

Package ‘amapro’

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Type Package

Title Thin Wrapper for Mapping Library 'AMap' by 'AutoNavi'

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Description Build and control interactive 2D and 3D maps with 'R/Shiny'. Lean set of powerful commands wrapping native calls to 'AMap' <<https://lbs.amap.com/api/jsapi-v2/summary/>>. Deliver rich mapping functionality with minimal overhead.

URL <https://github.com/helgasoft/amapro/>

BugReports <https://github.com/helgasoft/amapro/issues/>

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-- Introduction -- *Introduction*

Description

Essential information, tips and tricks

Details

We welcome AMap JavaScript library into the world of R. AMap is an advanced mapping library made in China and widely used there. It features 2D/3D animation, supports a multitude of layers and markers, data import, flyover playback, etc. Library *amapro* let you control AMap from R and Shiny. It uses AMap's native commands and parameters wrapped in a few commands of its own.

Translation

AMap's documentation is in Chinese and most links here make reference to it. If you happen *not* to know Chinese, it is convenient to set your browser to [auto-translate](#). This will help a little or a lot depending on the website/page structure. One can also copy/paste text to [Google translate](#).

Installation

Install **amapro** from Github with `remotes::install_github("helgasoft/amapro")` Then run the following R commands `library(amapro); am.init()` A pop-up dialog will ask for an API key (shows once, will not be repeated). API key is obtained through [registration](#), expecting you to provide a Chinese phone number for the SMS verification code. How to get an API key if you reside out of China?

- ask a friend from China to help, or hire a local [freelancer](#)
- search the web for a shared key
- use a temporary Chinese phone number from sites like [sms24](#), [turtle-sms](#), etc. However most are probably blacklisted as the registration page shows them as *already registered*.
- select temporarily the 'demo' option, without guarantee to work in the long run

Shiny Demo

Interactive, hands-on showcase of many library features. Activate with the following command:
`library(amapro); demo(am.shiny)`

API links

amapro is based on version 2.0 of AMap (JSAPI v2.0). “API” auto-translates as “Reference book” in web menus.

AMap:

The base library with optional plugins. Most important links are

- [Summary](#)
- [Guide](#)
- [API1](#) official documentation
- [API2](#) same as 1, but better auto-translation
- [Examples](#) - live demos
- [Forum](#) - reported issues

LOCA:

AMap extension with enhanced 3D features. In *amapro* it is invoked with a parameter `am.init(loca=TRUE, ...)`. The documentation auto-translates well in Chrome.

- [Intro](#)
- [API](#) documentation

Commands

Controlling map and items is done by sending AMap commands to them. Example: `am.cmd('setAngle', 'carIcon', -90)` *amapro* uses native AMap commands and introduces these additional:

- **set** - create new item
 - with *name*: add new global JS object (*window*.) outside the map `am.cmd('set', 'VectorLayer', name='e$layer1')`
 - without *name*: add new item to map `am.cmd('set', 'e$marker1', position=c(116.478, 39.998))`
- **addTo** - append one existing JS object to another by name `am.cmd('addTo', 'e$layer1', 'e$marker1')`
- **var** - set a JavaScript variable `am.cmd('var', 'e$myOpacity', 0.8)`
- **code** - execute JavaScript code `am.cmd('code', 'alert("I am JS");')`

AMap commands starting with **get** return data from the map or related objects. Put the data in a Shiny input variable by setting its name in parameter **r**. Example: `am.cmd('getCenter', 'map', r='inShiny1')` Above command will update `input$inShiny1` with the Lng/Lat coordinates of the map center.

Events

Events could be defined for map and items. All types of instances use **on/off methods** to bind and remove events. Events are set in attribute **on**(or **off**) as a list of lists. Each event is a separate list with event name in **e**, a JS function **f** and optionally a query **q**. Example:

```
am.init(center= c(116.475, 39.997), zoom= 17,
        on= list(list(e= 'complete',
                      f= "function() {alert('loaded!');}")) )
```

on/off events without *name* are ignored, except for the map itself (as above example). Function *Shiny.setInputValue()* can be used in JavaScript to send data back to Shiny.

Limitations

- only one map is created by *am.init* per session. It is a JS global called ‘m\$map’.
- AMap command *addTo* is overwritten by *amapro* and cannot be used.
- AMap plugins supported are ControlBar, Scale, ToolBar, MoveAnimation, MouseTool, HeatMap, GeoJSON, ElasticMarker.
- Loca supported items are GeoJSONSource, PolygonLayer, ScatterLayer, LinkLayer, PulseLinkLayer. Loca events are not supported yet.
- most **built-in** AMap tile layers (Satellite, Traffic, Roads) are limited to China only. However, with command *am.item('TileLayer')*, one can use any **Leaflet provider** for worldwide coverage.
- AMap built-in **map layers** are **G CJ-02 coded** and coordinates collected on them will display incorrectly in Leaflet or other WGS-84 based maps, and vice-versa. They need to be **converted**. Conversion is available through function **convertFrom**.
- AMap ecosystem is vast, some unsupported features include: ‘BesizerCurve’, ‘MarkerCluster’, ‘HawkEye’, **IndoorMap**, **CustomLayer**, ‘GLCustomLayer’, ‘DistrictLayer’, ‘LayerGroup’, all editors like ‘PolygonEditor’, ‘Webservice’, ‘Search(AMap.Autocomplete, AMap.PlaceSearch)’, ‘Geocoding(AMap.Geocoder)’, Route planning, other services(weather, districts, etc.), positioning, utilities.

Tips

- all named objects created in JS are **global variables** (*window.name*). Good practice is to use a name prefix (m\$) to avoid overwriting accidentally external variables.
- API attributes could be set to a JS function instead of a value. Function is defined as a string starting with word “function”.
- usually WMS/WMTS tiles come from external servers and may present a CORS problem - browser refusal to load. One can install a small **extension in Chrome** or **Firefox** to fix this problem manually inside the browser.
- AMap has several predefined **Map styles**. Could be set in map options with *mapStyle*.
- *amapro* silent errors are collected in the browser Console. Press key **F12** to open the dev.environment, then open tab “Console” to view them.
- Chrome/Firefox extensions may interfere with map presentation (like ‘uBlock’)

`am.cmd`*Run a command*

Description

Execute a command on a target element

Usage

```
am.cmd(id, cmd = NULL, target = NULL, ...)
```

Arguments

<code>id</code>	A map widget from am.init or a proxy from am.proxy
<code>cmd</code>	A command name string, like 'setFitView'
<code>target</code>	A target's name string, or 'map' for the map itself.
<code>...</code>	command attributes

Details

am.cmd provides interaction with the map.

Commands are sent to the map itself, or to objects inside or outside it.

AMap built-in objects have predefined set of commands listed in the API. Commands can modify an object (setZoom), but also get data from it (getCenter).

amapro introduces its own commands like *set*, *addTo* or *code*, described in the [Introduction](#).

Value

A map or a map proxy

See Also

[am.init](#) code example and [Introduction](#)

Examples

```
if (interactive()) {  
  am.init() |>  
  am.cmd('set', 'InfoWindow', position=c(116.6, 40), content='Beijing')  
}
```

`am.control`*Add Control*

Description

Add a Control to a map.

Usage

```
am.control(id, ctype = NULL, ...)
```

Arguments

<code>id</code>	amapro id or widget from am.init
<code>ctype</code>	A string for name of control, like 'Scale', 'ControlBar', 'ToolBar'.
<code>...</code>	A named list of parameters for the chosen control

Details

controls are ControlBar, ToolBar and Scale.
Parameters could be position or offset.

Value

A map widget to plot, or to save and expand with more features.

See Also

[am.init](#) code example

Examples

```
if (interactive()) {  
  am.init() |> am.control("Scale")  
}
```

am.init

Map Initialization

Description

First command to build a map

Usage

```
am.init(..., width = NULL, height = NULL)
```

Arguments

... attributes of map, see [here](#).
 Additional attribute *loca*(boolean) is to add a *Loca.Container* to the map.

width, height A valid CSS unit (like '100%')

Details

Command *am.init* creates a widget with [createWidget](#), then adds features to it.
 On first use, *am.init* prompts for AMap API key. There is a temporary *demo* mode when key is unavailable.

Value

A widget to plot, or to store and expand with more features

Examples

```
if (interactive()) {
  ctr <- c(22.430151, 37.073011)
  tu <- paste0('http://server.arcgisonline.com/ArcGIS/rest/services/World_Imagery/',
              'MapServer/tile/[z]/[y]/[x]')
  am.init( center= ctr, zoom= 10, pitch= 60, viewMode= '3D') |>
  am.control(ctype= 'ControlBar', position= 'RT') |>
  am.item('TileLayer', tileUrl= tu) |>
  am.item('Marker', position= ctr,
         icon= 'https://upload.wikimedia.org/wikipedia/commons/9/9d/Ancient_Greek_helmet.png'
  ) |>
  am.cmd('set', 'InfoWindow', name='iwin', content='This is Sparta') |>
  am.cmd('open', 'iwin', 'm$jmap', ctr) # m$jmap is the map name in JavaScript
}
```

am.item

Add Item

Description

Add an item to a map

Usage

```
am.item(id, itype, ...)
```

Arguments

id	A valid widget from am.init
itype	A string for item type name, like 'Marker'
...	attributes of item

Details

To add an item like Marker, Text or Polyline to the map

Value

A map widget to plot, or to save and expand with more features

See Also

[am.init](#) code example

Examples

```
if (interactive()) {  
  am.init() |> am.item('Marker', position=c(116.6, 40))  
}
```

am.output*Shiny: map UI*

Description

Placeholder for a map in Shiny UI

Usage

```
am.output(outputId, width = "100%", height = "400px")
```


Arguments

outputId	Name of output UI element.
width, height	Must be a valid CSS unit (like '100%', '400px', 'auto') or a number, which will be coerced to a string and have 'px' appended.

Value

An output or render function that enables the use of the widget within Shiny applications. See [shinyWidgetOutput](#).

See Also

Shiny demo in `demo(am.shiny)`

`am.proxy`*Shiny: create a map proxy*

Description

Create a proxy for an existing map in Shiny. It allows to add, merge, delete elements to a map without reloading it.

Usage

```
am.proxy(id)
```

Arguments

id	Target map id from the Shiny UI
----	---------------------------------

Value

A proxy object to update the map

Examples

```
if (interactive()) {  
  demo(am.shiny)  
}
```

`am.render`*Shiny: render a map*

Description

This is the initial rendering of a map in the UI.

Usage

```
am.render(wt, env = parent.frame())
```

Arguments

<code>wt</code>	An amapro widget to generate the chart.
<code>env</code>	The environment in which to evaluate expr.

Value

An output or render function that enables the use of the widget within Shiny applications.

See Also

[am.proxy](#) for example, [shinyRenderWidget](#) for return value.

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