "hg19", "hg18", "hg17", "hg16", "mm10", "mm9". Defaults to "hg38". |
| row | An object of from visual_channel_row(). |
| size | An object of from visual_channel_size() OR an atomic number. |
| color | An object of from visual_channel_color() OR and atomic character hex code of the form "#123456". |
| strokeWidth | An object of from visual_channel_stroke_width() OR an atomic number. |
| opacity | An object of from visual_channel_opacity() OR and atomic ratio from 0 to 1. |
| x | An object of from visual_channel_x() OR an atomic value. |
| xe | An object of from visual_channel_x() OR an atomic value. |
| x1 | An object of from visual_channel_x() OR an atomic value. |
| x1e | An object of from visual_channel_x() OR an atomic value. |

| | |
|---------------|--|
| y | An object of from <code>visual_channel_y()</code> OR an atomic value. |
| stroke | An object of from <code>visual_channel_stroke()</code> function OR a character of hex color code like "#123456". |
| width | A number interpreted in units of pixel. |
| height | A number interpreted in units of pixel. |
| dataTransform | An object of from <code>track_data_transform()</code> function. |
| ... | Any other arguments to be passed onto <code>gosling.js</code> . |

Value

list object.

Examples

```
if(interactive()) {
  library(shiny)
  library(shiny.gosling)

  cistrome_data <-
    "https://server.gosling-lang.org/api/v1/tileset_info/?d=cistrome-multivec"

  single_track <- add_single_track(
    id = "track1",
    data = track_data(
      url = cistrome_data,
      type = "multivec",
      row = "sample",
      column = "position",
      value = "peak",
      categories = c("sample 1", "sample 2", "sample 3", "sample 4"),
      binSize = 4,
    ),
    mark = "rect",
    x = visual_channel_x(field = "start", type = "genomic", axis = "top"),
    xe = visual_channel_x(field = "end", type = "genomic"),
    row = visual_channel_row(
      field = "sample",
      type = "nominal",
      legend = TRUE
    ),
    color = visual_channel_color(
      field = "peak",
      type = "quantitative",
      legend = TRUE
    ),
    tooltip = visual_channel_tooltips(
      visual_channel_tooltip(field = "start", type = "genomic",
        alt = "Start Position"),
      visual_channel_tooltip(field = "end", type = "genomic",
        alt = "End Position"),
      visual_channel_tooltip(
        field = "peak",
        type = "quantitative",
        alt = "Value",
        format = "0.2"
      )
    )
  )
}
```



```

    )
  ),
  width = 600,
  height = 130
)

single_composed_track <- compose_view(
  tracks = single_track
)

single_composed_views <- arrange_views(
  title = "Single Track",
  subtitle = "This is the simplest single track visualization with a linear layout",
  layout = "circular", #"linear"
  views = single_composed_track,
  xDomain = list(
    chromosome = "chr1",
    interval = c(1, 3000500)
  )
)

ui <- fluidPage(
  use_gosling(),
  fluidRow(
    column(6, goslingOutput("gosling_plot")),
    column(
      1, br(), actionButton(
        "download_png",
        "PNG",
        icon = icon("cloud-arrow-down")
      )
    )
  )
)

server <- function(input, output, session) {
  output$gosling_plot <- renderGosling({
    gosling(
      component_id = "component_1",
      single_composed_views,
      clean_braces = TRUE
    )
  })

  observeEvent(input$download_png, {
    export_png(component_id = "component_1")
  })
}

shinyApp(ui, server)
}

```

Description

Arrange views from `compose_view()` function.

Usage

```
arrange_views(layout = NULL, views = NULL, listify = TRUE, ...)
```

Arguments

| | |
|----------------------|--|
| <code>layout</code> | One of "linear" or "circular". |
| <code>views</code> | An object from <code>compose_view()</code> function. |
| <code>listify</code> | A Boolean. Convert views to list.. |
| <code>...</code> | More options passed to <code>gosling.js</code> . |

Value

list object.

Examples

```
if(interactive()) {
  library(shiny)
  library(shiny.gosling)

  # View 2 Track 3----
  view2_track3_data <- track_data(
    url = "https://server.gosling-lang.org/api/v1/tileset_info/?d=NC_045512_2-multivec",
    type = "multivec",
    row = "base",
    column = "position",
    value = "count",
    categories = c("A", "T", "G", "C"),
    start = "start",
    end = "end"
  )

  view2_track3a <- add_single_track(
    mark = "bar",
    y = visual_channel_y(
      field = "count", type = "quantitative", axis = "none"
    )
  )

  view2_track3b <- add_single_track(
    dataTransform = track_data_transform(
      type = "filter",
      field = "count",
      oneOf = list(),
      not = TRUE
    ),
    mark = "text",
    x = visual_channel_x(
      field = "start", type = "genomic"
    ),
    xe = visual_channel_x(
```

```
      field = "end", type = "genomic"
    ),
    size = 24,
    color = "white",
    visibility = list(list(
      operation = "less-than",
      measure = "width",
      threshold = "|xe-x|",
      transitionPadding = 30,
      target = "mark"
    ),
    list(
      operation = "LT",
      measure = "zoomLevel",
      threshold = 40,
      target = "track"
    ))
  )

view2_track3_x <- visual_channel_x(
  field = "position", type = "genomic"
)

view2_track3_color <- visual_channel_color(
  field = "base",
  type = "nominal",
  domain = c("A", "T", "G", "C"),
  legend = TRUE
)

view2_track3_text <- visual_channel_text(
  field = "base", type = "nominal"
)

view2_track3_style <- default_track_styles(
  inlineLegend = TRUE
)

view2_track3 <- add_single_track(
  title = "NC_045512.2 Sequence",
  alignment = "overlay",
  data = view2_track3_data,
  tracks = add_multi_tracks(
    view2_track3a, view2_track3b
  ),
  x = view2_track3_x,
  color = view2_track3_color,
  text = view2_track3_text,
  style = view2_track3_style,
  width = 800, height = 40
)

view2 <- compose_view(
  multi = TRUE,
  centerRadius = 0,
  xDomain = list(interval = c(1, 29903)),
  linkingId = "detail",
```

```

    alignment = "stack",
    tracks = add_multi_tracks(
      view2_track3
    )
  )

combined_view <- arrange_views(
  title = "SARS-CoV-2",
  subtitle = "Data Source: WashU Virus Genome Browser, NCBI, GISAID",
  assembly = list(list("NC_045512.2", 29903)),
  layout = "linear",
  spacing = 50,
  views = list(view2),
  listify = FALSE
)

ui <- fluidPage(
  use_gosling(),
  fluidRow(
    column(6, goslingOutput("gosling_plot"))
  )
)

server <- function(input, output, session) {
  output$gosling_plot <- renderGosling({
    gosling(
      component_id = "sars_cov2",
      combined_view
    )
  })
}

shinyApp(ui, server)
}

```

atomic_values_to_list *atomic_values_to_list*

Description

atomic_values_to_list

Usage

```
atomic_values_to_list(property_list)
```

Arguments

`property_list` A character or number or another atomic value.

Value

List.

| | |
|--------------|--------------------------------|
| brush_styles | <i>style of the brush mark</i> |
|--------------|--------------------------------|

Description

Customize the style of the brush mark in the rangeSelect mouse event.

Usage

```
brush_styles(
  strokeWidth = NULL,
  strokeOpacity = NULL,
  stroke = NULL,
  opacity = NULL,
  color = NULL
)
```

Arguments

| | |
|---------------|---|
| strokeWidth | A number. stroke width of the marks when mouse events are triggered. |
| strokeOpacity | A number. |
| stroke | A character. Stroke color of the marks when mouse events are triggered. |
| opacity | A number. Opacity of the marks when mouse events are triggered. |
| color | A character. Color of the marks when mouse events are triggered. |

Details

For more info visit <http://gosling-lang.org/docs/visual-channel/#type-brush>

Value

List object with brush styles.

| | |
|------------|---------------------------------------|
| build_json | <i>Build gosling spec from R list</i> |
|------------|---------------------------------------|

Description

Build gosling spec from R list

Usage

```
build_json(r_list, clean_braces = TRUE, pretty = TRUE, auto_unbox = TRUE)
```

Arguments

| | |
|--------------|--|
| r_list | R list object built with other gosling functions |
| clean_braces | Whether to remove extra square brackets from the json string. |
| pretty | Whether to get json with indentation, line breaks etc. |
| auto_unbox | If TRUE will automatically unbox() all atomic vectors of length 1. |

Value

json spec for the gosling output

| | |
|-----------|-------------------------------|
| component | <i>Create react component</i> |
|-----------|-------------------------------|

Description

Create react component

Usage

component(name)

Arguments

| | |
|------|-----------------------------|
| name | name of the react component |
|------|-----------------------------|

Value

function to create react element

| | |
|--------------|----------------------|
| compose_view | <i>Compose views</i> |
|--------------|----------------------|

Description

Compose views from add_single_track() and add_multi_tracks() functions.

Usage

```
compose_view(
  multi = FALSE,
  layout = NULL,
  width = NULL,
  height = NULL,
  centerRadius = NULL,
  tracks,
  ...
)
```

Arguments

| | |
|--------------|--|
| multi | Whether multiple tracks in the view. |
| layout | One of "linear" or "circular". |
| width | A number interpreted in units of pixel. |
| height | A number interpreted in units of pixel. |
| centerRadius | Specify the proportion of the radius of the center white space. A number between c(0,1), default=0.3 |
| tracks | The tracks with add_multi_tracks() function. |
| ... | More arguments passed along with view to gosling.js. |

Value

list object.

Examples

```
if(interactive()) {
  library(shiny)
  library(shiny.gosling)

  # View 2 Track 3----
  view2_track3_data <- track_data(
    url = "https://server.gosling-lang.org/api/v1/tileset_info/?d=NC_045512_2-multivec",
    type = "multivec",
    row = "base",
    column = "position",
    value = "count",
    categories = c("A", "T", "G", "C"),
    start = "start",
    end = "end"
  )

  view2_track3a <- add_single_track(
    mark = "bar",
    y = visual_channel_y(
      field = "count", type = "quantitative", axis = "none"
    )
  )

  view2_track3b <- add_single_track(
    dataTransform = track_data_transform(
      type = "filter",
      field = "count",
      oneOf = list(),
      not = TRUE
    ),
    mark = "text",
    x = visual_channel_x(
      field = "start", type = "genomic"
    ),
    xe = visual_channel_x(
      field = "end", type = "genomic"
    ),
    size = 24,
    color = "white",
    visibility = list(list(
      operation = "less-than",
      measure = "width",
      threshold = "|xe-x|",
      transitionPadding = 30,
      target = "mark"
    )),
    list(
      operation = "LT",
      measure = "zoomLevel",
      threshold = 40,
      target = "track"
    )
  )
}
```

```

    ))
  )

view2_track3_x <- visual_channel_x(
  field = "position", type = "genomic"
)

view2_track3_color <- visual_channel_color(
  field = "base",
  type = "nominal",
  domain = c("A", "T", "G", "C"),
  legend = TRUE
)

view2_track3_text <- visual_channel_text(
  field = "base", type = "nominal"
)

view2_track3_style <- default_track_styles(
  inlineLegend = TRUE
)

view2_track3 <- add_single_track(
  title = "NC_045512.2 Sequence",
  alignment = "overlay",
  data = view2_track3_data,
  tracks = add_multi_tracks(
    view2_track3a, view2_track3b
  ),
  x = view2_track3_x,
  color = view2_track3_color,
  text = view2_track3_text,
  style = view2_track3_style,
  width = 800, height = 40
)

view2 <- compose_view(
  multi = TRUE,
  centerRadius = 0,
  xDomain = list(interval = c(1, 29903)),
  linkingId = "detail",
  alignment = "stack",
  tracks = add_multi_tracks(
    view2_track3
  )
)

combined_view <- arrange_views(
  title = "SARS-CoV-2",
  subtitle = "Data Source: WashU Virus Genome Browser, NCBI, GISAID",
  assembly = list(list("NC_045512.2", 29903)),
  layout = "linear",
  spacing = 50,
  views = list(view2),
  listify = FALSE
)

```



```
ui <- fluidPage(  
  use_gosling(),  
  fluidRow(  
    column(6, goslingOutput("gosling_plot"))  
  )  
)  
  
server <- function(input, output, session) {  
  output$gosling_plot <- renderGosling({  
    gosling(  
      component_id = "sars_cov2",  
      combined_view  
    )  
  })  
}  
  
shinyApp(ui, server)  
}
```

default_track_styles *Default styles for tracks*

Description

Default styles for tracks

Usage

```
default_track_styles(  
  textStrokeWidth = NULL,  
  textStroke = NULL,  
  textFontWeight = NULL,  
  textFontSize = NULL,  
  textAnchor = NULL,  
  select = NULL,  
  outlineWidth = NULL,  
  outline = NULL,  
  mouseOver = NULL,  
  matrixExtent = NULL,  
  linkStyle = NULL,  
  linkMinHeight = NULL,  
  linkConnectionType = NULL,  
  linePattern = NULL,  
  legendTitle = NULL,  
  inlineLegend = NULL,  
  enableSmoothPath = NULL,  
  dy = NULL,  
  dx = NULL,  
  dashed = NULL,  
  curve = NULL,
```

```

brush = NULL,
backgroundOpacity = NULL,
background = NULL,
align = NULL,
...
)

```

Arguments

| | |
|--------------------|---|
| textStrokeWidth | A number. Specify the stroke width of text marks. Can also be specified using the strokeWidth channel option of text marks. |
| textStroke | A character. Specify the stroke of text marks. Can also be specified using the stroke channel option of text marks. |
| textFontWeight | A character. One of "bold", "normal". Specify the font weight of text marks. |
| textFontSize | A number. Specify the font size of text marks. Can also be specified using the size channel option of text marks. |
| textAnchor | A character. One of "start", "middle", "end". Specify the alignment of text marks to a given point. |
| select | An object returned by event_styles(). Customize visual effects of rangeSelect events on marks. |
| outlineWidth | A number. |
| outline | A character. |
| mouseOver | An object returned by event_styles(). Customize visual effects of mouseOver events on marks. |
| matrixExtent | A character. One of "full", "upper-right", "lower-left". Determine to show only one side of the diagonal in a HiGlass matrix. Default: "full". |
| linkStyle | A character. One of "elliptical", "circular", "straight", "experimentalEdgeBundling". The style of withinLink and betweenLink marks. Default: 'circular' 'elliptical' will be used as a default option. |
| linkMinHeight | A number. The minimum height of withinLink and betweenLink marks. Unit is a percentage Default: 0.5. |
| linkConnectionType | A character. One of "straight", "curve", "corner". Specify the connection type of betweenLink marks. Default: "corner". |
| linePattern | A list of the form list(size="number",type="string"). One of "triangleLeft", "triangleRight".) Specify the pattern of dashes and gaps for rule marks. |
| legendTitle | A character. If defined, show legend title on the top or left. |
| inlineLegend | A Boolean. Specify whether to show legend in a single horizontal line? |
| enableSmoothPath | A Boolean. Whether to enable smooth paths when drawing curves. Default: FALSE. |
| dy | A number. Offset the position of marks in y direction. This property is currently only supported for text marks. |
| dx | A number. Offset the position of marks in x direction. This property is currently only supported for text marks. |
| dashed | An vector of number like c(1, 2). Specify the pattern of dashes and gaps for rule marks. |

| | |
|-------------------|--|
| curve | A character. One of "top", "bottom", "left", "right". Specify the curve of rule marks. |
| brush | An object returned by brush_styles(). Customize the style of the brush mark in the rangeSelect mouse event. |
| backgroundOpacity | A number. |
| background | A character. |
| align | A character. One of "left", "right". Specify the alignment of marks. This property is currently only supported for triangle marks. |
| ... | Any other styles to be passed to gosling.js. |

Details

For more info visit <http://gosling-lang.org/docs/visual-channel/#style-related-properties>

Value

List object with default styles.

Examples

```
if(interactive()) {
  library(shiny)
  library(shiny.gosling)

  track5_styles <- default_track_styles(
    legendTitle = "SV Class"
  )
  track5_data <- track_data(
    url = "https://s3.amazonaws.com/gosling-lang.org/data/cancer/rearrangement.PD35930a.csv",
    type = "csv",
    genomicFieldsToConvert = json_list(
      json_list(
        chromosomeField = "chr1",
        genomicFields = c("start1", "end1")
      ),
      json_list(
        chromosomeField = "chr2",
        genomicFields = c("start2", "end2")
      )
    )
  )
  track5_tracks <- add_multi_tracks(
    add_single_track(
      mark = "rect"
    ),
    add_single_track(
      mark = "withinLink", x = visual_channel_x(linkingId = "mid-scale"),
      strokeWidth = 0
    )
  )
  track5_color <- visual_channel_color(
    field = "svclass",
    type = "nominal",
    legend = TRUE,
  )
}
```

```

domain = json_list(
  "tandem-duplication", "translocation", "deletion", "inversion"
),
range = json_list(
  "#569C4D", "#4C75A2", "#DA5456", "#EA8A2A"
)
)
)
track5_stroke <- visual_channel_stroke(
  field = "svclass",
  type = "nominal",
  domain = json_list(
    "tandem-duplication", "translocation", "deletion", "inversion"
  ),
  range = json_list(
    "#569C4D", "#4C75A2", "#DA5456", "#EA8A2A"
  )
)
)
track5_x <- visual_channel_x(field = "start1", type = "genomic")
track5_xe <- visual_channel_x(field = "end2", type = "genomic")
track5 <- add_single_track(
  id = "track5", title = "Structural Variant",
  data = track5_data, mark = "withinLink",
  x = track5_x, xe = track5_xe,
  color = track5_color, width = 500, height = 80, stroke = track5_stroke,
  strokeWidth = 1, opacity = 0.6, style = track5_styles
)
)

composed_track <- compose_view(
  multi = TRUE,
  tracks = add_multi_tracks(
    track5
  ),
  xOffset = 190, layout = "circular", spacing = 1
)
)

composed_views <- arrange_views(
  views = composed_track,
  arrangement = "vertical"
)
)

ui <- fluidPage(
  use_gosling(),
  fluidRow(
    column(6, goslingOutput("gosling_plot"))
  )
)
)

server <- function(input, output, session) {
  output$gosling_plot <- renderGosling({
    gosling(
      component_id = "component_2",
      composed_views, clean_braces = FALSE
    )
  })
}
}

```

```
    shinyApp(ui, server)
  }
```

event_styles *Mouse event styles*

Description

The styles defined here will be applied to the targets of mouse events, such as a point mark after user click mouse.

Usage

```
event_styles(  
  strokeWidth = NULL,  
  strokeOpacity = NULL,  
  stroke = NULL,  
  opacity = NULL,  
  color = NULL,  
  arrange = NULL  
)
```

Arguments

| | |
|---------------|--|
| strokeWidth | A number. stroke width of the marks when mouse events are triggered. |
| strokeOpacity | A number. |
| stroke | A character. Stroke color of the marks when mouse events are triggered. |
| opacity | A number. Opacity of the marks when mouse events are triggered. |
| color | A character. Color of the marks when mouse events are triggered. |
| arrange | A character. One of "behind", "front". Show event effects behind or in front of marks. |

Details

For more info visit <http://gosling-lang.org/docs/visual-channel/#type-eventstyle>

Value

List object with event styles.

`export_pdf`*Export PDF*

Description

Exports PDF

Usage

```
export_pdf(  
  component_id,  
  transparent_background = FALSE,  
  session = getDefaultReactiveDomain()  
)
```

Arguments

`component_id` A character. The id of the `component_id` prop passed to the `GoslingComponent` function.

`transparent_background` A Boolean. Determine if the background should be transparent or not (Default: `false`).

`session` A shiny session object.

Value

None.

Examples

```
if(interactive()) {  
  library(shiny)  
  library(shiny.gosling)  
  
  cistrome_data <-  
    "https://server.gosling-lang.org/api/v1/tileset_info/?d=cistrome-multivec"  
  
  single_track <- add_single_track(  
    id = "track1",  
    data = track_data(  
      url = cistrome_data,  
      type = "multivec",  
      row = "sample",  
      column = "position",  
      value = "peak",  
      categories = c("sample 1", "sample 2", "sample 3", "sample 4"),  
      binSize = 4,  
    ),  
    mark = "rect",  
    x = visual_channel_x(field = "start", type = "genomic", axis = "top"),  
    xe = visual_channel_x(field = "end", type = "genomic"),  
    row = visual_channel_row(  
      field = "sample",
```

```

    type = "nominal",
    legend = TRUE
  ),
  color = visual_channel_color(
    field = "peak",
    type = "quantitative",
    legend = TRUE
  ),
  tooltip = visual_channel_tooltips(
    visual_channel_tooltip(field = "start", type = "genomic",
                          alt = "Start Position"),
    visual_channel_tooltip(field = "end", type = "genomic",
                          alt = "End Position"),
    visual_channel_tooltip(
      field = "peak",
      type = "quantitative",
      alt = "Value",
      format = "0.2"
    )
  ),
  width = 600,
  height = 130
)

single_composed_track <- compose_view(
  tracks = single_track
)

single_composed_views <- arrange_views(
  title = "Single Track",
  subtitle = "This is the simplest single track visualization with a linear layout",
  layout = "circular", #"linear"
  views = single_composed_track,
  xDomain = list(
    chromosome = "chr1",
    interval = c(1, 3000500)
  )
)

ui <- fluidPage(
  use_gosling(),
  fluidRow(
    column(6, goslingOutput("gosling_plot")),
    column(
      1, br(), actionButton(
        "download_pdf",
        "PDF",
        icon = icon("cloud-arrow-down")
      )
    )
  )
)

server <- function(input, output, session) {
  output$gosling_plot <- renderGosling({
    gosling(

```

```

      component_id = "component_1",
      single_composed_views,
      clean_braces = TRUE
    )
  })

  observeEvent(input$download_pdf, {
    export_pdf(component_id = "component_1")
  })
}

shinyApp(ui, server)
}

```

 export_png

Export PNG

Description

Exports PNG

Usage

```

export_png(
  component_id,
  transparent_background = FALSE,
  session = getDefaultReactiveDomain()
)

```

Arguments

| | |
|------------------------|---|
| component_id | A character. The id of the component_id prop passed to the GoslingComponent function. |
| transparent_background | A Boolean. Determine if the background should be transparent or not (Default: false). |
| session | A shiny session object. |

Value

None.

Examples

```

if(interactive()) {
  library(shiny)
  library(shiny.gosling)

  cistrome_data <-
    "https://server.gosling-lang.org/api/v1/tileset_info/?d=cistrome-multivec"

```



```

single_track <- add_single_track(
  id = "track1",
  data = track_data(
    url = cistrome_data,
    type = "multivec",
    row = "sample",
    column = "position",
    value = "peak",
    categories = c("sample 1", "sample 2", "sample 3", "sample 4"),
    binSize = 4,
  ),
  mark = "rect",
  x = visual_channel_x(field = "start", type = "genomic", axis = "top"),
  xe = visual_channel_x(field = "end", type = "genomic"),
  row = visual_channel_row(
    field = "sample",
    type = "nominal",
    legend = TRUE
  ),
  color = visual_channel_color(
    field = "peak",
    type = "quantitative",
    legend = TRUE
  ),
  tooltip = visual_channel_tooltips(
    visual_channel_tooltip(field = "start", type = "genomic",
      alt = "Start Position"),
    visual_channel_tooltip(field = "end", type = "genomic",
      alt = "End Position"),
    visual_channel_tooltip(
      field = "peak",
      type = "quantitative",
      alt = "Value",
      format = "0.2"
    )
  ),
  width = 600,
  height = 130
)

single_composed_track <- compose_view(
  tracks = single_track
)

single_composed_views <- arrange_views(
  title = "Single Track",
  subtitle = "This is the simplest single track visualization with a linear layout",
  layout = "circular", #"linear"
  views = single_composed_track,
  xDomain = list(
    chromosome = "chr1",
    interval = c(1, 3000500)
  )
)

ui <- fluidPage(
  use_gosling(),

```

```

fluidRow(
  column(6, goslingOutput("gosling_plot")),
  column(
    1, br(), actionButton(
      "download_png",
      "PNG",
      icon = icon("cloud-arrow-down")
    )
  )
)
)
)

server <- function(input, output, session) {
  output$gosling_plot <- renderGosling({
    gosling(
      component_id = "component_1",
      single_composed_views,
      clean_braces = TRUE
    )
  })

  observeEvent(input$download_png, {
    export_png(component_id = "component_1")
  })
}

shinyApp(ui, server)
}

```

get_file_track_data *Track data object builder for local csv files*

Description

Get an object for using local csv to build plots

Usage

```

get_file_track_data(
  file_name,
  chromosomeField = NULL,
  genomicFields = NULL,
  separator = ",",
  sampleLength = 1000,
  headerNames = NULL,
  ...
)

```

Arguments

file_name A character. Specify the file_name.
 chromosomeField A character. Specify the name of chromosome data fields.
 genomicFields A character vector. Specify the name of genomic data fields.
 separator A character. Specify file separator, Default: ','
 sampleLength A number. Specify the number of rows loaded from the URL. Default: 1000
 headerNames A character vector. Specify the names of data fields if a CSV file does not have header row.
 ... Any other parameters passed to json data object.

Value

list of data specs for a local csv file

| | |
|---------|----------------------------------|
| gosling | <i>Build gosling plot object</i> |
|---------|----------------------------------|

Description

Build gosling plot object

Usage

```
gosling(component_id, composed_views, clean_braces = TRUE)
```

Arguments

component_id Assign a component id to use other api like zoom.
 composed_views The views composed with arrange_views.
 clean_braces Whether to remove extra square brackets from the json string.

Value

Gosling component for rendering on R shiny apps

Examples

```
if (interactive()) {
  library(shiny)
  library(shiny.gosling)

  # Circular track 1 ----
  circular_track1_data <- track_data(
    url = "https://server.gosling-lang.org/api/v1/tileset_info/?d=cistrome-multivec",
    type = "multivec",
    row = "sample",
    column = "position",
    value = "peak",
    categories = c("sample 1", "sample 2", "sample 3", "sample 4"),
```

```

    binSize = 4
  )

  circular_track1_x <- visual_channel_x(field = "start", type = "genomic")
  circular_track1_xe <- visual_channel_x(field = "end", type = "genomic")

  circular_track1_y <- visual_channel_y(field = "peak", type = "quantitative")

  circular_track1_row <- visual_channel_row(
    field = "sample", type = "nominal"
  )

  circular_track1_color <- visual_channel_color(
    field = "sample", type = "nominal"
  )

  circular_track1_tracks <- add_multi_tracks(
    add_single_track(
      mark = "bar"
    ),
    add_single_track(
      mark = "brush",
      x = visual_channel_x(linkingId = "detail-1"),
      color = "blue"
    ),
    add_single_track(
      mark = "brush",
      x = visual_channel_x(linkingId = "detail-2"),
      color = "red"
    )
  )

  circular_track1_styles <- default_track_styles(
    outlineWidth = 0
  )

  circular_track1 <- add_single_track(
    id = "circular_track1", alignment = "overlay", data = circular_track1_data,
    x = circular_track1_x, xe = circular_track1_xe,
    y = circular_track1_y, row = circular_track1_row,
    color = circular_track1_color,
    stroke = "black", strokeWidth = 0.3,
    tracks = circular_track1_tracks,
    style = circular_track1_styles,
    width = 500, height = 100
  )

  # Compose Circular track ----
  circular_composed_view <- compose_view(
    multi = TRUE,
    tracks = add_multi_tracks(
      circular_track1
    ),
    static = TRUE, layout = "circular", alignment = "stack"
  )

  # Arrange final view

```

```
circular_linear_view <- arrange_views(
  arrangement = "horizontal",
  views = list(circular_composed_view)
)

ui <- fluidPage(
  use_gosling(),
  fluidRow(
    column(6, goslingOutput("gosling_plot"))
  )
)

server <- function(input, output, session) {
  output$gosling_plot <- renderGosling({
    gosling(
      component_id = "circular_component",
      circular_linear_view, clean_braces = FALSE
    )
  })
}

shinyApp(ui, server)
}
```

| | |
|------------------|---------------------------------|
| GoslingComponent | <i>Create Gosling component</i> |
|------------------|---------------------------------|

Description

Create Gosling component

Usage

```
GoslingComponent(...)
```

Arguments

... Name of component.

Value

A function to create the gosling component.

goslingDependency *Setup gosling dependencies*

Description

Setup gosling dependencies

Usage

```
goslingDependency()
```

Value

list of dependencies for Gosling

goslingOutput *gosling output function*

Description

gosling output function for shiny use. Must use this function instead of shiny output functions.

Usage

```
goslingOutput(outputId)
```

Arguments

outputId ID of the output element

Value

reactOutput HTML for UI render

Examples

```
if(interactive()) {
  library(shiny)
  library(shiny.gosling)

  track5_styles <- default_track_styles(
    legendTitle = "SV Class"
  )
  track5_data <- track_data(
    url = "https://s3.amazonaws.com/gosling-lang.org/data/cancer/rearrangement.PD35930a.csv",
    type = "csv",
    genomicFieldsToConvert = json_list(
      json_list(
        chromosomeField = "chr1",
        genomicFields = c("start1", "end1")
      ),
    ),
```

```

    json_list(
      chromosomeField = "chr2",
      genomicFields = c("start2", "end2")
    )
  )
)
track5_tracks <- add_multi_tracks(
  add_single_track(
    mark = "rect"
  ),
  add_single_track(
    mark = "withinLink", x = visual_channel_x(linkingId = "mid-scale"),
    strokeWidth = 0
  )
)
track5_color <- visual_channel_color(
  field = "svclass",
  type = "nominal",
  legend = TRUE,
  domain = json_list(
    "tandem-duplication", "translocation", "deletion", "inversion"
  ),
  range = json_list(
    "#569C4D", "#4C75A2", "#DA5456", "#EA8A2A"
  )
)
track5_stroke <- visual_channel_stroke(
  field = "svclass",
  type = "nominal",
  domain = json_list(
    "tandem-duplication", "translocation", "deletion", "inversion"
  ),
  range = json_list(
    "#569C4D", "#4C75A2", "#DA5456", "#EA8A2A"
  )
)
track5_x <- visual_channel_x(field = "start1", type = "genomic")
track5_xe <- visual_channel_x(field = "end2", type = "genomic")
track5 <- add_single_track(
  id = "track5", title = "Structural Variant",
  data = track5_data, mark = "withinLink",
  x = track5_x, xe = track5_xe,
  color = track5_color, width = 500, height = 80, stroke = track5_stroke,
  strokeWidth = 1, opacity = 0.6, style = track5_styles
)

composed_track <- compose_view(
  multi = TRUE,
  tracks = add_multi_tracks(
    track5
  ),
  xOffset = 190, layout = "circular", spacing = 1
)

composed_views <- arrange_views(
  views = composed_track,
  arrangement = "vertical"
)

```

```

)

ui <- fluidPage(
  use_gosling(),
  fluidRow(
    column(6, goslingOutput("gosling_plot"))
  )
)

server <- function(input, output, session) {
  output$gosling_plot <- renderGosling({
    gosling(
      component_id = "component_2",
      composed_views, clean_braces = FALSE
    )
  })
}

shinyApp(ui, server)
}

```

| | |
|-----------------|------------------------|
| is_atomic_field | <i>is_atomic_field</i> |
|-----------------|------------------------|

Description

is_atomic_field

Usage

```
is_atomic_field(field_name)
```

Arguments

field_name A character or number or another atomic value.

Value

List.

| | |
|-----------|--------------------|
| json_list | <i>Create list</i> |
|-----------|--------------------|

Description

Create list

Usage

```
json_list(...)
```


Arguments

... Items to be put in a list

Value

list of items

Examples

```
if (interactive()) {
  library(shiny)
  library(shiny.gosling)

  track5_styles <- default_track_styles(
    legendTitle = "SV Class"
  )
  track5_data <- track_data(
    url = "https://s3.amazonaws.com/gosling-lang.org/data/cancer/rearrangement.PD35930a.csv",
    type = "csv",
    genomicFieldsToConvert = json_list(
      json_list(
        chromosomeField = "chr1",
        genomicFields = c("start1", "end1")
      ),
      json_list(
        chromosomeField = "chr2",
        genomicFields = c("start2", "end2")
      )
    )
  )
  track5_tracks <- add_multi_tracks(
    add_single_track(
      mark = "rect"
    ),
    add_single_track(
      mark = "withinLink", x = visual_channel_x(linkingId = "mid-scale"),
      strokeWidth = 0
    )
  )
  track5_color <- visual_channel_color(
    field = "svclass",
    type = "nominal",
    legend = TRUE,
    domain = json_list(
      "tandem-duplication", "translocation", "deletion", "inversion"
    ),
    range = json_list(
      "#569C4D", "#4C75A2", "#DA5456", "#EA8A2A"
    )
  )
  track5_stroke <- visual_channel_stroke(
    field = "svclass",
    type = "nominal",
    domain = json_list(
      "tandem-duplication", "translocation", "deletion", "inversion"
    ),
  )
}
```

```

    range = json_list(
      "#569C4D", "#4C75A2", "#DA5456", "#EA8A2A"
    )
  )
  track5_x <- visual_channel_x(field = "start1", type = "genomic")
  track5_xe <- visual_channel_x(field = "end2", type = "genomic")
  track5 <- add_single_track(
    id = "track5", title = "Structural Variant",
    data = track5_data, mark = "withinLink",
    x = track5_x, xe = track5_xe,
    color = track5_color, width = 500, height = 80, stroke = track5_stroke,
    strokeWidth = 1, opacity = 0.6, style = track5_styles
  )

  composed_track <- compose_view(
    multi = TRUE,
    tracks = add_multi_tracks(
      track5
    ),
    xOffset = 190, layout = "circular", spacing = 1
  )

  composed_views <- arrange_views(
    views = composed_track,
    arrangement = "vertical"
  )

  ui <- fluidPage(
    use_gosling(),
    fluidRow(
      column(6, goslingOutput("gosling_plot"))
    )
  )

  server <- function(input, output, session) {
    output$gosling_plot <- renderGosling({
      gosling(
        component_id = "component_2",
        composed_views, clean_braces = FALSE
      )
    })
  }

  shinyApp(ui, server)
}

```

list_rm_null

Remove null from list

Description

Remove null from list

Usage

```
list_rm_null(r_list)
```

Arguments

`r_list` An r list with NULL values

Value

r list without NULL values

| | |
|---------------|---|
| print.gosling | <i>Print method for the gosling component</i> |
|---------------|---|

Description

Print method for the gosling component

Usage

```
## S3 method for class 'gosling'
print(x, ...)
```

Arguments

`x` A gosling object
`...` further arguments passed to or from other methods.

Value

r list without NULL values

| | |
|---------------|--------------------------------|
| renderGosling | <i>gosling render function</i> |
|---------------|--------------------------------|

Description

gosling render function for shiny use

Usage

```
renderGosling(expr, env = parent.frame(), quoted = FALSE)
```

Arguments

`expr` Expression returning the HTML / 'React' to render.
`env` Environment in which to evaluate expr.
`quoted` Is expr a quoted expression?

Value

A function which can be assigned to an output in a Shiny server function.

Examples

```

if(interactive()) {
  library(shiny)
  library(shiny.gosling)

  track5_styles <- default_track_styles(
    legendTitle = "SV Class"
  )
  track5_data <- track_data(
    url = "https://s3.amazonaws.com/gosling-lang.org/data/cancer/rearrangement.PD35930a.csv",
    type = "csv",
    genomicFieldsToConvert = json_list(
      json_list(
        chromosomeField = "chr1",
        genomicFields = c("start1", "end1")
      ),
      json_list(
        chromosomeField = "chr2",
        genomicFields = c("start2", "end2")
      )
    )
  )
  track5_tracks <- add_multi_tracks(
    add_single_track(
      mark = "rect"
    ),
    add_single_track(
      mark = "withinLink", x = visual_channel_x(linkingId = "mid-scale"),
      strokeWidth = 0
    )
  )
  track5_color <- visual_channel_color(
    field = "svclass",
    type = "nominal",
    legend = TRUE,
    domain = json_list(
      "tandem-duplication", "translocation", "deletion", "inversion"
    ),
    range = json_list(
      "#569C4D", "#4C75A2", "#DA5456", "#EA8A2A"
    )
  )
  track5_stroke <- visual_channel_stroke(
    field = "svclass",
    type = "nominal",
    domain = json_list(
      "tandem-duplication", "translocation", "deletion", "inversion"
    ),
    range = json_list(
      "#569C4D", "#4C75A2", "#DA5456", "#EA8A2A"
    )
  )
}

```

```
track5_x <- visual_channel_x(field = "start1", type = "genomic")
track5_xe <- visual_channel_x(field = "end2", type = "genomic")
track5 <- add_single_track(
  id = "track5", title = "Structural Variant",
  data = track5_data, mark = "withinLink",
  x = track5_x, xe = track5_xe,
  color = track5_color, width = 500, height = 80, stroke = track5_stroke,
  strokeWidth = 1, opacity = 0.6, style = track5_styles
)

composed_track <- compose_view(
  multi = TRUE,
  tracks = add_multi_tracks(
    track5
  ),
  xOffset = 190, layout = "circular", spacing = 1
)

composed_views <- arrange_views(
  views = composed_track,
  arrangement = "vertical"
)

ui <- fluidPage(
  use_gosling(),
  fluidRow(
    column(6, goslingOutput("gosling_plot"))
  )
)

server <- function(input, output, session) {
  output$gosling_plot <- renderGosling({
    gosling(
      component_id = "component_2",
      composed_views, clean_braces = FALSE
    )
  })
}

shinyApp(ui, server)
}
```

run_example

Runs a shiny.gosling example

Description

Runs a shiny.gosling example

Usage

```
run_example(example = NA)
```

Arguments

example A character indicating a valid example.

Value

A Shiny App is launched.

Examples

```
if (interactive()) {
  run_example("circularLinearWithBrush")
}
```

track_data

Data object builder

Description

Build the data object for gosling plots

Usage

```
track_data(
  url = NULL,
  type,
  separator = NULL,
  sampleLength = NULL,
  headerNames = NULL,
  genomicFields = NULL,
  chromosomeField = NULL,
  genomicFieldsToConvert = NULL,
  ...
)
```

Arguments

url A character. Specify the URL address of the data file.

type A character. Type of data. One of "csv", "json", "bigwig", "bam", "vcf", "vector", "multivec" and "beddb". For usage refer to <http://gosling-lang.org/docs/data#supported-data-formats>.

separator A character. Specify file separator, Default: ','

sampleLength A number. Specify the number of rows loaded from the URL. Default: 1000

headerNames A character vector. Specify the names of data fields if a CSV file does not have header row.

genomicFields A character vector. Specify the name of genomic data fields.

chromosomeField A character. Specify the name of chromosome data fields.

genomicFieldsToConvert Define the genomic fields from the data in list format. Experimental Property. Each object follows the format "chromosomeField":"string","genomicFields":"string[]"
()

... Any other parameters passed to json data object.

Details

For info visit <http://gosling-lang.org/docs/data>. Check the various supported data formats and their parameters. All of them can be constructed using this function.

Value

list of data specs

Examples

```
if (interactive()) {
  library(shiny)
  library(shiny.gosling)

  # View 2 Track 3----
  view2_track3_data <- track_data(
    url = "https://server.gosling-lang.org/api/v1/tileset_info/?d=NC_045512_2-multivec",
    type = "multivec",
    row = "base",
    column = "position",
    value = "count",
    categories = c("A", "T", "G", "C"),
    start = "start",
    end = "end"
  )

  view2_track3a <- add_single_track(
    mark = "bar",
    y = visual_channel_y(
      field = "count", type = "quantitative", axis = "none"
    )
  )

  view2_track3b <- add_single_track(
    dataTransform = track_data_transform(
      type = "filter",
      field = "count",
      oneOf = list(),
      not = TRUE
    ),
    mark = "text",
    x = visual_channel_x(
      field = "start", type = "genomic"
    ),
    xe = visual_channel_x(
      field = "end", type = "genomic"
    ),
    size = 24,
    color = "white",
    visibility = list(
      list(
        operation = "less-than",
        measure = "width",
        threshold = "|xe-x|",
        transitionPadding = 30,
        target = "mark"
      )
    )
  )
}
```

```

    ),
    list(
      operation = "LT",
      measure = "zoomLevel",
      threshold = 40,
      target = "track"
    )
  )
)

view2_track3_x <- visual_channel_x(
  field = "position", type = "genomic"
)

view2_track3_color <- visual_channel_color(
  field = "base",
  type = "nominal",
  domain = c("A", "T", "G", "C"),
  legend = TRUE
)

view2_track3_text <- visual_channel_text(
  field = "base", type = "nominal"
)

view2_track3_style <- default_track_styles(
  inlineLegend = TRUE
)

view2_track3 <- add_single_track(
  title = "NC_045512.2 Sequence",
  alignment = "overlay",
  data = view2_track3_data,
  tracks = add_multi_tracks(
    view2_track3a, view2_track3b
  ),
  x = view2_track3_x,
  color = view2_track3_color,
  text = view2_track3_text,
  style = view2_track3_style,
  width = 800, height = 40
)

view2 <- compose_view(
  multi = TRUE,
  centerRadius = 0,
  xDomain = list(interval = c(1, 29903)),
  linkingId = "detail",
  alignment = "stack",
  tracks = add_multi_tracks(
    view2_track3
  )
)

combined_view <- arrange_views(
  title = "SARS-CoV-2",
  subtitle = "Data Source: WashU Virus Genome Browser, NCBI, GISAID",

```



```

    assembly = list(list("NC_045512.2", 29903)),
    layout = "linear",
    spacing = 50,
    views = list(view2),
    listify = FALSE
  )

  ui <- fluidPage(
    use_gosling(),
    fluidRow(
      column(6, goslingOutput("gosling_plot"))
    )
  )

  server <- function(input, output, session) {
    output$gosling_plot <- renderGosling({
      gosling(
        component_id = "sars_cov2",
        combined_view
      )
    })
  }

  shinyApp(ui, server)
}

```

track_data_csv

Data object builder for a csv file

Description

Build the data object for gosling plots

Usage

```

track_data_csv(
  file,
  genomicFields = NULL,
  chromosomeField = NULL,
  separator = ",",
  sampleLength = 1000,
  headerNames = NULL,
  ...
)

```

Arguments

| | |
|-----------------|--|
| file | A character. Specify the URL address or local file name in the www directory of the data file. |
| genomicFields | A character vector. Specify the name of genomic data fields. |
| chromosomeField | A character. Specify the name of chromosome data fields. |

| | |
|--------------|--|
| separator | A character. Specify file separator, Default: ',' |
| sampleLength | A number. Specify the number of rows loaded from the URL. Default: 1000 |
| headerNames | A character vector. Specify the names of data fields if a CSV file does not have header row. |
| ... | Any other parameters passed to json data object. |

Value

list of data specs for a csv file

Examples

```

if (interactive()) {
  library(shiny.gosling)
  library(shiny)
  library(GenomicRanges)

  url <- "https://rb.gy/7y3fx"
  temp_file <- file.path(tempdir(), "GSM1295076_CBX6_BF_ChipSeq_mergedReps_peaks.bed.gz")
  download.file(url, destfile = temp_file)
  df <- read.delim(
    temp_file,
    header = FALSE,
    comment.char = "#"
  )
  gr <- GRanges(
    seqnames = df$V1,
    ranges = IRanges(df$V2, df$V3)
  )

  if (!dir.exists("data")) {
    dir.create("data")
  }
  utils::write.csv(gr, "data/ChipSeqPeaks.csv", row.names = FALSE)

  ui <- fluidPage(
    use_gosling(clear_files = FALSE),
    goslingOutput("gosling_plot")
  )

  track_1 <- add_single_track(
    width = 800,
    height = 180,
    data = track_data_csv(
      "data/ChipSeqPeaks.csv", chromosomeField = "seqnames",
      genomicFields = c("start", "end")
    ),
    mark = "bar",
    x = visual_channel_x(
      field = "start", type = "genomic", axis = "bottom"
    ),
    xe = visual_channel_x(field = "end", type = "genomic"),
    y = visual_channel_y(
      field = "width", type = "quantitative", axis = "right"
    ),
    size = list(value = 5)
  )

```

```

)

composed_view <- compose_view(
  layout = "linear",
  tracks = track_1
)

arranged_view <- arrange_views(
  title = "Basic Marks: bar",
  subtitle = "Tutorial Examples",
  views = composed_view
)

server <- function(input, output, session) {
  output$gosling_plot <- renderGosling({
    gosling(
      component_id = "component_1",
      arranged_view
    )
  })
}

shiny::shinyApp(ui, server)
}

```

track_data_gr

Data object builder for a GRanges object by locally saving it

Description

Build the data object for gosling plots

Usage

```

track_data_gr(
  granges,
  chromosomeField = NULL,
  genomicFields = NULL,
  separator = ",",
  sampleLength = 1000,
  headerNames = NULL,
  ...
)

```

Arguments

| | |
|-----------------|--|
| granges | A GRanges object from the GenomicRanges package with seqnames and ranges |
| chromosomeField | A character. Specify the name of chromosome data fields. |
| genomicFields | A character vector. Specify the name of genomic data fields. |
| separator | A character. Specify file separator, Default: ',' |

| | |
|--------------|--|
| sampleLength | A number. Specify the number of rows loaded from the URL. Default: 1000 |
| headerNames | A character vector. Specify the names of data fields if a CSV file does not have header row. |
| ... | Any other parameters passed to json data object. |

Value

list of data specs for a csv file

Examples

```

if (interactive()) {
  library(shiny.gosling)
  library(shiny)
  library(GenomicRanges)

  url <- "https://rb.gy/7y3fx"
  temp_file <- file.path(tempdir(), "GSM1295076_CBX6_BF_ChipSeq_mergedReps_peaks.bed.gz")
  download.file(url, destfile = temp_file)
  df <- read.delim(
    temp_file,
    header = FALSE,
    comment.char = "#"
  )
  gr <- GRanges(
    seqnames = df$V1,
    ranges = IRanges(df$V2, df$V3)
  )

  ui <- fluidPage(
    use_gosling(clear_files = FALSE),
    goslingOutput("gosling_plot")
  )

  track_1 <- add_single_track(
    width = 800,
    height = 180,
    data = track_data_gr(
      gr, chromosomeField = "seqnames",
      genomicFields = c("start", "end")
    ),
    mark = "bar",
    x = visual_channel_x(
      field = "start", type = "genomic", axis = "bottom"
    ),
    xe = visual_channel_x(field = "end", type = "genomic"),
    y = visual_channel_y(
      field = "width", type = "quantitative", axis = "right"
    ),
    size = list(value = 5)
  )

  composed_view <- compose_view(
    layout = "linear",
    tracks = track_1
  )
}

```

```

arranged_view <- arrange_views(
  title = "Basic Marks: bar",
  subtitle = "Tutorial Examples",
  views = composed_view
)

server <- function(input, output, session) {
  output$gosling_plot <- renderGosling({
    gosling(
      component_id = "component_1",
      arranged_view
    )
  })
}

shiny::shinyApp(ui, server)
}

```

track_data_transform *Data transformer*

Description

Do data transformations

Usage

```
track_data_transform(type = NULL, field = NULL, oneOf = NULL, not = NULL, ...)
```

Arguments

| | |
|-------|--|
| type | A character. One of "filter", "concat", "replace", "log", "displace", "exonSplit", "coverage", "genomicLength", "svType" and "subjson". Check usage details at http://gosling-lang.org/docs/data/#data-transform . |
| field | A character. filter is applied based on the values of the specified data field. |
| oneOf | A vector of characters or numbers. Check whether the value is an element in the provided list. |
| not | A Boolean. When "not": true, apply a NOT logical operation to the filter. Default: false. |
| ... | Any other parameters to pass to gosling.js. |

Details

For info visit <http://gosling-lang.org/docs/data#data-transform> There are multiple ways to transform data. Check documentation for details of usage.

Value

list of data transformations specs

Examples

```

if (interactive()) {
  library(shiny)
  library(shiny.gosling)

  # View 2 Track 3----
  view2_track3_data <- track_data(
    url = "https://server.gosling-lang.org/api/v1/tileset_info/?d=NC_045512_2-multivec",
    type = "multivec",
    row = "base",
    column = "position",
    value = "count",
    categories = c("A", "T", "G", "C"),
    start = "start",
    end = "end"
  )

  view2_track3a <- add_single_track(
    mark = "bar",
    y = visual_channel_y(
      field = "count", type = "quantitative", axis = "none"
    )
  )

  view2_track3b <- add_single_track(
    dataTransform = track_data_transform(
      type = "filter",
      field = "count",
      oneOf = list(),
      not = TRUE
    ),
    mark = "text",
    x = visual_channel_x(
      field = "start", type = "genomic"
    ),
    xe = visual_channel_x(
      field = "end", type = "genomic"
    ),
    size = 24,
    color = "white",
    visibility = list(
      list(
        operation = "less-than",
        measure = "width",
        threshold = "|xe-x|",
        transitionPadding = 30,
        target = "mark"
      ),
      list(
        operation = "LT",
        measure = "zoomLevel",
        threshold = 40,
        target = "track"
      )
    )
  )
}

```

```
view2_track3_x <- visual_channel_x(  
  field = "position", type = "genomic"  
)  
  
view2_track3_color <- visual_channel_color(  
  field = "base",  
  type = "nominal",  
  domain = c("A", "T", "G", "C"),  
  legend = TRUE  
)  
  
view2_track3_text <- visual_channel_text(  
  field = "base", type = "nominal"  
)  
  
view2_track3_style <- default_track_styles(  
  inlineLegend = TRUE  
)  
  
view2_track3 <- add_single_track(  
  title = "NC_045512.2 Sequence",  
  alignment = "overlay",  
  data = view2_track3_data,  
  tracks = add_multi_tracks(  
    view2_track3a, view2_track3b  
  ),  
  x = view2_track3_x,  
  color = view2_track3_color,  
  text = view2_track3_text,  
  style = view2_track3_style,  
  width = 800, height = 40  
)  
  
view2 <- compose_view(  
  multi = TRUE,  
  centerRadius = 0,  
  xDomain = list(interval = c(1, 29903)),  
  linkingId = "detail",  
  alignment = "stack",  
  tracks = add_multi_tracks(  
    view2_track3  
  )  
)  
  
combined_view <- arrange_views(  
  title = "SARS-CoV-2",  
  subtitle = "Data Source: WashU Virus Genome Browser, NCBI, GISAID",  
  assembly = list(list("NC_045512.2", 29903)),  
  layout = "linear",  
  spacing = 50,  
  views = list(view2),  
  listify = FALSE  
)  
  
ui <- fluidPage(  
  use_gosling(),
```

```

    fluidRow(
      column(6, goslingOutput("gosling_plot"))
    )
  )

  server <- function(input, output, session) {
    output$gosling_plot <- renderGosling({
      gosling(
        component_id = "sars_cov2",
        combined_view
      )
    })
  }

  shinyApp(ui, server)
}

```

track_data_transforms *Combine multiple data transforms*

Description

Combine multiple data transforms

Usage

```
track_data_transforms(...)
```

Arguments

... Multiple data transform specs separated by comma.

Value

list of multiple data transform specs

use_gosling *Initiate gosling*

Description

Add this function at the beginning of ui. This is needed for gosling to work in shiny plots.

Usage

```
use_gosling(clear_files = TRUE)
```

Arguments

clear_files default FALSE. To clear the locally stored csv files created by gosling or not.

Value

Gosling initiator HTML.

Examples

```

if (interactive()) {
  library(shiny)
  library(shiny.gosling)

  track5_styles <- default_track_styles(
    legendTitle = "SV Class"
  )
  track5_data <- track_data(
    url = "https://s3.amazonaws.com/gosling-lang.org/data/cancer/rearrangement.PD35930a.csv",
    type = "csv",
    genomicFieldsToConvert = json_list(
      json_list(
        chromosomeField = "chr1",
        genomicFields = c("start1", "end1")
      ),
      json_list(
        chromosomeField = "chr2",
        genomicFields = c("start2", "end2")
      )
    )
  )
  track5_tracks <- add_multi_tracks(
    add_single_track(
      mark = "rect"
    ),
    add_single_track(
      mark = "withinLink", x = visual_channel_x(linkingId = "mid-scale"),
      strokeWidth = 0
    )
  )
  track5_color <- visual_channel_color(
    field = "svclass",
    type = "nominal",
    legend = TRUE,
    domain = json_list(
      "tandem-duplication", "translocation", "deletion", "inversion"
    ),
    range = json_list(
      "#569C4D", "#4C75A2", "#DA5456", "#EA8A2A"
    )
  )
  track5_stroke <- visual_channel_stroke(
    field = "svclass",
    type = "nominal",
    domain = json_list(
      "tandem-duplication", "translocation", "deletion", "inversion"
    ),
    range = json_list(
      "#569C4D", "#4C75A2", "#DA5456", "#EA8A2A"
    )
  )
}

```

```

track5_x <- visual_channel_x(field = "start1", type = "genomic")
track5_xe <- visual_channel_x(field = "end2", type = "genomic")
track5 <- add_single_track(
  id = "track5", title = "Structural Variant",
  data = track5_data, mark = "withinLink",
  x = track5_x, xe = track5_xe,
  color = track5_color, width = 500, height = 80, stroke = track5_stroke,
  strokeWidth = 1, opacity = 0.6, style = track5_styles
)

composed_track <- compose_view(
  multi = TRUE,
  tracks = add_multi_tracks(
    track5
  ),
  xOffset = 190, layout = "circular", spacing = 1
)

composed_views <- arrange_views(
  views = composed_track,
  arrangement = "vertical"
)

ui <- fluidPage(
  use_gosling(),
  fluidRow(
    column(6, goslingOutput("gosling_plot"))
  )
)

server <- function(input, output, session) {
  output$gosling_plot <- renderGosling({
    gosling(
      component_id = "component_2",
      composed_views, clean_braces = FALSE
    )
  })
}

shinyApp(ui, server)
}

```

visual_channel

Generic visual channel builder

Description

Generic visual channel builder

Usage

```
visual_channel(field = NULL, type = NULL, range = NULL, domain = NULL, ...)
```

Arguments

| | |
|--------|--|
| field | A character. Name of the data field. |
| type | A character. Must be "genomic". Specify the data type. |
| range | A vector of characters or numbers. Values of the visual channel. |
| domain | A vector of characters or numbers. Values of the data. |
| ... | Any other parameters to pass to gosling.js. |

Details

For more info visit <http://gosling-lang.org/docs/visual-channel#encode-a-visual-channel>

Value

List object.

visual_channel_color *color visual channel*

Description

color visual channel

Usage

```
visual_channel_color(
  field = NULL,
  title = NULL,
  type = NULL,
  scaleOffset = NULL,
  scale = NULL,
  legend = NULL,
  grid = NULL,
  axis = NULL,
  aggregate = NULL,
  ...
)
```

Arguments

| | |
|-------------|--|
| field | A character. Name of the data field. |
| title | A character. Title of the legend. Default: undefined. |
| type | A character. Must be "genomic". Specify the data type. |
| scaleOffset | A number vector of the form c(1, 2). Whether to use offset of the domain proportionally. This is bound to brushes on the color legend. Default: c(0, 1). |
| scale | A character. One of "linear", "log". |
| legend | A Boolean. Whether to display legend. Default: FALSE. |
| grid | A Boolean. Whether to display grid. Default: FALSE. |

| | |
|-----------|--|
| axis | A character. One of "none", "top", "bottom", "left", "right". Specify where should the axis be put. |
| aggregate | A character. One of "max", "min", "mean", "bin", "count". Specify how to aggregate data. Default: undefined. |
| ... | Any other parameters to pass to gosling.js. |

Details

For more info visit <http://gosling-lang.org/docs/visual-channel#color>

Value

List object.

Examples

```
if(interactive()) {
  library(shiny)
  library(shiny.gosling)

  # View 2 Track 3----
  view2_track3_data <- track_data(
    url = "https://server.gosling-lang.org/api/v1/tileset_info/?d=NC_045512_2-multivec",
    type = "multivec",
    row = "base",
    column = "position",
    value = "count",
    categories = c("A", "T", "G", "C"),
    start = "start",
    end = "end"
  )

  view2_track3a <- add_single_track(
    mark = "bar",
    y = visual_channel_y(
      field = "count", type = "quantitative", axis = "none"
    )
  )

  view2_track3b <- add_single_track(
    dataTransform = track_data_transform(
      type = "filter",
      field = "count",
      oneOf = list(),
      not = TRUE
    ),
    mark = "text",
    x = visual_channel_x(
      field = "start", type = "genomic"
    ),
    xe = visual_channel_x(
      field = "end", type = "genomic"
    ),
    size = 24,
    color = "white",
    visibility = list(list(
```

```

        operation = "less-than",
        measure = "width",
        threshold = "|x<-x|",
        transitionPadding = 30,
        target = "mark"
    ),
    list(
        operation = "LT",
        measure = "zoomLevel",
        threshold = 40,
        target = "track"
    ))
)

view2_track3_x <- visual_channel_x(
  field = "position", type = "genomic"
)

view2_track3_color <- visual_channel_color(
  field = "base",
  type = "nominal",
  domain = c("A", "T", "G", "C"),
  legend = TRUE
)

view2_track3_text <- visual_channel_text(
  field = "base", type = "nominal"
)

view2_track3_style <- default_track_styles(
  inlineLegend = TRUE
)

view2_track3 <- add_single_track(
  title = "NC_045512.2 Sequence",
  alignment = "overlay",
  data = view2_track3_data,
  tracks = add_multi_tracks(
    view2_track3a, view2_track3b
  ),
  x = view2_track3_x,
  color = view2_track3_color,
  text = view2_track3_text,
  style = view2_track3_style,
  width = 800, height = 40
)

view2 <- compose_view(
  multi = TRUE,
  centerRadius = 0,
  xDomain = list(interval = c(1, 29903)),
  linkingId = "detail",
  alignment = "stack",
  tracks = add_multi_tracks(
    view2_track3
  )
)

```

```

combined_view <- arrange_views(
  title = "SARS-CoV-2",
  subtitle = "Data Source: WashU Virus Genome Browser, NCBI, GISAID",
  assembly = list(list("NC_045512.2", 29903)),
  layout = "linear",
  spacing = 50,
  views = list(view2),
  listify = FALSE
)

ui <- fluidPage(
  use_gosling(),
  fluidRow(
    column(6, goslingOutput("gosling_plot"))
  )
)

server <- function(input, output, session) {
  output$gosling_plot <- renderGosling({
    gosling(
      component_id = "sars_cov2",
      combined_view
    )
  })
}

shinyApp(ui, server)
}

```

visual_channel_opacity

opacity visual channel

Description

opacity visual channel

Usage

```

visual_channel_opacity(
  field = NULL,
  type = NULL,
  range = NULL,
  domain = NULL,
  ...
)

```

Arguments

| | |
|--------|--|
| field | A character. Name of the data field. |
| type | A character. Must be "genomic". Specify the data type. |
| range | A vector of characters or numbers. Values of the visual channel. |
| domain | A vector of characters or numbers. Values of the data. |
| ... | Any other parameters to pass to gosling.js. |

Details

For more info visit <http://gosling-lang.org/docs/visual-channel#opacity>

Value

List object.

| | |
|--------------------|---------------------------|
| visual_channel_row | <i>row visual channel</i> |
|--------------------|---------------------------|

Description

row visual channel

Usage

```
visual_channel_row(
  field = NULL,
  type = NULL,
  padding = NULL,
  legend = NULL,
  grid = NULL,
  clip = NULL,
  axis = NULL,
  aggregate = NULL,
  ...
)
```

Arguments

| | |
|-----------|---|
| field | A character. Name of the data field. |
| type | A character. Must be "genomic". Specify the data type. |
| padding | A number. Determines the size of inner white spaces on the top and bottom of individual rows. Default: 0. |
| legend | A Boolean. Whether to display legend. Default: FALSE. |
| grid | A Boolean. Whether to display grid. Default: FALSE. |
| clip | A Boolean. Clip row when the actual y value exceeds the max value of the y scale. Used only for bar marks at the moment. Default: TRUE. |
| axis | A character. One of "none", "top", "bottom", "left", "right". Specify where should the axis be put. |
| aggregate | A character. One of "max", "min", "mean", "bin", "count". Specify how to aggregate data. Default: undefined. |
| ... | Any other parameters to pass to gosling.js. |

Details

For more info visit <http://gosling-lang.org/docs/visual-channel#row>

Value

List object.

Examples

```
if(interactive()) {
  library(shiny)
  library(shiny.gosling)

  # Circular track 1 ----
  circular_track1_data <- track_data(
    url = "https://server.gosling-lang.org/api/v1/tileset_info/?d=cistrome-multivec",
    type = "multivec",
    row = "sample",
    column = "position",
    value = "peak",
    categories = c("sample 1", "sample 2", "sample 3", "sample 4"),
    binSize = 4
  )

  circular_track1_x <- visual_channel_x(field = "start", type = "genomic")
  circular_track1_xe <- visual_channel_x(field = "end", type = "genomic")

  circular_track1_y <- visual_channel_y(field = "peak", type = "quantitative")

  circular_track1_row <- visual_channel_row(
    field = "sample", type = "nominal"
  )

  circular_track1_color <- visual_channel_color(
    field = "sample", type = "nominal"
  )

  circular_track1_tracks <- add_multi_tracks(
    add_single_track(
      mark = "bar"
    ),
    add_single_track(
      mark = "brush",
      x = visual_channel_x(linkingId = "detail-1"),
      color = "blue"
    ),
    add_single_track(
      mark = "brush",
      x = visual_channel_x(linkingId = "detail-2"),
      color = "red"
    )
  )

  circular_track1_styles <- default_track_styles(
    outlineWidth = 0
  )
}
```



```

circular_track1 <- add_single_track(
  id = "circular_track1", alignment = "overlay", data = circular_track1_data,
  x = circular_track1_x, xe = circular_track1_xe,
  y = circular_track1_y, row = circular_track1_row,
  color = circular_track1_color,
  stroke = "black", strokeWidth = 0.3,
  tracks = circular_track1_tracks,
  style = circular_track1_styles,
  width = 500, height = 100
)

# Compose Circular track ----
circular_composed_view <- compose_view(
  multi = TRUE,
  tracks = add_multi_tracks(
    circular_track1
  ),
  static = TRUE, layout = "circular", alignment = "stack"
)

# Arrange final view
circular_linear_view <- arrange_views(
  arrangement = "horizontal",
  views = list(circular_composed_view)
)

ui <- fluidPage(
  use_gosling(),
  fluidRow(
    column(6, goslingOutput("gosling_plot"))
  )
)

server <- function(input, output, session) {
  output$gosling_plot <- renderGosling({
    gosling(
      component_id = "circular_component",
      circular_linear_view, clean_braces = FALSE
    )
  })
}

shinyApp(ui, server)
}

```

Description

size visual channel

Usage

```
visual_channel_size(
  field = NULL,
  type = NULL,
  range = NULL,
  domain = NULL,
  ...
)
```

Arguments

| | |
|--------|---|
| field | A character. Name of the data field. |
| type | A character. Must be "genomic". Specify the data type. |
| range | A vector of characters or numbers. Values of the visual channel. Range to be specified like range = c(min_size, max_size) |
| domain | A vector of characters or numbers. Values of the data. |
| ... | Any other parameters to pass to gosling.js. |

Details

For more info visit <http://gosling-lang.org/docs/visual-channel#size>

Value

List object.

visual_channel_stroke *stroke visual channel*

Description

stroke visual channel

Usage

```
visual_channel_stroke(
  field = NULL,
  title = NULL,
  type = NULL,
  scaleOffset = NULL,
  legend = NULL,
  grid = NULL,
  axis = NULL,
  aggregate = NULL,
  ...
)
```

Arguments

| | |
|-------------|--|
| field | A character. Name of the data field. |
| title | A character. Title of the legend. Default: undefined. |
| type | A character. Must be "genomic". Specify the data type. |
| scaleOffset | A number vector of the form c(1, 2). Whether to use offset of the domain proportionally. This is bound to brushes on the color legend. Default: c(0, 1). |
| legend | A Boolean. Whether to display legend. Default: FALSE. |
| grid | A Boolean. Whether to display grid. Default: FALSE. |
| axis | A character. One of "none", "top", "bottom", "left", "right". Specify where should the axis be put. |
| aggregate | A character. One of "max", "min", "mean", "bin", "count". Specify how to aggregate data. Default: undefined. |
| ... | Any other parameters to pass to gosling.js. |

Details

For more info visit <http://gosling-lang.org/docs/visual-channel#stroke>

Value

List object.

Examples

```
if(interactive()) {
  library(shiny)
  library(shiny.gosling)

  track5_styles <- default_track_styles(
    legendTitle = "SV Class"
  )
  track5_data <- track_data(
    url = "https://s3.amazonaws.com/gosling-lang.org/data/cancer/rearrangement.PD35930a.csv",
    type = "csv",
    genomicFieldsToConvert = json_list(
      json_list(
        chromosomeField = "chr1",
        genomicFields = c("start1", "end1")
      ),
      json_list(
        chromosomeField = "chr2",
        genomicFields = c("start2", "end2")
      )
    )
  )
  track5_tracks <- add_multi_tracks(
    add_single_track(
      mark = "rect"
    ),
    add_single_track(
      mark = "withinLink", x = visual_channel_x(linkingId = "mid-scale"),
      strokeWidth = 0
    )
  )
}
```

```

)
track5_color <- visual_channel_color(
  field = "svclass",
  type = "nominal",
  legend = TRUE,
  domain = json_list(
    "tandem-duplication", "translocation", "deletion", "inversion"
  ),
  range = json_list(
    "#569C4D", "#4C75A2", "#DA5456", "#EA8A2A"
  )
)
track5_stroke <- visual_channel_stroke(
  field = "svclass",
  type = "nominal",
  domain = json_list(
    "tandem-duplication", "translocation", "deletion", "inversion"
  ),
  range = json_list(
    "#569C4D", "#4C75A2", "#DA5456", "#EA8A2A"
  )
)
track5_x <- visual_channel_x(field = "start1", type = "genomic")
track5_xe <- visual_channel_x(field = "end2", type = "genomic")
track5 <- add_single_track(
  id = "track5", title = "Structural Variant",
  data = track5_data, mark = "withinLink",
  x = track5_x, xe = track5_xe,
  color = track5_color, width = 500, height = 80, stroke = track5_stroke,
  strokeWidth = 1, opacity = 0.6, style = track5_styles
)

composed_track <- compose_view(
  multi = TRUE,
  tracks = add_multi_tracks(
    track5
  ),
  xOffset = 190, layout = "circular", spacing = 1
)

composed_views <- arrange_views(
  views = composed_track,
  arrangement = "vertical"
)

ui <- fluidPage(
  use_gosling(),
  fluidRow(
    column(6, goslingOutput("gosling_plot"))
  )
)

server <- function(input, output, session) {
  output$gosling_plot <- renderGosling({
    gosling(
      component_id = "component_2",

```

```
        composed_views, clean_braces = FALSE
      )
    })
  }

  shinyApp(ui, server)
}
```

visual_channel_stroke_width
stroke width visual channel

Description

stroke width visual channel

Usage

```
visual_channel_stroke_width(  
  field = NULL,  
  type = NULL,  
  range = NULL,  
  domain = NULL,  
  ...  
)
```

Arguments

| | |
|--------|--|
| field | A character. Name of the data field. |
| type | A character. Must be "genomic". Specify the data type. |
| range | A vector of characters or numbers. Values of the visual channel. |
| domain | A vector of characters or numbers. Values of the data. |
| ... | Any other parameters to pass to gosling.js. |

Details

For more info visit <http://gosling-lang.org/docs/visual-channel#strokewidth>

Value

List object.

visual_channel_text *text visual channel*

Description

text visual channel

Usage

```
visual_channel_text(
  field = NULL,
  type = NULL,
  range = NULL,
  domain = NULL,
  ...
)
```

Arguments

| | |
|--------|--|
| field | A character. Name of the data field. |
| type | A character. Must be "genomic". Specify the data type. |
| range | A vector of characters or numbers. Values of the visual channel. |
| domain | A vector of characters or numbers. Values of the data. |
| ... | Any other parameters to pass to gosling.js. |

Details

For more info visit <http://gosling-lang.org/docs/visual-channel#text>

Value

List object.

Examples

```
if(interactive()) {
  library(shiny)
  library(shiny.gosling)

  # View 2 Track 3----
  view2_track3_data <- track_data(
    url = "https://server.gosling-lang.org/api/v1/tileset_info/?d=NC_045512_2-multivec",
    type = "multivec",
    row = "base",
    column = "position",
    value = "count",
    categories = c("A", "T", "G", "C"),
    start = "start",
    end = "end"
  )

  view2_track3a <- add_single_track(
```

```
mark = "bar",
y = visual_channel_y(
  field = "count", type = "quantitative", axis = "none"
)
)

view2_track3b <- add_single_track(
  dataTransform = track_data_transform(
    type = "filter",
    field = "count",
    oneOf = list(0),
    not = TRUE
  ),
  mark = "text",
  x = visual_channel_x(
    field = "start", type = "genomic"
  ),
  xe = visual_channel_x(
    field = "end", type = "genomic"
  ),
  size = 24,
  color = "white",
  visibility = list(list(
    operation = "less-than",
    measure = "width",
    threshold = "|xe-x|",
    transitionPadding = 30,
    target = "mark"
  )),
  list(
    operation = "LT",
    measure = "zoomLevel",
    threshold = 40,
    target = "track"
  ))
)

view2_track3_x <- visual_channel_x(
  field = "position", type = "genomic"
)

view2_track3_color <- visual_channel_color(
  field = "base",
  type = "nominal",
  domain = c("A", "T", "G", "C"),
  legend = TRUE
)

view2_track3_text <- visual_channel_text(
  field = "base", type = "nominal"
)

view2_track3_style <- default_track_styles(
  inlineLegend = TRUE
)

view2_track3 <- add_single_track(
```

```

    title = "NC_045512.2 Sequence",
    alignment = "overlay",
    data = view2_track3_data,
    tracks = add_multi_tracks(
      view2_track3a, view2_track3b
    ),
    x = view2_track3_x,
    color = view2_track3_color,
    text = view2_track3_text,
    style = view2_track3_style,
    width = 800, height = 40
  )

view2 <- compose_view(
  multi = TRUE,
  centerRadius = 0,
  xDomain = list(interval = c(1, 29903)),
  linkingId = "detail",
  alignment = "stack",
  tracks = add_multi_tracks(
    view2_track3
  )
)

combined_view <- arrange_views(
  title = "SARS-CoV-2",
  subtitle = "Data Source: WashU Virus Genome Browser, NCBI, GISAID",
  assembly = list(list("NC_045512.2", 29903)),
  layout = "linear",
  spacing = 50,
  views = list(view2),
  listify = FALSE
)

ui <- fluidPage(
  use_gosling(),
  fluidRow(
    column(6, goslingOutput("gosling_plot"))
  )
)

server <- function(input, output, session) {
  output$gosling_plot <- renderGosling({
    gosling(
      component_id = "sars_cov2",
      combined_view
    )
  })
}

shinyApp(ui, server)
}

```

visual_channel_tooltip
tooltip visual channel

Description

tooltip visual channel

Usage

```
visual_channel_tooltip(field = NULL, type = NULL, alt = NULL, ...)
```

Arguments

| | |
|-------|--|
| field | A character. Name of the data field. |
| type | A character. Must be "genomic". Specify the data type. |
| alt | A character. |
| ... | Any other parameters to pass to gosling.js. |

Details

For more info visit <https://gosling.js.org/> and check for tooltip implementation

Value

List object. list object with tooltip list object

Examples

```
if(interactive()) {
  library(shiny)
  library(shiny.gosling)

  cistrome_data <-
    "https://server.gosling-lang.org/api/v1/tileset_info/?d=cistrome-multivec"

  single_track <- add_single_track(
    id = "track1",
    data = track_data(
      url = cistrome_data,
      type = "multivec",
      row = "sample",
      column = "position",
      value = "peak",
      categories = c("sample 1", "sample 2", "sample 3", "sample 4"),
      binSize = 4,
    ),
    mark = "rect",
    x = visual_channel_x(field = "start", type = "genomic", axis = "top"),
    xe = visual_channel_x(field = "end", type = "genomic"),
    row = visual_channel_row(
      field = "sample",
```

```

    type = "nominal",
    legend = TRUE
  ),
  color = visual_channel_color(
    field = "peak",
    type = "quantitative",
    legend = TRUE
  ),
  tooltip = visual_channel_tooltips(
    visual_channel_tooltip(field = "start", type = "genomic",
      alt = "Start Position"),
    visual_channel_tooltip(field = "end", type = "genomic",
      alt = "End Position"),
    visual_channel_tooltip(
      field = "peak",
      type = "quantitative",
      alt = "Value",
      format = "0.2"
    )
  ),
  width = 600,
  height = 130
)

single_composed_track <- compose_view(
  tracks = single_track
)

single_composed_views <- arrange_views(
  title = "Single Track",
  subtitle = "This is the simplest single track visualization with a linear layout",
  layout = "circular", #"linear"
  views = single_composed_track,
  xDomain = list(
    chromosome = "chr1",
    interval = c(1, 3000500)
  )
)

ui <- fluidPage(
  use_gosling(),
  fluidRow(
    column(6, goslingOutput("gosling_plot")),
    column(
      1, br(), actionButton(
        "download_pdf",
        "PDF",
        icon = icon("cloud-arrow-down")
      )
    )
  )
)

server <- function(input, output, session) {
  output$gosling_plot <- renderGosling({
    gosling(

```

```

        component_id = "component_1",
        single_composed_views,
        clean_braces = TRUE
      )
    })

    observeEvent(input$download_pdf, {
      export_pdf(component_id = "component_1")
    })
  }

  shinyApp(ui, server)
}

```

visual_channel_tooltips

Combine tooltips into a list

Description

Combine tooltips into a list

Usage

```
visual_channel_tooltips(...)
```

Arguments

... Any other parameters to pass to gosling.js.

Value

List object. json list with tooltips combined into a single spec

Examples

```

if(interactive()) {
  library(shiny)
  library(shiny.gosling)

  cistrome_data <-
    "https://server.gosling-lang.org/api/v1/tileset_info/?d=cistrome-multivec"

  single_track <- add_single_track(
    id = "track1",
    data = track_data(
      url = cistrome_data,
      type = "multivec",
      row = "sample",
      column = "position",
      value = "peak",
      categories = c("sample 1", "sample 2", "sample 3", "sample 4"),

```

```

    binSize = 4,
  ),
  mark = "rect",
  x = visual_channel_x(field = "start", type = "genomic", axis = "top"),
  xe = visual_channel_x(field = "end", type = "genomic"),
  row = visual_channel_row(
    field = "sample",
    type = "nominal",
    legend = TRUE
  ),
  color = visual_channel_color(
    field = "peak",
    type = "quantitative",
    legend = TRUE
  ),
  tooltip = visual_channel_tooltips(
    visual_channel_tooltip(field = "start", type = "genomic",
                          alt = "Start Position"),
    visual_channel_tooltip(field = "end", type = "genomic",
                          alt = "End Position"),
    visual_channel_tooltip(
      field = "peak",
      type = "quantitative",
      alt = "Value",
      format = "0.2"
    )
  ),
  width = 600,
  height = 130
)

single_composed_track <- compose_view(
  tracks = single_track
)

single_composed_views <- arrange_views(
  title = "Single Track",
  subtitle = "This is the simplest single track visualization with a linear layout",
  layout = "circular", #"linear"
  views = single_composed_track,
  xDomain = list(
    chromosome = "chr1",
    interval = c(1, 3000500)
  )
)

ui <- fluidPage(
  use_gosling(),
  fluidRow(
    column(6, goslingOutput("gosling_plot")),
    column(
      1, br(), actionButton(
        "download_pdf",
        "PDF",
        icon = icon("cloud-arrow-down")
      )
    )
  )
)

```

```

    )
  )

  server <- function(input, output, session) {
    output$gosling_plot <- renderGosling({
      gosling(
        component_id = "component_1",
        single_composed_views,
        clean_braces = TRUE
      )
    })

    observeEvent(input$download_pdf, {
      export_pdf(component_id = "component_1")
    })
  }

  shinyApp(ui, server)
}

```

| | |
|------------------|-------------------------------------|
| visual_channel_x | <i>x and xe axis visual channel</i> |
|------------------|-------------------------------------|

Description

x and xe axis visual channel

Usage

```

visual_channel_x(
  field = NULL,
  type = NULL,
  legend = NULL,
  grid = NULL,
  axis = NULL,
  aggregate = NULL,
  ...
)

```

Arguments

| | |
|-----------|--|
| field | A character. Name of the data field. |
| type | A character. Must be "genomic". Specify the data type. |
| legend | A Boolean. Whether to display legend. Default: FALSE. |
| grid | A Boolean. Whether to display grid. Default: FALSE. |
| axis | A character. One of "none", "top", "bottom", "left", "right". Specify where should the axis be put. |
| aggregate | A character. One of "max", "min", "mean", "bin", "count". Specify how to aggregate data. Default: undefined. |
| ... | Any other parameters to pass to gosling.js. |

Details

For more info visit <http://gosling-lang.org/docs/visual-channel#x-xe>

Value

List object.

Examples

```
if(interactive()) {
  library(shiny)
  library(shiny.gosling)

  cistrome_data <-
    "https://server.gosling-lang.org/api/v1/tileset_info/?d=cistrome-multivec"

  single_track <- add_single_track(
    id = "track1",
    data = track_data(
      url = cistrome_data,
      type = "multivec",
      row = "sample",
      column = "position",
      value = "peak",
      categories = c("sample 1", "sample 2", "sample 3", "sample 4"),
      binSize = 4,
    ),
    mark = "rect",
    x = visual_channel_x(field = "start", type = "genomic", axis = "top"),
    xe = visual_channel_x(field = "end", type = "genomic"),
    row = visual_channel_row(
      field = "sample",
      type = "nominal",
      legend = TRUE
    ),
    color = visual_channel_color(
      field = "peak",
      type = "quantitative",
      legend = TRUE
    ),
    tooltip = visual_channel_tooltips(
      visual_channel_tooltip(field = "start", type = "genomic",
        alt = "Start Position"),
      visual_channel_tooltip(field = "end", type = "genomic",
        alt = "End Position"),
      visual_channel_tooltip(
        field = "peak",
        type = "quantitative",
        alt = "Value",
        format = "0.2"
      )
    ),
    width = 600,
    height = 130
  )
}
```

```

single_composed_track <- compose_view(
  tracks = single_track
)

single_composed_views <- arrange_views(
  title = "Single Track",
  subtitle = "This is the simplest single track visualization with a linear layout",
  layout = "circular", #"linear"
  views = single_composed_track,
  xDomain = list(
    chromosome = "chr1",
    interval = c(1, 3000500)
  )
)

ui <- fluidPage(
  use_gosling(),
  fluidRow(
    column(6, goslingOutput("gosling_plot")),
    column(
      1, br(), actionButton(
        "download_pdf",
        "PDF",
        icon = icon("cloud-arrow-down")
      )
    )
  )
)

server <- function(input, output, session) {
  output$gosling_plot <- renderGosling({
    gosling(
      component_id = "component_1",
      single_composed_views,
      clean_braces = TRUE
    )
  })

  observeEvent(input$download_pdf, {
    export_pdf(component_id = "component_1")
  })
}

shinyApp(ui, server)
}

```

visual_channel_y

y and ye axis visual channel

Description

y and ye axis visual channel

Usage

```
visual_channel_y(
  field = NULL,
  zeroBaseline = NULL,
  type = NULL,
  legend = NULL,
  grid = NULL,
  flip = NULL,
  baseline = NULL,
  axis = NULL,
  aggregate = NULL,
  ...
)
```

Arguments

| | |
|--------------|--|
| field | A character. Name of the data field. |
| zeroBaseline | A Boolean. Specify whether to use zero baseline. Default: TRUE. |
| type | A character. Must be "genomic". Specify the data type. |
| legend | A Boolean. Whether to display legend. Default: FALSE. |
| grid | A Boolean. Whether to display grid. Default: FALSE. |
| flip | A Boolean. Whether to flip the y-axis. This is done by inverting the range property. Default: FALSE. |
| baseline | A character or number. Custom baseline of the y-axis. Default: 0. |
| axis | A character. One of "none", "top", "bottom", "left", "right". Specify where should the axis be put. |
| aggregate | A character. One of "max", "min", "mean", "bin", "count". Specify how to aggregate data. Default: undefined. |
| ... | Any other parameters to pass to gosling.js. |

Details

For more info visit <http://gosling-lang.org/docs/visual-channel#y-ye>

Value

List object.

Examples

```
if(interactive()) {
  library(shiny)
  library(shiny.gosling)

  # Circular track 1 ----
  circular_track1_data <- track_data(
    url = "https://server.gosling-lang.org/api/v1/tileset_info/?d=cistrome-multivec",
    type = "multivec",
    row = "sample",
    column = "position",
    value = "peak",
```



```

    categories = c("sample 1", "sample 2", "sample 3", "sample 4"),
    binSize = 4
  )

  circular_track1_x <- visual_channel_x(field = "start", type = "genomic")
  circular_track1_xe <- visual_channel_x(field = "end", type = "genomic")

  circular_track1_y <- visual_channel_y(field = "peak", type = "quantitative")

  circular_track1_row <- visual_channel_row(
    field = "sample", type = "nominal"
  )

  circular_track1_color <- visual_channel_color(
    field = "sample", type = "nominal"
  )

  circular_track1_tracks <- add_multi_tracks(
    add_single_track(
      mark = "bar"
    ),
    add_single_track(
      mark = "brush",
      x = visual_channel_x(linkingId = "detail-1"),
      color = "blue"
    ),
    add_single_track(
      mark = "brush",
      x = visual_channel_x(linkingId = "detail-2"),
      color = "red"
    )
  )

  circular_track1_styles <- default_track_styles(
    outlineWidth = 0
  )

  circular_track1 <- add_single_track(
    id = "circular_track1", alignment = "overlay", data = circular_track1_data,
    x = circular_track1_x, xe = circular_track1_xe,
    y = circular_track1_y, row = circular_track1_row,
    color = circular_track1_color,
    stroke = "black", strokeWidth = 0.3,
    tracks = circular_track1_tracks,
    style = circular_track1_styles,
    width = 500, height = 100
  )

  # Compose Circular track ----
  circular_composed_view <- compose_view(
    multi = TRUE,
    tracks = add_multi_tracks(
      circular_track1
    ),
    static = TRUE, layout = "circular", alignment = "stack"
  )

```

```
# Arrange final view
circular_linear_view <- arrange_views(
  arrangement = "horizontal",
  views = list(circular_composed_view)
)

ui <- fluidPage(
  use_gosling(),
  fluidRow(
    column(6, goslingOutput("gosling_plot"))
  )
)

server <- function(input, output, session) {
  output$gosling_plot <- renderGosling({
    gosling(
      component_id = "circular_component",
      circular_linear_view, clean_braces = FALSE
    )
  })
}

shinyApp(ui, server)
}
```

zoom_to

Zoom to

Description

Zooms to a specific genomic position with the animated transition.

Usage

```
zoom_to(
  component_id,
  view_id,
  position,
  padding = 0,
  duration = 1000,
  session = getDefaultReactiveDomain()
)
```

Arguments

component_id A character. The id of the component_id prop passed to the GoslingComponent function.

| | |
|----------|--|
| view_id | A character. The ID of a view that you want to control. This ID is consistent to what you specify as track.id in your spec. |
| position | A character. The genomic position that your view should be navigated to. You can either specify chromosome (e.g., chr1) or a chromosome and range pair (e.g., chr1:1-10000). |
| padding | A numeric. This determines the padding around the specified position. The unit of this number is a base pair (Default: 0). |
| duration | A numeric. A duration of the animated transition in ms (Default: 1000). |
| session | A shiny session object. |

Value

None.

Examples

```
if(interactive()) {
  library(shiny)
  library(shiny.gosling)

  chromosome_options <- c(
    "Chr 1" = "chr1",
    "Chr 2" = "chr2",
    "Chr X" = "chrX",
    "Chr Y" = "chrY"
  )

  cistrome_data <-
    "https://server.gosling-lang.org/api/v1/tileset_info/?d=cistrome-multivec"

  single_track <- add_single_track(
    id = "track1",
    data = track_data(
      url = cistrome_data,
      type = "multivec",
      row = "sample",
      column = "position",
      value = "peak",
      categories = c("sample 1", "sample 2", "sample 3", "sample 4"),
      binSize = 4,
    ),
    mark = "rect",
    x = visual_channel_x(field = "start", type = "genomic", axis = "top"),
    xe = visual_channel_x(field = "end", type = "genomic"),
    row = visual_channel_row(
      field = "sample",
      type = "nominal",
      legend = TRUE
    ),
    color = visual_channel_color(
      field = "peak",
      type = "quantitative",
      legend = TRUE
    ),
    tooltip = visual_channel_tooltips(
```

```

visual_channel_tooltip(field = "start", type = "genomic",
                       alt = "Start Position"),
visual_channel_tooltip(field = "end", type = "genomic",
                       alt = "End Position"),
visual_channel_tooltip(
  field = "peak",
  type = "quantitative",
  alt = "Value",
  format = "0.2"
)
),
width = 600,
height = 130
)

single_composed_track <- compose_view(
  tracks = single_track
)

single_composed_views <- arrange_views(
  title = "Single Track",
  subtitle = "This is the simplest single track visualization with a linear layout",
  layout = "circular", #"linear"
  views = single_composed_track,
  xDomain = list(
    chromosome = "chr1",
    interval = c(1, 3000500)
  )
)

ui <- fluidPage(
  use_gosling(),
  fluidRow(
    column(6, goslingOutput("gosling_plot")),
    column(
      1, br(), actionButton(
        "zoom_out",
        "Zoom To"
      )
    ),
  ),
  column(
    2,
    selectInput(
      "chromosomes",
      "Chromosome",
      selected = "chr1",
      choices = chromosome_options
    )
  )
)

server <- function(input, output, session) {
  output$gosling_plot <- renderGosling({
    gosling(
      component_id = "component_1",

```

```

        single_composed_views,
        clean_braces = TRUE
      )
    })

    observeEvent(input$zoom_out, {
      zoom_to(
        component_id = "component_1",
        view_id = "track1",
        position = input$chromosomes
      )
    })
  }

  shinyApp(ui, server)
}

```

 zoom_to_extent

Zoom to extent

Description

Zooms out to see the entire view_id passed to this function.

Usage

```

zoom_to_extent(
  component_id,
  view_id,
  duration = 1000,
  session = getDefaultReactiveDomain()
)

```

Arguments

| | |
|--------------|---|
| component_id | A character. The id of the component_id prop passed to the GoslingComponent function. |
| view_id | A character. The ID of a view that you want to control. This ID is consistent to what you specify as track.id in your spec. |
| duration | A numeric. A duration of the animated transition in ms (Default: 1000). |
| session | A shiny session object. |

Value

None.

Examples

```

if(interactive()) {
  library(shiny)
  library(shiny.gosling)

  cistrome_data <-
    "https://server.gosling-lang.org/api/v1/tileset_info/?d=cistrome-multivec"

  single_track <- add_single_track(
    id = "track1",
    data = track_data(
      url = cistrome_data,
      type = "multivec",
      row = "sample",
      column = "position",
      value = "peak",
      categories = c("sample 1", "sample 2", "sample 3", "sample 4"),
      binSize = 4,
    ),
    mark = "rect",
    x = visual_channel_x(field = "start", type = "genomic", axis = "top"),
    xe = visual_channel_x(field = "end", type = "genomic"),
    row = visual_channel_row(
      field = "sample",
      type = "nominal",
      legend = TRUE
    ),
    color = visual_channel_color(
      field = "peak",
      type = "quantitative",
      legend = TRUE
    ),
    tooltip = visual_channel_tooltips(
      visual_channel_tooltip(field = "start", type = "genomic",
                            alt = "Start Position"),
      visual_channel_tooltip(field = "end", type = "genomic",
                            alt = "End Position"),
      visual_channel_tooltip(
        field = "peak",
        type = "quantitative",
        alt = "Value",
        format = "0.2"
      )
    ),
    width = 600,
    height = 130
  )

  single_composed_track <- compose_view(
    tracks = single_track
  )

  single_composed_views <- arrange_views(
    title = "Single Track",
    subtitle = "This is the simplest single track visualization with a linear layout",
    layout = "circular", #"linear"
  )

```

```
views = single_composed_track,
xDomain = list(
  chromosome = "chr1",
  interval = c(1, 3000500)
)
)

ui <- fluidPage(
  use_gosling(),
  fluidRow(
    column(6, goslingOutput("gosling_plot")),
    column(
      1, br(), actionButton(
        "zoom_out",
        "Zoom Out"
      )
    )
  )
)

server <- function(input, output, session) {
  output$gosling_plot <- renderGosling({
    gosling(
      component_id = "component_1",
      single_composed_views,
      clean_braces = TRUE
    )
  })

  observeEvent(input$zoom_out, {
    zoom_to_extent(
      component_id = "component_1",
      view_id = "track1"
    )
  })
}

shinyApp(ui, server)
}
```

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