Package 'shiny.gosling'

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Title A Grammar-based Toolkit for Scalable and Interactive Genomics Data Visualization for R and Shiny

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Language en-US

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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Contents

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

file_path	A character. Specify the file_path to the local csv file.
object	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 visual_channel_x().
xe	An object returned by visual_channel_x().
x1	An object returned by visual_channel_x().
x1e	An object returned by visual_channel_x().
y	An object returned by visual_channel_y().
strokeWidth	A number or an object returned by visual_channel_stroke_width().
opacity	A number or an object returned by visual_channel_opacity().
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 visual_channel_size().
color	A character or an object returned by visual_channel_color().
stroke	A number or an object returned by visual_channel_stroke().

Details

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

Value

list of mark specifications

---

add_multi_tracks *Combine single tracks.*

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: • 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 visual_channel_y() OR an atomic value.
stroke	An object of from visual_channel_stroke() 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 track_data_transform() function.
...	Any other arguments to be passed onto gosling.js.

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)

}
```

`arrange_views` *Arrange views*

Description

Arrange views from compose_view() function.

Usage

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

Arguments

`layout`	One of "linear" or "circular".
`views`	An object from compose_view() function.
`listify`	A Boolean. Convert views to list..
`...`	More options passed 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(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)

}
```

`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` *style of the brush mark*

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 *Build gosling spec from R list*

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 *Create react component*

Description

Create react component

Usage

```
component(name)
```

Arguments

name	name of the react component

Value

function to create react element

compose_view *Compose views*

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(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)

}
```

`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` *Build gosling plot object*

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` *Create Gosling component*

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` *is_atomic_field*

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` *Create list*

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` *Print method for the gosling component*

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` *gosling render function*

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(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)
}
```

---

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(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)
}
```

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(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_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 *row visual channel*

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)

}
```

`visual_channel_size` *size visual channel*

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` *x and xe axis visual channel*

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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