



Rbanism

**Building digital competence for reproducible, automated and scalable
research in the urbanism research community**

The Rbanism Core Team

Daniele Cannatella, Clémentine Cottineau-Mugadza & Claudiu Forgaci

1. Our Mission
2. Our Activities
3. The Geospatial Data Carpentry in Urbanism
4. The Community

Rbanism ...



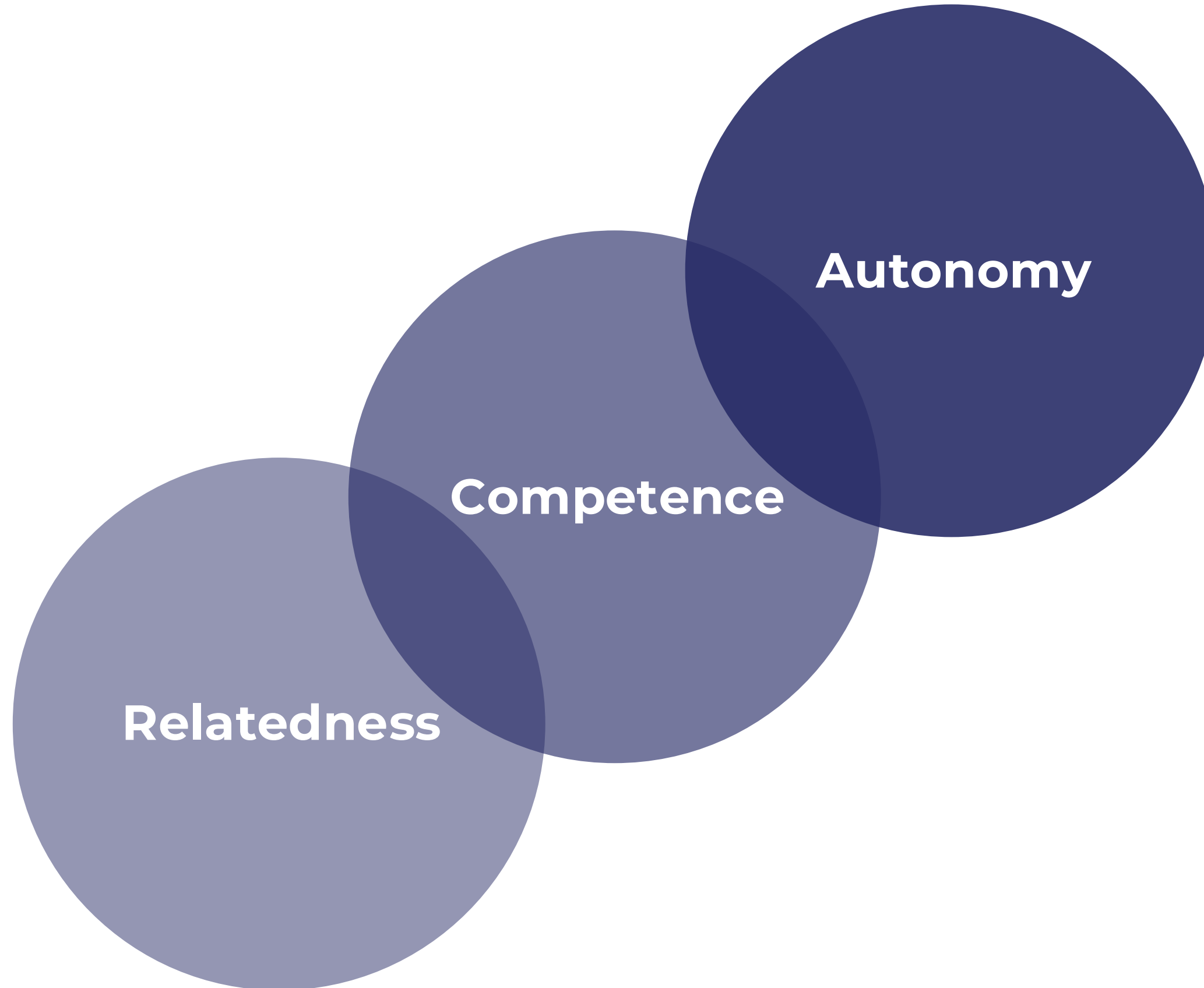
... in brief

1. Improving awariness

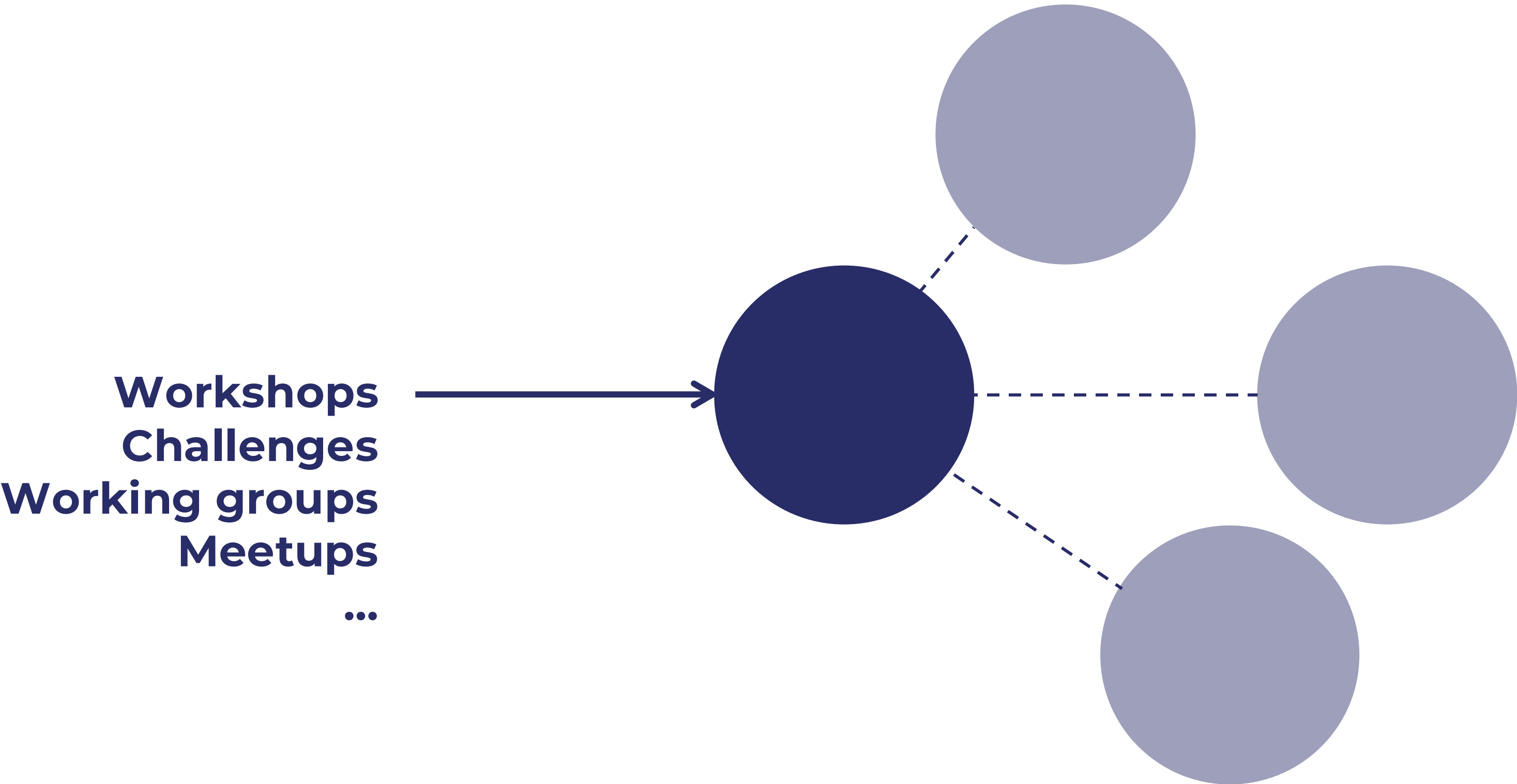
Scalability



2. Stimulating engagement



3. Building capacity



Rbanism ...



... activities

Thematic workshops



Scalable GIS workshop

Thematic workshops

2026 Workshop: Updating urban segregation computation with R

Summary

In November 2026,  is hosting a workshop gathering members of the  project, members



of  and external experts, to **identify and prioritise the methodological and technical**

developments needed to address big theoretical questions in the field of urban segregation (with R).

During 5 days, we want to foster **research discussions** spanning the diversity of theories and approaches to urban segregation (in terms of location, scale and social attributes considered, as well as type of data used), create a **community** of urban scholars who can collaborate on frontier research projects, comparative analysis, theory and methodology development, but also prepare the development of an **R package** dedicated to assist with the selection of appropriate measures of urban segregation (a “routemap”), their computation, visualization and analysis necessary to tackle state-of-the-art research questions in the field of urban segregation.

If you would like to be part of this event, please fill in the registration form **before 30th June 2026**. Admission results will be communicated mid-July 2026. We expect to invite between 10 and 20 participants to this workshop.

erc-segue.nl/Workshop

Thematic challenges

Rbanism / scalegis-challenge

<> Code

Issues

Pull requests

Actions

Projects

Wiki

Security

Insights

Settings

scalegis-challenge

Public

main

1 branch

0 tags

cforgaci

Merge pull request #1 from Rbanism/bvreede-edits

.github/ISSUE_TEMPLATE

add mermaid example

.gitignore

Add RStudio project files

README.md

typos

scalegis-challenge.Rproj

Add RStudio project files

scalegis-challenge.Rproj

README.md

The Scalable GIS Challenge for Researchers of the Urban Environment

We invite individuals or teams to submit the workflows of their own scalable GIS research in the urban environment, together with a narrative self-assessment of the level of scalability and challenges involved.

1. Introduction

Conducting research with large geospatial datasets and large-scale analyses that can be challenging. On the other hand, the increasing availability of big geodata and high performance computing infrastructure presents a great opportunity for scaling up urbanism research, either to more detailed and diverse datasets, or to large-scale analyses on national, continental or even global scale. Recognising this opportunity, the Scalable GIS Challenge for Researchers of the Urban Environment is meant both as a learning experience and as an encouragement for urbanism researchers to make their ongoing GIS work scalable.

Releases

No releases published

Create a new release

Packages

No packages published

Publish your first package

Contributors 2

cforgaci

Claudiu Forgaci

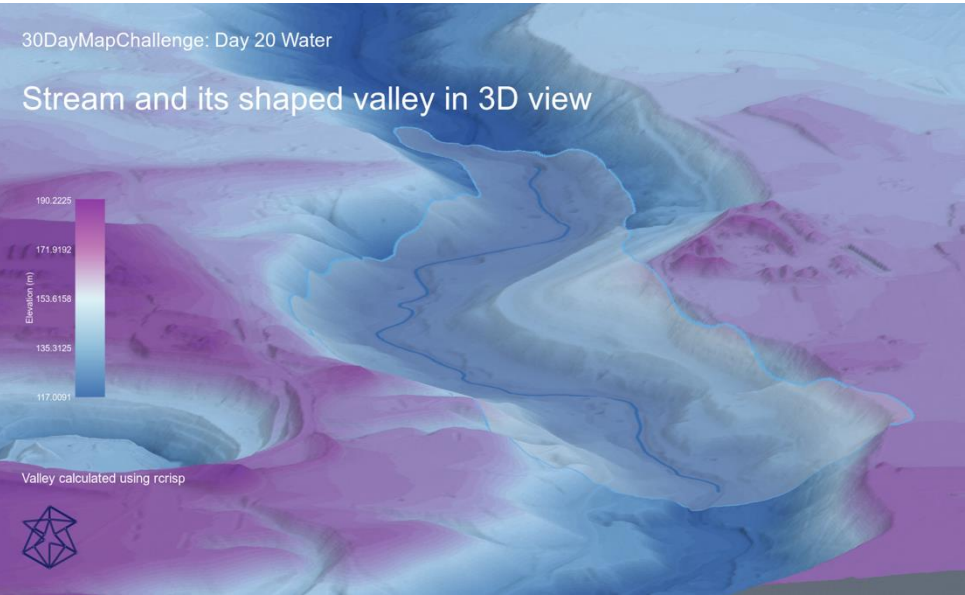
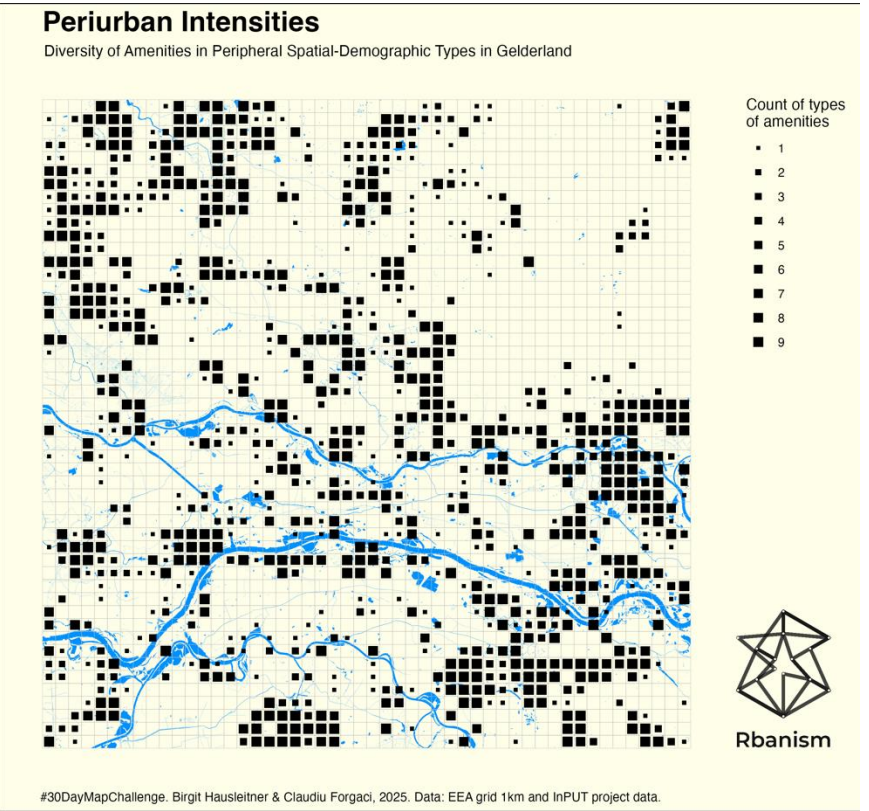
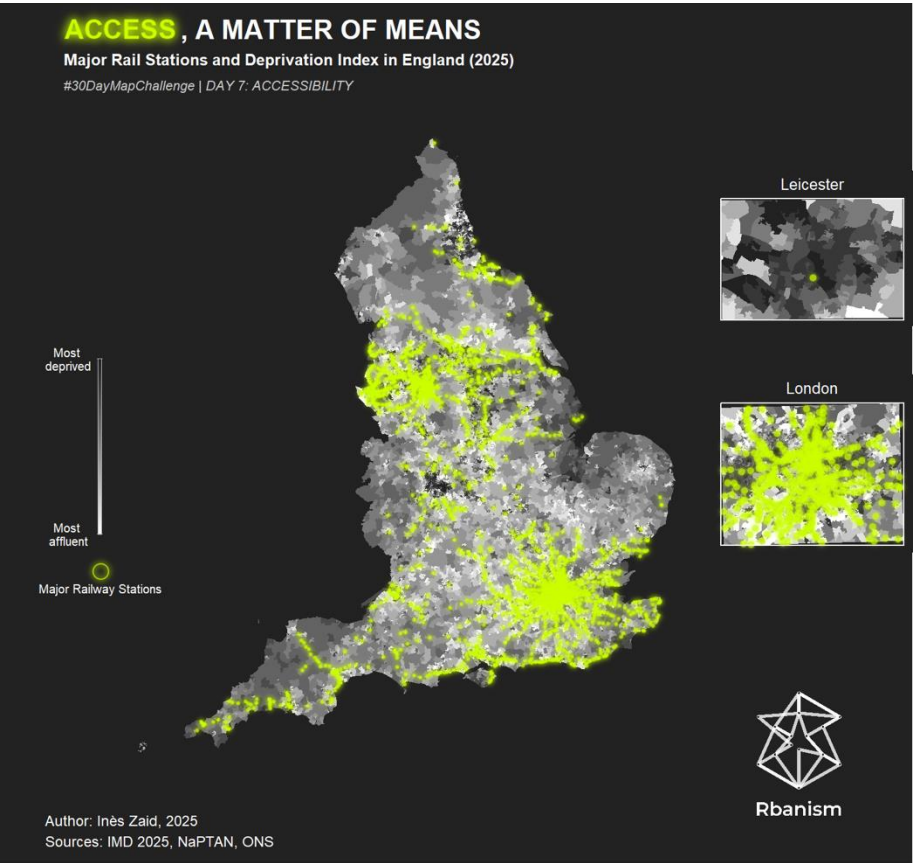
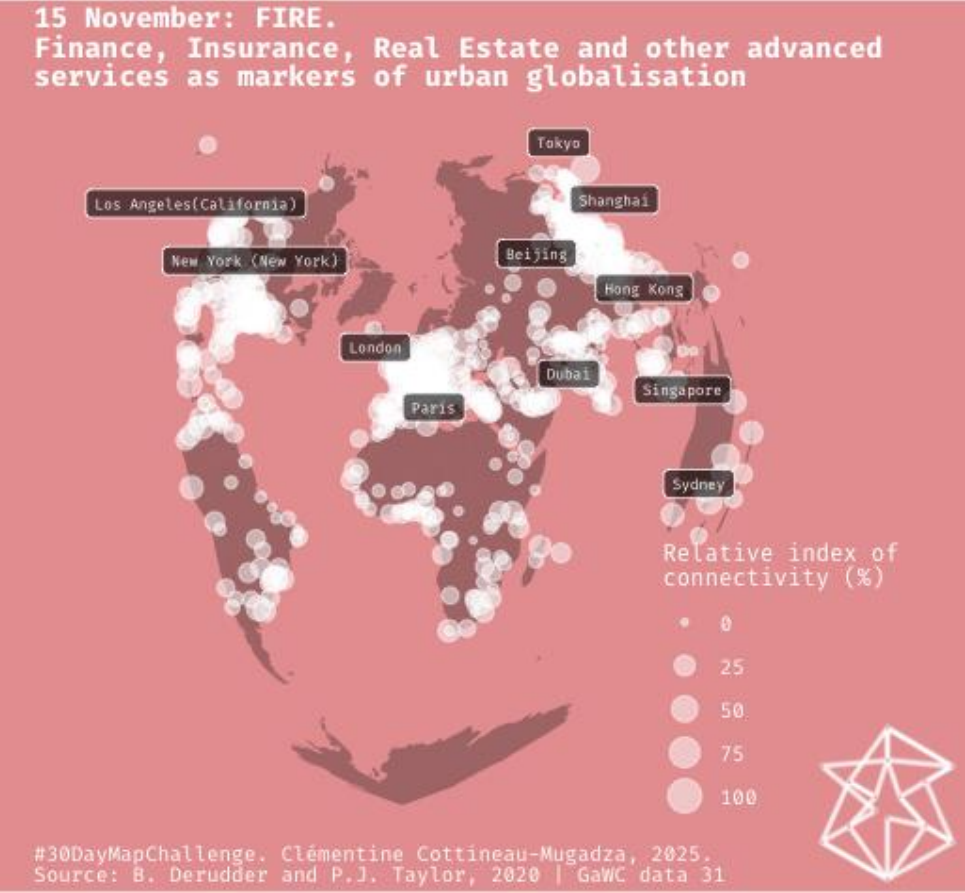
bvreede

Barbara Vreede

Can you scale up your GIS workflow?

Rbanism

#30DayMapChallenge





Training: Geospatial Data Carpentry with R for Urbanists



Rbanism ...



... training:
The GDCU

Data Carpentry for Geospatial Data with R

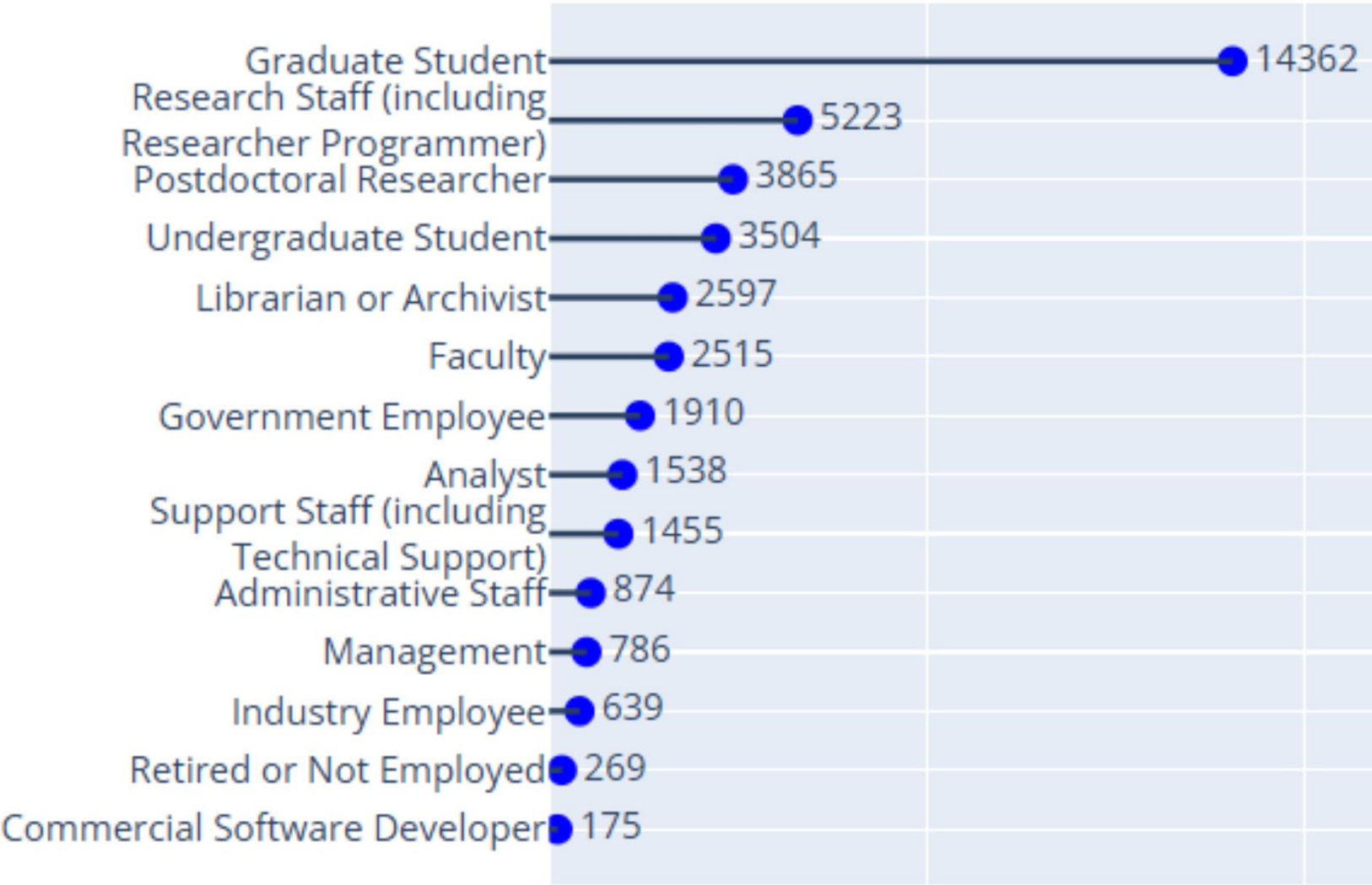
Ana Petrović, Claudiu Forgas, Clémentine Cottineau,
Daniele Cannatella, Ignacio Urria Ybarra, Javier San Millán,
Tejinder Singh, Soroush Samanfar, Yaying Hao, Yehan Wu

Data Carpentry for Geospatial Data with R

Ana Petrović, Claudiu Forgas, Clémentine Cottineau,
Daniele Cannatella, Ignacio Urria Ybarra, Javier San Millán,
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The Carpentries



The Carpentries has built a community of

5509
INSTRUCTORS

185
TRAINERS

5017
WORKSHOPS

72
COUNTRIES



Geospatial Data Carpentry for Urbanism

Key PointsGlossaryLearner ProfilesMore ▾

EPISODES

- Summary and Setup
 - 1. Introduction to R and RStudio
 - 2. Data Structures
 - 3. Exploring Data Frames & Data frame Manipulation with dplyr
 - 4. Introduction to visualisation
 - 5. Introduction to Geospatial Concepts
 - 6. Open and Plot Vector Layers
 - 7. Explore and plot by vector layer attributes
 - 8. Plot multiple shapefiles
 - 9. Handling Spatial Projections & CRS
 - 10. Intro to Raster Data
 - 11. Plot Raster Data
 - 12. Reproject Raster Data
 - 13. Raster Calculations
 - 14. Work with Multi-Band Rasters
 - 15. Import and Visualise OSM Data
 - 16. Basic GIS operations with R and sf

See all in one page

Next: Introduction to R... →

Summary and Setup

This workshop is an introduction to working with raster and vector data in R for researchers in urbanism or related fields. After a brief introduction to R (Lesson 1, Episodes 1-4), it focuses on vector (Lesson 2, Episodes 5-9) and raster data (Lesson 3, Episodes 10-14) and concludes with practical GIS operations using OpenStreetMap data (Lesson 4, Episodes 15-16). The workshop is designed to be taught in two full days.

Lesson 1 was developed using elements from our experience in teaching [R for Social Scientists](#) and from:

- Stachelek, J., Njambi, S., Mahoney, M., sheila, Thomaz, A. T., Rasel, A. A., Pérez-Suárez, D., Koontz, E., Molloy, J., Jablonski, J., Fung, J., Leinweber, K., Sisk, M., Detomasi, R., Stevens, S. L., Stewart, S., Chen, S., & Ng, W. (2023). *datacarpentry/r-intro-geospatial: Introduction to R for Geospatial Data 2023-05 (2023.05)* [Computer software]. Zenodo. <https://doi.org/10.5281/zenodo.7897052>

Episode 10 of Lesson 2 was mostly self-developed, also using elements from:

- Stachelek, J., & Marwaha, K. (2023). *datacarpentry/organization-geospatial: Data Carpentry: Introduction to Geospatial Concepts 2023-05 (2023.05)* [Computer software]. Zenodo. <https://doi.org/10.5281/zenodo.7897047>

Lessons 2 and 3 introduce an urban dataset and build on parts of:

- Stachelek, J., Becker, E. A., Asberry, D., Strimas-Mackey, M., Rasel, A. A., Li, A., Avery, R., kcarini, Marwaha, K., mneilson-usgs, Sparks, A. H., bart1, Knudsen, C. B., Kerchner, D., Vanichkina, D. P., Pérez-Suárez, Jablonski, J., Liou, M., Morandeira, N., & Williams, R. (2023). *datacarpentry/r-raster-vector-geospatial: Data Carpentry: Introduction to Geospatial Raster and Vector Data with R, February 2023 (v2023.02.06)* [Computer software]. Zenodo. <https://doi.org/10.5281/zenodo.7612769>

Lesson 4 was fully self-developed.

Overview

This workshop is designed to be run on your local machine. For this, you need to (i) download the geospatial data we use in the workshop and (ii) set up your machine with the software required to analyse and process the data. We provide installation instructions below for these steps. Please read carefully before installing anything!



edu.nl/e8mtx



Geospatial Data Carpentry for Urbanism

Schedule

Day 1

Morning	Introduction to R and Rstudio
	Data Structures
	Exploring Data Frames
	Introduction to Visualization
Afternoon	Open and Plot Shapefiles
	Explore and Plot by Vector Layer Attributes
	Plot Multiple Shapefiles
	Handling Spatial Projection & CRS
Evening	END

Day 2

Morning	Intro to Raster Data
	Plot Raster Data
	Reproject Raster Data
	Raster Calculations
	Work With Multi-Band Rasters
Afternoon	Import and Visualise OSM data
	Basic GIS operations with the `sf` package
Evening	Post-workshop survey
	Drinks & Snacks

9. Handling Spatial Projections & CRS

10. Intro to Raster Data

11. Plot Raster Data

12. Reproject Raster Data

13. Raster Calculations

14. Work with Multi-Band Rasters

15. Import and Visualise OSM Data

16. Basic GIS operations with R and sf

See all in one page

<https://doi.org/10.5281/zenodo.7897047>

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edu.nl/e8mtx

links.mdInitial commit3 years ago

r-geospatial-urban.RprojRename Rproj file3 years ago

renv.lockRemove "emo" from renv.locklast year

READMECode of conductContributingLicense

Geospatial Data Carpentry for Urbanism

Lesson Description

This workshop is an introduction to working with raster and vector data in R for researchers in urbanism or related fields. After a brief introduction to R (Lesson 1, Episodes 1-4), it focuses on vector (Lesson 2, Episodes 5-9) and raster data (Lesson 3, Episodes 10-14) and concludes with practical GIS operations using OpenStreetMap data (Lesson 4, Episodes 15-16). The workshop is designed to be taught in two full days.

Rendered Version of This Lesson

Version 1.0

Contact Information

[Rbanism Community](#)

Contributing Information

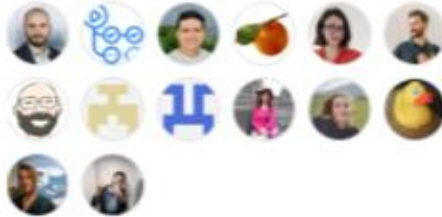
Please see the [CONTRIBUTING page](#) for guidance on how to contribute to this lesson.

Credits / Acknowledgements

Deployments216

github-pages4 months ago

Contributors14



Languages

R99.6%

TeX0.4%

Generated from [carpentries/workbench-template-rmd](#)



Introduction

Lesson 1: Intro to R

Lesson 2: Vector Data

Lesson 2: Vector Data Part 2

Lesson 3: Raster Data

Lesson 3: Raster Data Part 2

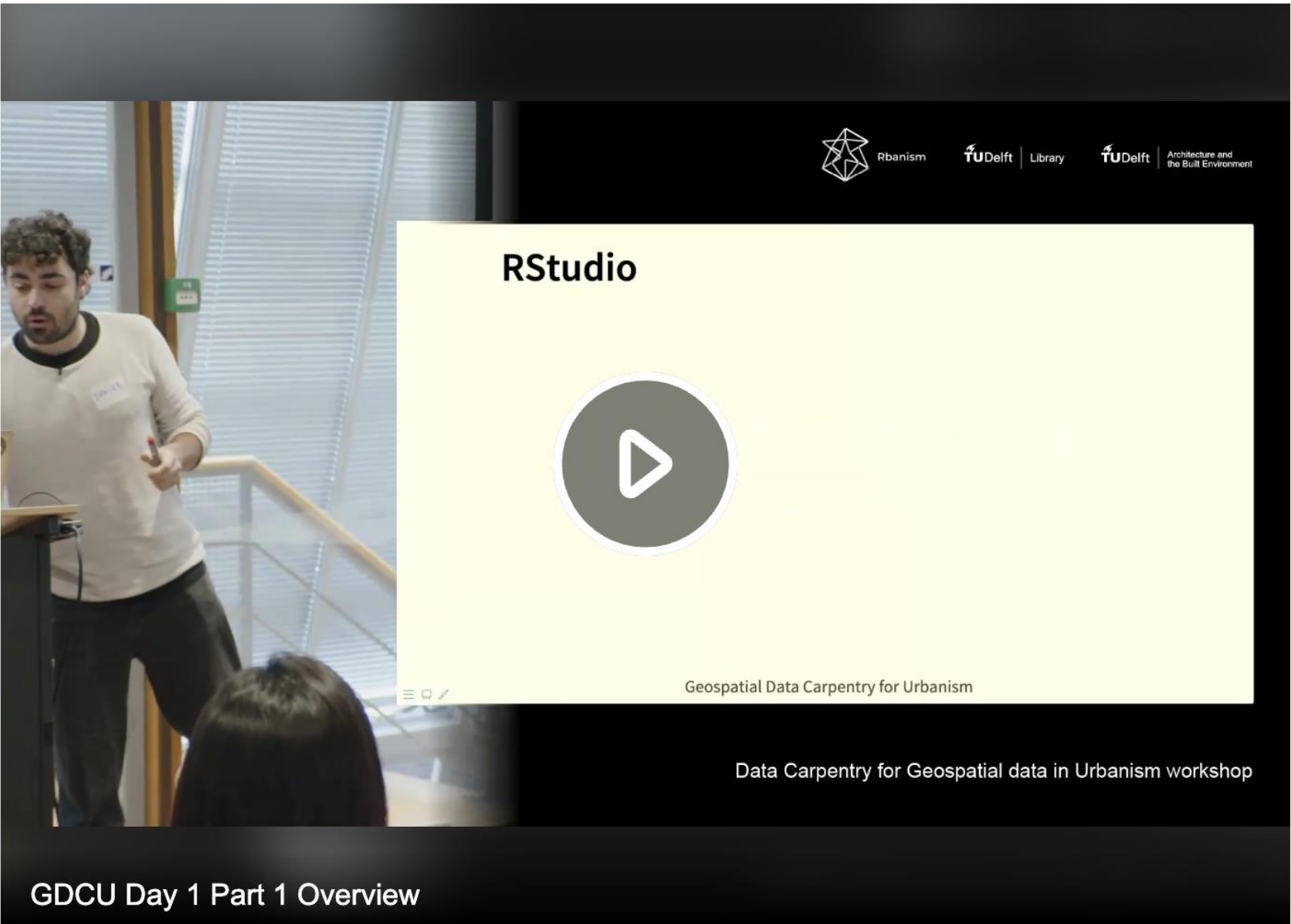
Lesson 4: OSM Data & GIS
Operations in R

Lesson 4 : OSM Data & GIS
Operations in R Part 2

Overview

What is R?

Furthermore, the R and Rstudio as your working toolset is introduced to have a better understanding of the capabilities of working with R through your projects.



On this page

Gesopatial Data Carpentry
for Urbanism with R

Episode 1: Introduction to R
and RStudio

Overview

[What is R?](#)

Setting up Rstudio

Project Management in
Rstudio

Create R Project

Create a script

Running the script

R Packages

Code commenting

Handling Paths

Variables and assignments

Download files



edu.nl/va63w

Geospatial Data Carpentry Workshop for Urbanism: : CHEATSHEET

Basics

USING LIBRARIES

install.package("here")
library(here)

ASSIGNMENT

x <- "apple"

DATA TYPES

as.character(x)	"1", "2", "one"	Character strings
as.numeric(x)	1, 2, 1	Numbers
as.logical(x)	TRUE, FALSE, T	Boolean
as.factor(x)	"1", "2", "3" Levels: "1", "2"	Strings with preset levels

VECTORS

Function `c()` joins elements of the same data type:

`c(1, 2, 4, 5)`
`c(y, x)`

Combine vectors
to create a new
one

MISSING VALUES

`is.na(x)` Is missing
`!is.na(x)` Not missing

OPERATORS

<code>x == y</code>	x equal to y
<code>x != y</code>	x not equal to y
<code>x > y</code>	x greater than y
<code>x < y</code>	x less than y
<code>x >= y</code>	x greater than or equal to y
<code>x <= y</code>	x less than or equal to y
<code>x == y & x == z</code>	Logical 'AND' operator
<code>x == y x == z</code>	Logical 'OR' operator
<code>x %in% y</code>	x belongs to a vector y



EXPLORE DATASETS

`head(df, n)` First `n` rows of dataset `df`
`summary(df)` Summary stats of `df`
`nrow(df)` Number of rows in `df`
`ncol(df)` Number of columns in `df`

Data manipulation

DPLYR

Pipes

`x %>% f(y)` or `x |> f(y)`
becomes `f(x, y)`

SUBSET & FILTER

Select columns by name.
`df %>% select(variables)`
Extract rows meeting logical condition
`df %>% filter(condition)`

CREATE NEW VARIABLE

Compute new columns
`df %>% mutate(x=mean(y))`

SUMMARISE

Summarize data
into summary table
`df %>% summarize(x=mean(y))`

GROUP CASES

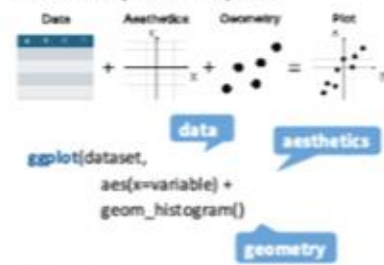
to create summaries
by category
`df %>%
group_by(variable) %>%
summarize(x=mean(y)) %>%
ungroup()`

Remove grouping

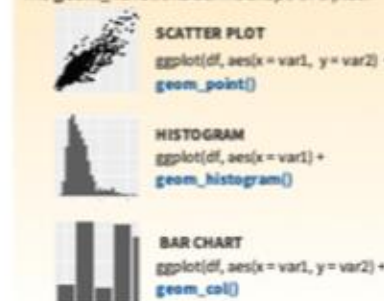
Data visualization

GGPLOT2

`ggplot2` is based on the grammar of
graphics - idea that plots are build
based on three components: data set,
coordinate system, and geoms—visual
marks that represent data points.



The `geom_` functions define shape of a plot.



TITLES AND LABELS

`labs()` function allows naming axes, adding
titles and useful legend names
`plot1 +
labs(title = "Plot title",
subtitle = "Plot subtitle",
x = "Axis X",
y = "Axis Y",
color = "Legend title")`

Vector data

SF BASICS

`st_read(dsn, layer, ...)` Read file or
database vector dataset as a `sf`
object

`st_geometry_type(x, by_geometry = TRUE)`
Return the geometry type of an object

`st_crs(x, ...)` Set or retrieve coordinate reference
system (CRS) from an `sf` object

Long output with
all CRS info

Short output with
specific parts of CRS

`st_crs(x, ...)` \$Name - Get CRS name
`st_crs(x, ...)` \$epsg - Get EPSG code

`st_bbox(obj, ...)` Return bounding box of an `sf`
object as an object of class `bbox` with `xmin`, `ymin`,
`xmax` and `ymax` values

`st_transform(x, crs, ...)` Convert coordinates of
an `sf`, `sfc`, `sfg` or `bbox` object

`st_length(x, ...)` Compute the length of a
LINESTRING or MULTILINESTRING geometry in a
projected CRS like Amersfoort / RD New
(EPSG:28992)

`st_write(obj, dsn, layer = NULL, ...)` Write `sf`
object to file

VISUALISING SF OBJECTS

`geom_sf()` visualise `sf` objects with `ggplot2`
`coord_sf()` ensures that all layers use the same
CRS, either specified with the `crs` parameter or
taken automatically from the first layer that
defines a CRS

`ggplot(data) +
geom_sf() +
coord_sf(datum = st_crs(28992))`

`sf` object
No need to specify x and y

`rainbow(n)` Create a vector of `n` colors,
optionally customized with the palette
parameter (e.g., `palette = "viridis"`)

Geospatial Data Carpentry Workshop: : CHEAT SHEET

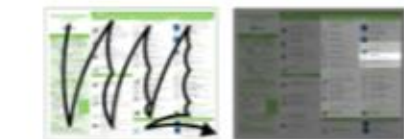
Raster Data

Thank you for making a new cheatsheet for R!
These cheatsheets have an important job:

Cheatsheets make it easy for R users
to look up useful information.

Remember that the best cheatsheets are
visual—not written—documents. Whenever
possible use visual elements to make it easier
for readers to find the information they need.

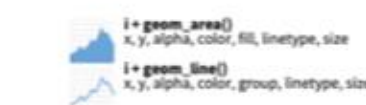
1. Use a **layout** that flows and makes it easy to
zero in on specific topics.



2. Use **visualizations** to explain concepts
quickly and concisely.

summary function

3. Use visual elements to make the sheet
scannable.



4. Use visual **emphasis** (like color, size, and font
weight) to make important information easy
to find.

`dplyr::lag()` - Offset elements by 1
`dplyr::lead()` - Offset elements by -1

YOUR LOGO
(optional)

Layout Suggestions

Use headers, colors, and/or backgrounds to
separate or group together sections.



Create a **visual hierarchy**. Help users navigate
the page with titles, subtitles, and subsubtitles

Title

SUBTITLE

SUBSUBTITLE

Fit sections to content. Try several
different layouts.

Use numbers or arrows to link
sections if the order/flow is
confusing.

Quickly identify content with a
package hexsticker (if available)



Copyright

Each cheatsheet should be licensed under the
creative commons license.
To license the sheet as creative commons, put
CC'd by <your name> in the small print at the
bottom of each page and link it to
<http://creativecommons.org/licenses/by/4.0/>

Open Street Map

BOUNDING BOX

With the `OSMdata` package, it is possible
to geocode a spatial text using the
Nominatim API. The function `'getbb'`
returns the coordinates of its bounding
box: `xmin`, `xmax`, `ymin` and `ymax`.

`osmdata::getbb("place name")`

OVERPASS QUERY

To extract and download Open Street
Map (OSM) data into R, we access the
Overpass API using a query, to which we
add OSM features defined by hierarchical
tags called keys and values. To download
data about greenhouses for example, the
key is "building" and the value
"greenhouse".

`osmdata::opq(bbox) |>
add_osm_feature(key, value) |>
osmdata_sf()`

Format of resulting
object (sf object)

The result of this query can contain
points, **lines** and/or **polygons**, each
described by a data frame.

Interactive mapping

The `leaflet` package provides a way to
create map with interactive features such
as zoom, popups, image overlay, etc.



`leaflet(x) |>
addTiles() |>
addPolygons()`

Background map
Added geometries
from x

GIS functions

BUFFER

A buffer corresponds to a circular polygon
around an 'x' feature with a specified
distance 'dist'

`sf::st_buffer(x, dist)`

UNION

A union corresponds to the combination of
polygons by removing internal boundaries

`sf::st_union(x, y, ...)` |>
`sf::st_cast(to = "POLYGON")` |>
`sf::st_as_sf()`

Format of
resulting object

CENTROID

A centroid corresponds to the
centre of mass of a geometric
object.

`sf::sf_use_s2(FALSE)`
`sf::st_centroid(x)` |>
`sf::st_transform(., crs)`

Reproject the
resulting object

INTERSECT / INTERSECTION

"Intersect" tests whether geometric objects
x and y intersect each other. "Intersection"
performs the intersection and returns an
object of the same type as x.

`sf::st_intersection(x, y)`

AREA

Computation of the area of a set of
features x

`sf::st_area(x)` |>
`units::set_units(., km^2)`

Specifies
area unit

Rbanism ...

... as a community



A community grown from our activities

5
years

10+
events

100+
members

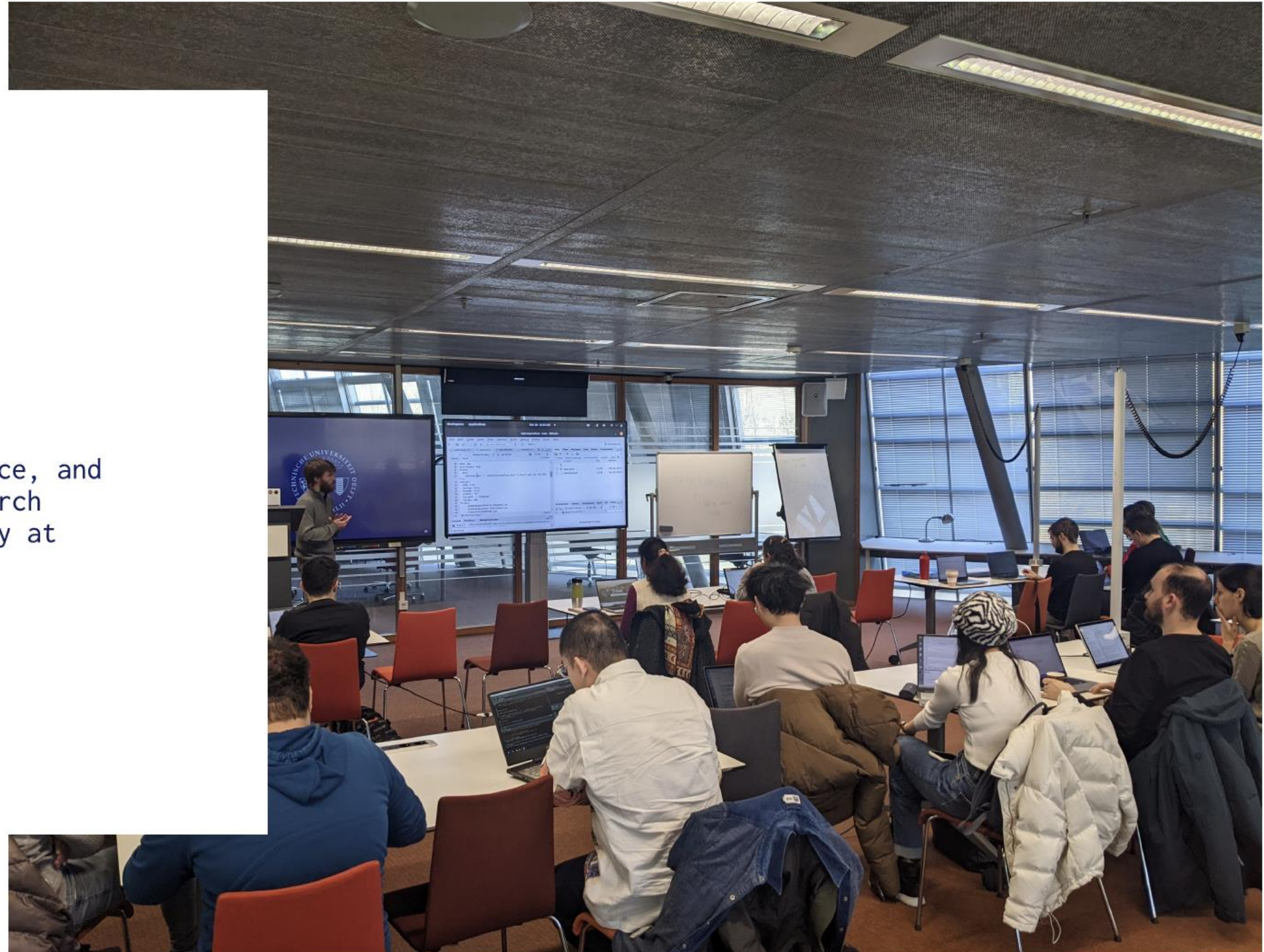


Making content open and persistent on rbanism.org

[About](#)[Resources](#)[Meetups](#)[Get in touch](#)[JOIN THE COMMUNITY →](#)

Rbanism Community

Our mission is to build capacity, competence, and confidence for working with data and research software in the urbanism research community at large.

[JOIN THE NEXT EVENT →](#)

Establishing workshop material: Geospatial Data Carpentry for Urbanism

carpentries-incubator / proposals

Code

Issues47

Pull requests

Actions

Projects

Security

Insights

Type to search

[Proposal]: Geospatial Data Carpentry with R for Urbanists #174

EditNew issue

Closed

2 of 4 tasks

cforgaci opened this issue 2 weeks ago · 5 comments

cforgaci commented 2 weeks ago · edited

Member

1. Lesson Topic

Geospatial Data Carpentry with R for Urbanists

2. Lesson Language

English

3. Draft materials

<https://github.com/Rbanism/geospatial-data-carpentry-tud.git>

4. Requirements for existing materials

☒ do your lesson materials conform to our [Code of Conduct](#)?

☐ are your materials already on GitHub and do they use The Carpentries [lesson template](#) or [The Carpentries Workbench](#)? (you can visit [the Workbench tutorial](#) to learn more about how to use our lesson infrastructure).

5. New repository creation

☒ I need a new repository created

6. Transfer existing repository

☐ my lesson meets both criteria in part 4 and I would like to transfer the repository to The Carpentries Incubator

7. Collaborators

@alwil

@ClementineCttn

Assignees

tobyhodges

Labels

share-existing-material

Projects

None yet

Milestone

No milestone

Development

No branches or pull requests

Notifications

Customize

Unsubscribe

You're receiving notifications because you were mentioned.

3 participants



Rbanism

2026

April Newsletter

Greetings Rbanists!

We hope you're doing well.

We're happy to share recent news, offerings, and highlights from Rbanism's upcoming events, activities, and education.

☕ Enjoy reading!

Rnews

Rzine: new journal to publish R notebooks



Rzine

[Publications](#) [Documentation](#) [À propos](#) [🔗](#) [🐙](#) [@](#)



Rzine

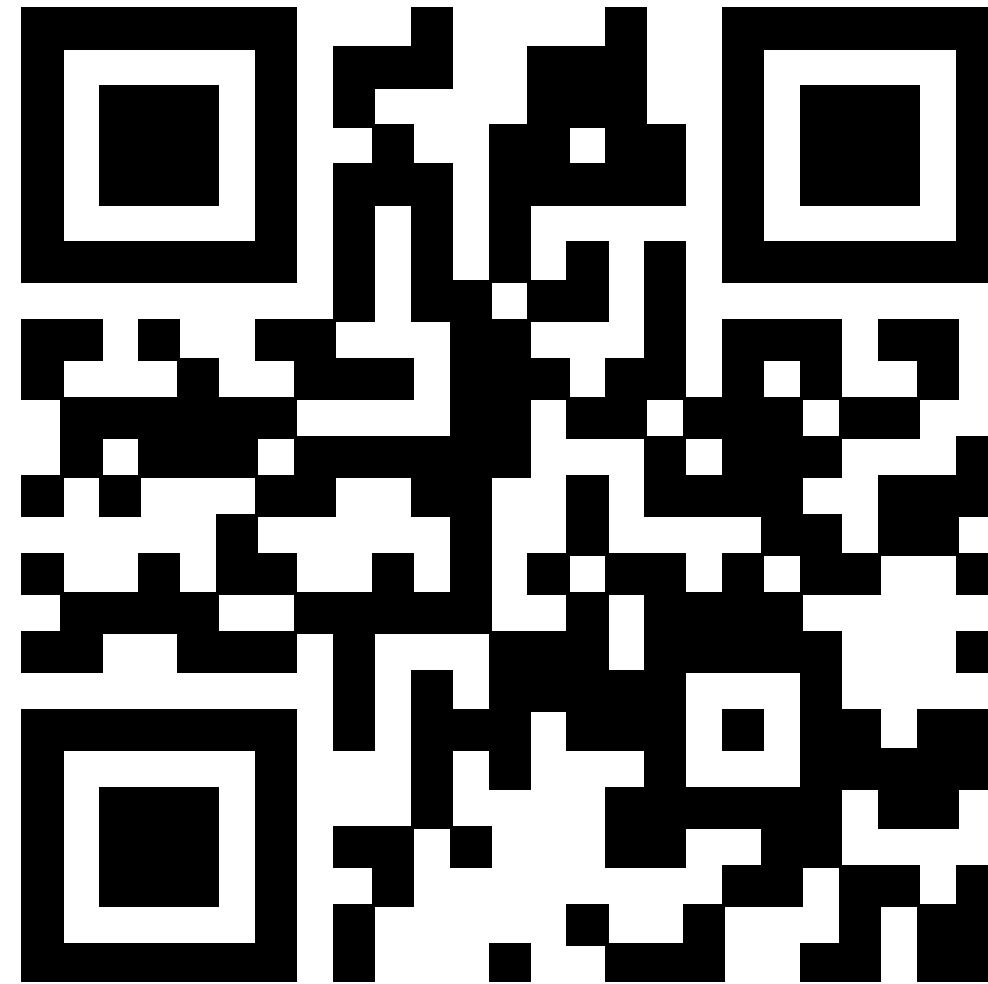
Articles de méthodes pour les Sciences Humaines et Sociales

ISSN 2743-8791 - Revue de documents computationnels

La revue Rzine propose des articles présentant des méthodes d'analyse en SHS mises en application avec le logiciel  de façon reproductible et didactique.



Become a member



edu.nl/wxx98

Rbanism

Building digital competence for reproducible, automated and scalable
research in the urbanism research community