# Building data-driven dashboards in Julia

## Hands-on example of a vineyard monitoring dashboard

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# Agenda

1. First steps
2. Overview of Dash.jl framework
3. Notebook presentation
4. Final thoughts

# Have you ever built a dashboard?

# Instructions

Go to

**www.menti.com**

Enter the code

**3926 5142**

Or use QR code

# Which tools have you been using for data visualization?

# What is a dashboard?

- A visual display of key information and data points
- Consolidates data in one place for easy viewing and analysis

# Key features

- Data visualization (charts, graphs, maps, tables...)
- Real-time data updates
- Customizability
- Interactive elements

# Workflow

Building a data-driven dashboard

# Not so effective data visualizations...

# Data apps vs. dashboards

| Aspect | Data apps | Dashboards |
|---|---|---|
| **Purpose** | Manage, analyze, and interact with data | Provide an overview of key metrics |
| **Complexity** | High; supports advanced analytics and data manipulation | Lower; focused on visual representation |
| **User Interaction** | Interactive features like filtering and custom queries | Basic interactions like filtering and selection |
| **Data Sources** | Integrates with multiple data sources | Pulls data from predefined sources |
| **Customization** | Highly customizable, including workflows and analytics | Limited to visual arrangement and metric selection |
| **Use Cases** | Data analysts, data scientists, business intelligence | Executives, managers, stakeholders |

Comparison table: data apps vs. dashboards.

# Dash.jl

## A Julia framework to build interactive, web-based data apps

- Enables to create interactive, web-based dashboards directly from Julia code
- Eliminates the need of switching between different programming languages/tools
- Provides Julia interface to create web applications with interactive plots, graphs, maps, and other visual components

# Dash for Julia User Guide

Link here: https://dash.plotly.com/julia

Dash Julia documentation.

# Graph

- Interactive and responsive
- Built on top of plotly.js
- Support over 35 chart types including scientific plots

A simple graph made with PlotlyJS.jl.

# Dropdown

- Select by variable, parameter, column...

A dropdown list example.

# Slider

- Display a range of data
- Time series analysis and handling dates

A slider example.

# Support for Mapbox

- Bring a location technology to display geospatial data e.g. coordinates

Light

Dark

Streets

Outdoors

Satellite Streets

services.aircentre.org

# Prototype Vineyard Monitoring Dashboard

## Vineyard Monitoring Made Simple 🍇

### Location of the installed SOFIS sensors

# Now, let’s open the Jupyter notebook!

Link here: https://github.com/igaszczesniak/dashboard-julia

# Final thoughts

- Dash.jl can be a way to go to build interactive, web-based dashboards
- Alternatives are *Genie Framework* and *Bonito.jl*
- Julia is a good choice for fast prototyping, especially testing solutions that come from scientific research
- Julia has a mature package ecosystem to build data-driven applications in various fields

# What will be your next dashboard?

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# Thank you!

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