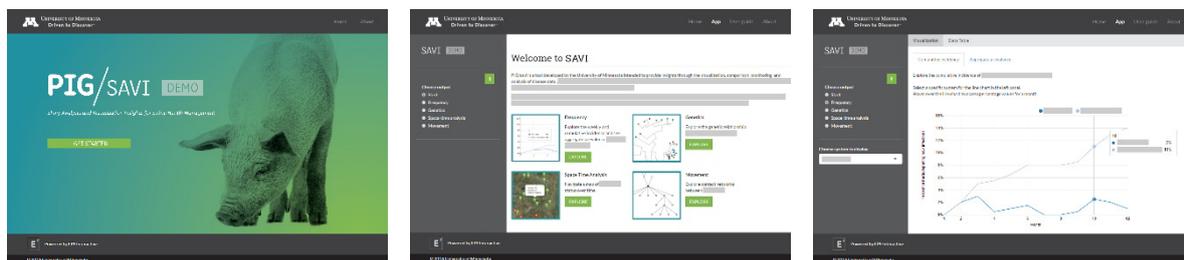


CONNECTING DATA WITH PEOPLE

Interactive web-based data visualisations with RStudio Shiny

ISVEE 15 post-conference workshop, 17-19 November 2018 (3 days)



RStudio Shiny is becoming an increasingly popular tool for web-based, interactive data visualisations. The open source framework provides a flexible way to create and output modern information dashboards while drawing on the statistical power of R in combination with commonly used web technologies. This hands-on workshop will familiarise you with RStudio Shiny programming and will cover design approaches, coding essentials and how to publish your newly created app.

Instructors

Please note, Dr Uli Muellner will lead the workshop, with additional facilitators supporting the workshop depending on number of participants.

Dr Uli Muellner, EPI-interactive

Uli is an IT professional with a background in adult teaching and computer science, including a PhD in media education. Uli is director of EPI-interactive, a Wellington, New Zealand based consultancy company where he heads the data visualisation and e-Learning portfolio. He is experienced both in the design and implementation of highly functional RStudio Shiny data visualisation dashboards in the context of human and animal health.

Dr Christina Ahlstrom, EPI-interactive, Alaska Science Centre

Christina's epidemiology experience has largely focused on molecular methods to investigate disease transmission in both animals and humans. She completed her MS degree in Food Safety from Colorado State University and has since expanded her expertise to include whole genome sequencing analysis and interpretation, the subject of her PhD at the faculty of Veterinary Medicine, University of Calgary. Christina is a savvy R user and contributed to the development of many Epi-interactive RStudio Shiny apps, including an app for genetic analysis.

Geoffrey Longuet, EPI-interactive

Geoff is full-stack software developer with a Bachelor of Software Engineering (Hons). Equipped with in-depth knowledge of RStudio Shiny coding and web technologies through his work at EPI-interactive he is experienced in interactive data visualisation dashboards. He is also involved in web and database development as well as data integration projects.

Prof Kimberly VanderWaal (guest presenter)

Department of Veterinary Population Medicine (VPM), University of Minnesota

Kim's research focuses on disease ecology, data analytics, network analysis, and animal health primarily at the population, landscape, or regional scale. Her research aims to understand factors mediating pathogen transmission processes and to model the spatial and temporal dynamics of the spread of infectious diseases.

Contact information

Dr Uli Muellner

127 Park Road, Level 3
Miramar, Wellington, 6022
New Zealand

uli@epi-interactive.com

www.epi-interactive.com

M +64 27 2922296

Workshop's learning outcomes

On conclusion of the workshop participants will be able to:

- Build a basic interactive dashboard with Shiny, incl. use of interactive controls (sliders, select menus, navigation elements, filters)
- Utilise core Shiny coding techniques (e.g. reactivity, isolate, event handling, error checking and debugging)
- Consider different coding strategies as well as pros and cons of available tools to visualise data on the web
- Integrate and configure interactive charts using Plotly charts library
- Integrate and configure an interactive map using Leaflet
- Use Git version control for Shiny development (incl. local and remote repository)
- Follow a structured design process
- Consider different strategies for publishing Shiny apps

Background and skills workshop attendees should have:

- Basic R programming skills
- Some programming experience in HTML would be beneficial; however, it is not mandatory

The history of the workshop

The team at EPI-interactive offers customised workshops which introduce or expand skills in creating interactive, web-based data visualisations in the health space since 2014. We teach our audience how to plan, design and code stunning and effective data visualisations with free or open-source technologies, covering for example RStudio Shiny, Google Maps and Charts, Plotly or D3 graphics libraries. Workshops are typically in small groups and one to three days long. The workshops draw on our project and “hands-on” experience in creating data visualisation applications and has been taught in several countries.

Workshop Specifications

Language: English

When? ISVEE 15 Post-Session workshop, 17 – 19 November 2018 (3 days)

Please bring to the workshops:

- Personal laptops with R, RStudio and Git installed:
 - R version 3.3.0 or later
 - RStudio 1.0.136 or later
 - Git download available at: <https://git-scm.com>

Registration and fee

Registration is available on the conference website:

<http://isvee.net/registration/registration-for-pre-and-post-symposium/>

Student fee: 725 USD

Regular fee: 825 USD

Workshop Contents and Schedule

Contents and schedule of workshop

Day 1

- Welcome and intro, incl. demonstrations of Shiny apps
- Getting set up and version control
- How to build a basic app
- Shiny interface layout
- Adding user interface components and reactivity
- Shiny publishing: options, pros and cons
- Case study 1: Epidemix (funded by the Royal Veterinary College, UK)
Muellner U, Fournie G, Muellner P, Ahlstrom C, Pfeiffer D. epidemix - an Interactive Multi-Model Application for Teaching and Visualizing Infectious Disease Transmission. *Epidemics*, <https://doi.org/10.1016/j.epidem.2017.12.003>

Day 2

- Utilising different data sources
- Design approaches for effective and stunning interfaces for data visualisations
- Creating dynamic user interfaces and null-checking
- Integrating interactive, vector-based graphs: Plot.ly, Google Charts, nvD3
- Top 10 tips when working with Shiny
- Case study 2: Vet Intel (funded by the New Zealand Equine Health Association)
Muellner P, Muellner U, Gates M, Pearce T, Ahlstrom C, O'Neill D, Brodbelt D and Cave NJ. Evidence in practice – a pilot study leveraging companion animal and equine health data from primary care veterinary clinics in New Zealand. *Frontiers in Veterinary Science* 3:116, 2016. <http://journal.frontiersin.org/article/10.3389/fvets.2016.00116/abstract>

Day 3

- Controlling reactivity: observe, isolate, eventReactive, observeEvent, freezeReactiveValues
- Optional: spatial visualisations with Leaflet
- Shiny debugging strategies
- Using bootstrap grid system for supporting multi-devices
- Customising the look and feel: theming
- Custom inputs
- Case study 3: SAVI: Building a suite of visualization tools for training, surveillance and research at the University of Minnesota