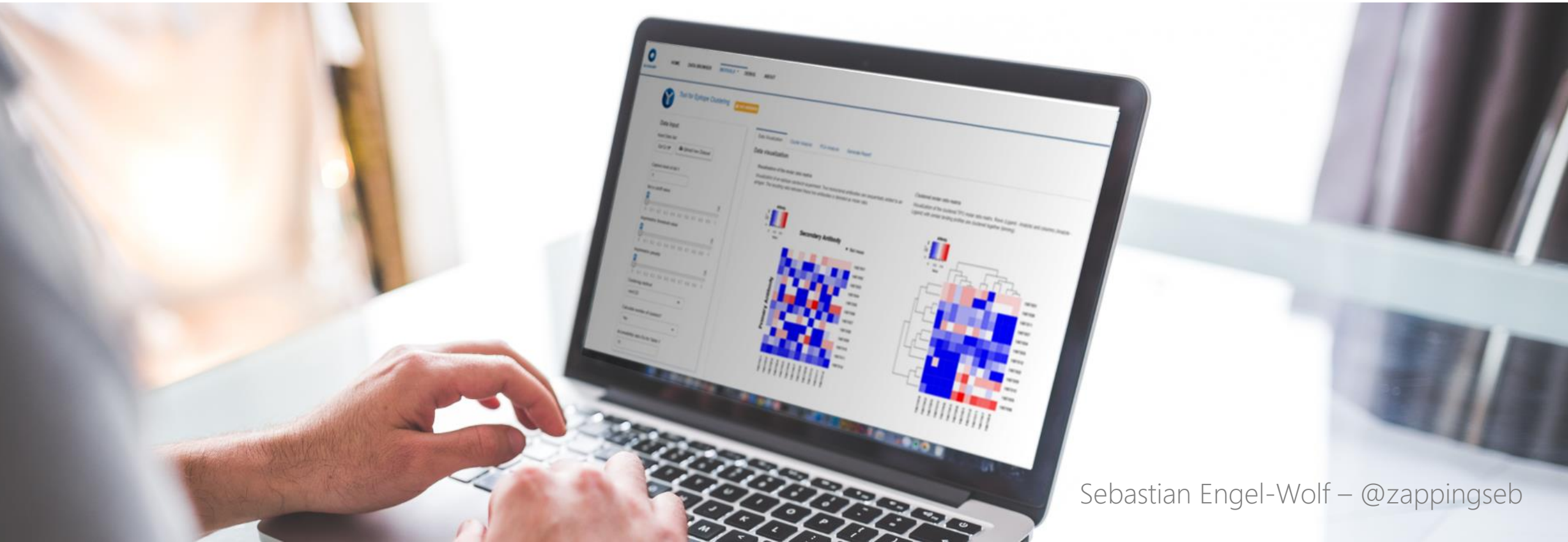
R-Shiny framework in Pharma



Sebastian Engel-Wolf – @zappingseb

Slides in here

- About me
- Projects in the Pharmaceutical space:
  - Diagnostics Clinical Study App
  - Pharma Clinical Study Framework
  - Diagnostics App to explain clustering
  - Showcase: COVID-19 dashboard
- Why R-Shiny?

About Sebastian Engel-Wolf

since 2019 - Freelance

- R-shiny platform for analyzing clinical trials
- Mathematical R-packages for analyzing clinical trials

2017 – 2019 - Biostatistician

- R-shiny platform for Diagnostics device validation

2015 – 2017 – Project Manager

- Modeling production data

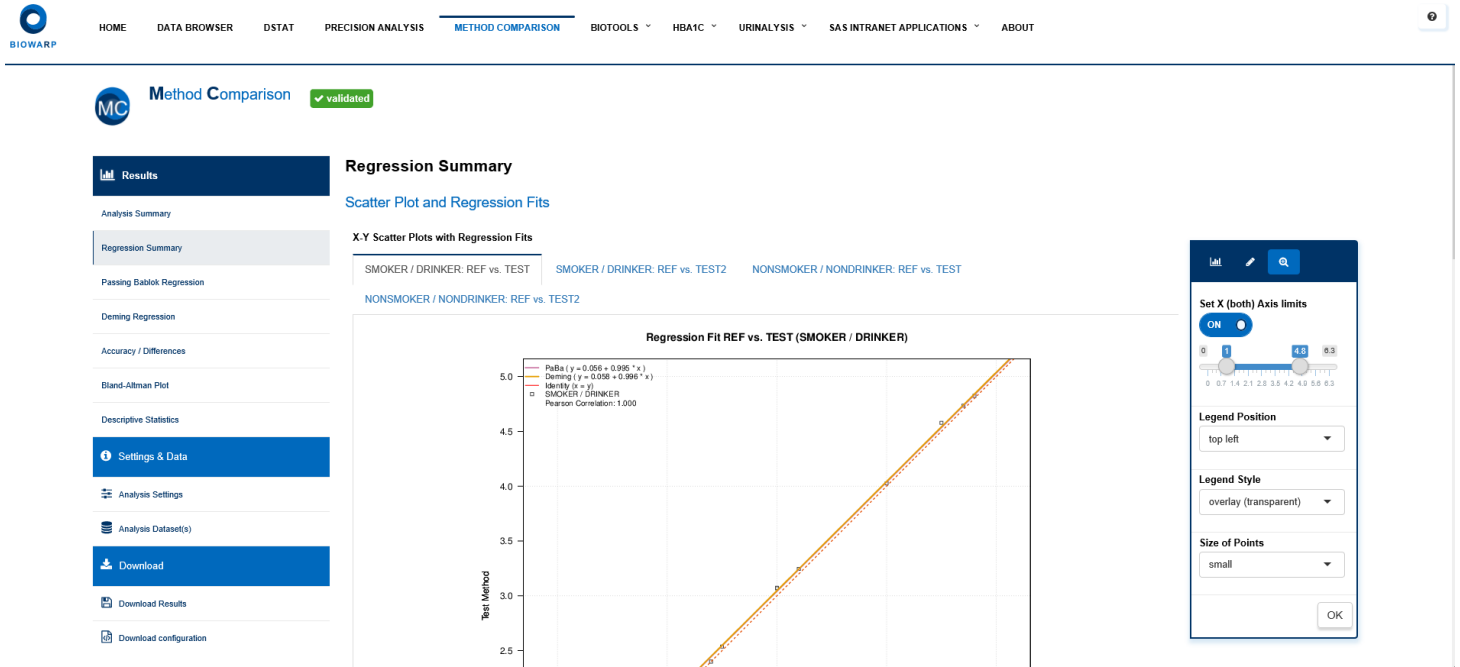
Background:

- MSc in Molecular Biotechnology
- 15+ years of programming experience
- Expert in Dashboard reporting with R + R-Shiny + Python + ggplot + matplotlib

Diagnostics Clinical Study App

bioWARP

- An app to let non-statistians analyze device data without contacting Biostats deparment
- App is conform to SOPs
- App allows PDF reporting to sign and store results



Diagnostics Clinical Study App

bioWARP

- Rstudio Webinar: https://resources.rstudio.com/webinars/the-role-of-r-in-drug-discovery-research-and-development (13:25)
- How to build a shiny truck: https://rviews.rstudio.com/2018/09/04/how-to-build-shiny-trucks-not-shiny-cars/
- A shiny Web App from LEGO— truck + trailer https://mail-wolf.de/?p=4401
- Presentation at R/Pharma https://zappingseb.github.io/RPharma2018/

Features

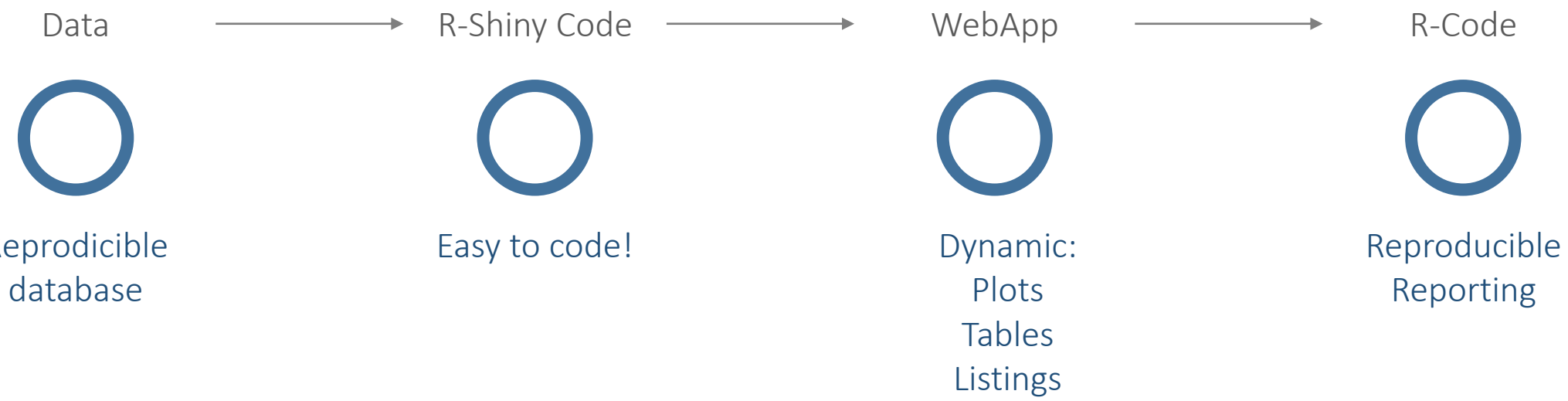
- PDF generation
- Help pages
- Backend storage of all plots, tables, outputs
- XML based analysis reproducibility
- Session logging
- Admin panel - Performance Dashboard
- 10+ additional input elements
- Custom Design
- Generalized File upload

Modules

- Descriptive Statistics
- Linear Regression
- Precision Experiment Evaluation
- Equivalence Testing
- Homogeneity Testing
- Antibody Clustering
- Urinalysis Study evaluation
- ...

Pharma Clinical Study Framework

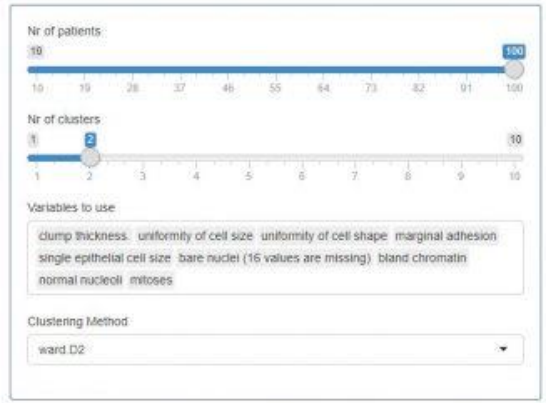
- An app-framework to enable dynamic clinical study reporting

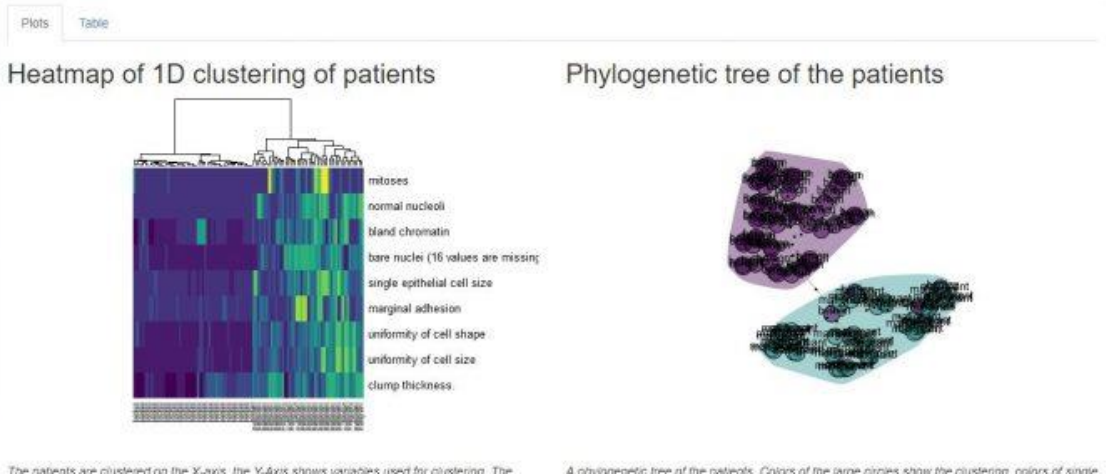


More details are confidential – ideas to be found at: https://mail-wolf.de/?p=4407

Diagnostics App to explain clustering

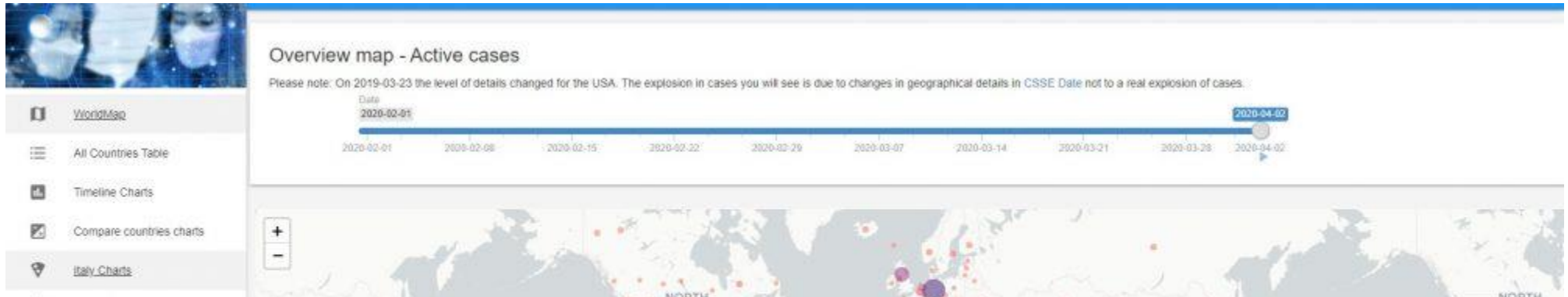
- An assay needed to cluster Antibodies by their force of attraction
- Data was only available in Excel
- Solution: A clustering visualization for R-shiny (confidential)
- Public solution: https://mail-wolf.de/?p=4344





Showcase: COVID-19 dashboard

- Map including spread of cases
- Customizable plots of different parameters:
  - # of cases
  - # of new cases
  - # of days to double # of cases
  - ....
- Material Design to work on mobile devices and tablets
- App: https://sebastianwolf.shinyapps.io/Corona-Shiny/
- Article: https://mail-wolf.de/?p=4632



Why R-Shiny?

- R is a commonly used programming language for statisticians
- WebApps allow dynamic reporting, non-statisticians know WebApp interfaces really well
- R-Shiny is simple to learn
- R-Shiny is well documented
- R-Shiny computing environments are easy to set up
- R leaves you with a lot of flexibility – see the showcase

- More:
  - https://shiny.rstudio.com/
  - https://rstudio.com/products/connect/
  - https://rstudio.com/products/shiny/shiny-server/
  - https://www.business-science.io/business/2020/03/09/shiny-vs-tableau.html

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