D|ONE

WE MAKE SENSE.

DATA DRIVEN VALUE CREATION

DATA SCIENCE & ANALYTICS | DATA MANAGEMENT | VISUALIZATION & DATA EXPERIENCE

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plotVR - Walk Through Your Data

Dr. Philipp Thomann
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About me

- Vita
    - PhD in Probability Theory
    - PostDoc in ML
    - Senior Consultant with D ONE Solutions
- Projects in DataScience, ML, AI, Infrastructure, Visualisation, Coaching
- (Co-)Creator of
    - liquidSVM - A fast and versatile SVM implementation
    - Nabu - vocabulary drilling tool
    - NLPeasy - Easy Peasy Language Squeezy
    - ...and introducing:
        - PlotVR - walk through your data

About D ONE Solutions

- Consultancy based in Zurich
- ~ 40 Consultants, a third with PhD
- Consulting in all aspects of data driven value creation
    - Setup DWHs (DataVault 2.0, HELT)
    - Visualisation / Dashboards (Tableau, PowerBI, Qlik, D3, ...)
    - AI/ML/Data Science Projects (Python, R, Microsoft Cognitive Services, …)
    - Data Science Infrastructure (Jupyter, RStudio Server, Docker, …)
    - Strategic Consulting
- Investment in StartUps (WinJi, Skunk)
- Supporting Society / Industry with Talks, Education, Interest Groups, …
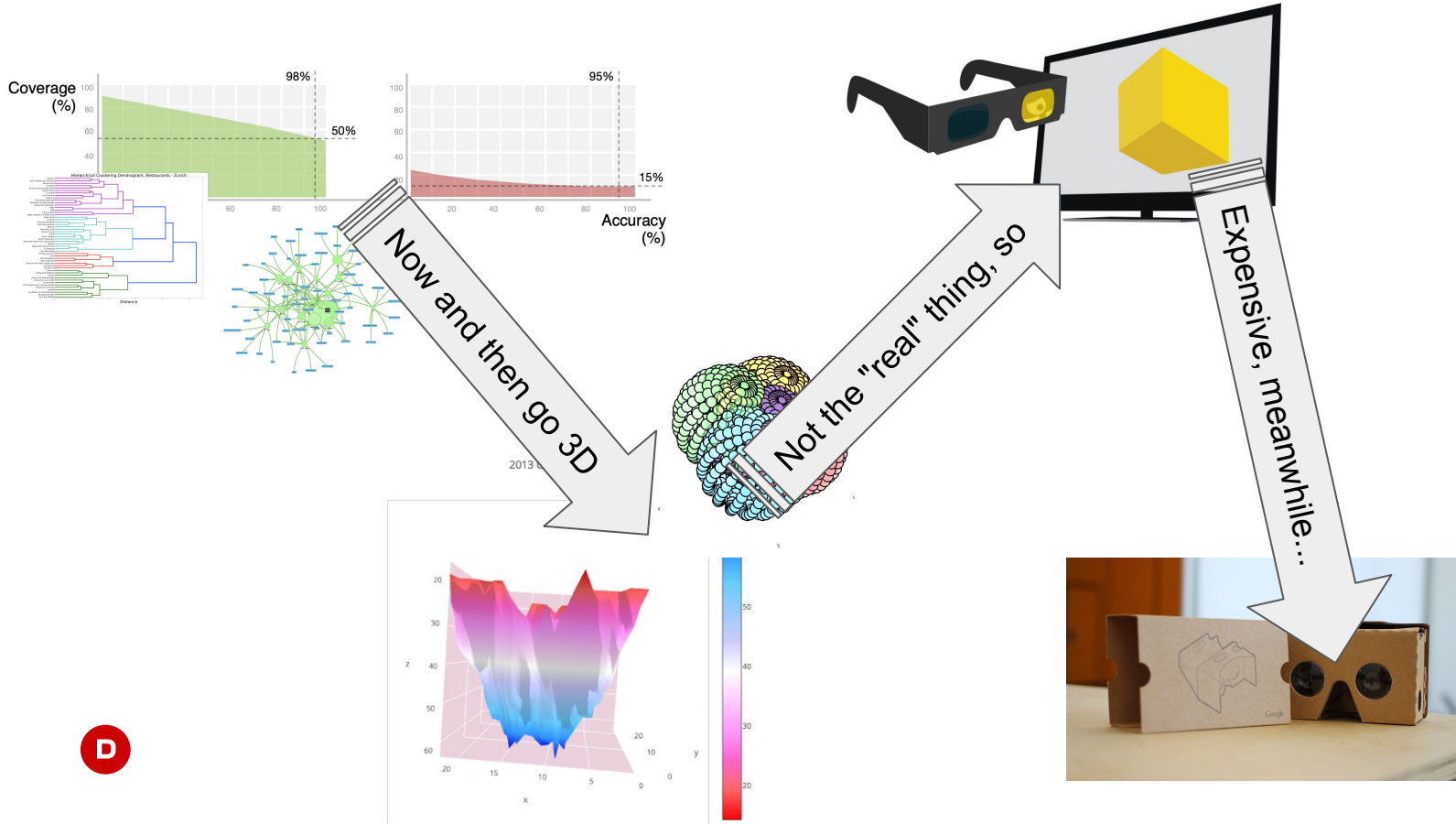- Projects mostly in Switzerland, some also abroad

Interested? We're hiring! www.d-one.ai

What is plotVR about?

Data Scientists love to visualise…

Coverage (%)

98%

50%

95%

15%

Accuracy (%)

Now and then go 3D

Not the "real" thing, so

Expensive, meanwhile…

2013

But there are some issues to solve here...

- How do we bring the data from the workstation to the mobile device?
- Can we do both VR and AR?
- Can we do it in HTML or do we need an app for that?
- How do we navigate when we are in VR?
- Does it need to cost something?
- Can I create all that in my own free time?

Features Matrix

	VR	AR	3D	Technology	Availability
HTML	✓ (ugly on iOS)	✗ (no nice lib?)	✓	three.js	GitHub
iOS	✓	✓	✓	SceneKit, ARKit, GVR	GitHub
Android	✓	planned	planned	OpenGL, ARCore, GVR	GitHub

Demo

If Demo-Gods are not willing...

```python
import plotvr
plotvr.start_server_process()
```
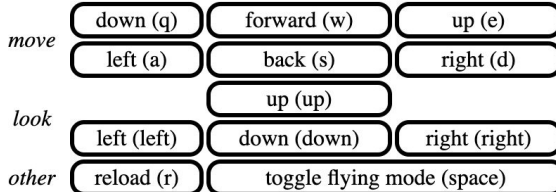
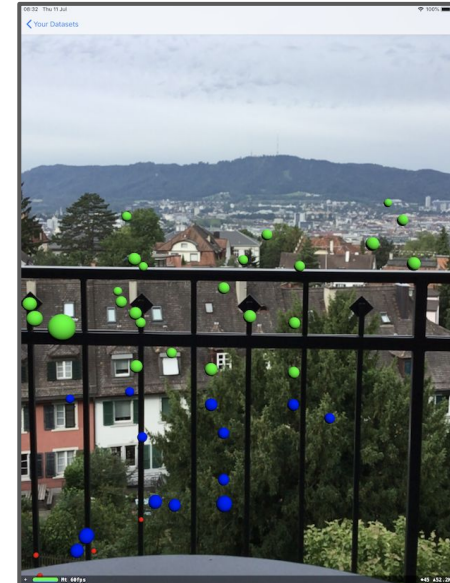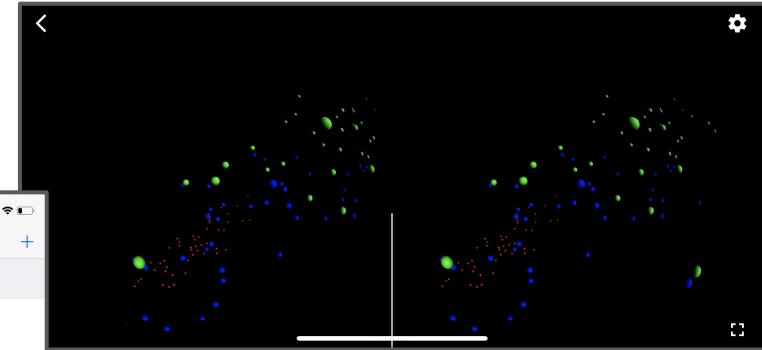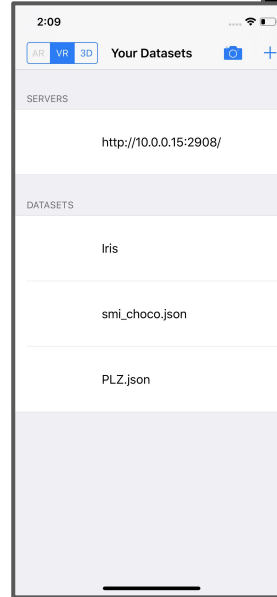Visit: http://localhost:2908/index.html


```python
from sklearn import datasets
iris = datasets.load_iris()
```

```python
plotvr.plotvr(iris.data, iris.target)
```

```python
plotvr.controller()
```

move	down (q)	forward (w)	up (e)
	left (a)	back (s)	right (d)
look		up (up)	
	left (left)	down (down)	right (right)
other	reload (r)	toggle flying mode (space)	

Devices 2, Controllers 5, having focus: 1
http://localhost:2908/index.html Copy

About

Architecture

Jupyter

plotvr to 10.0.0.1:2908

<iframe />

Controller (HTML)

10.0.0.1:2908/keyboard.html

R

plotvr to 10.0.0.1:2908

HTTP-POST: data

Websocket: key, status

HTTP-POST: data

Server (Tornado)

listen on 10.0.0.1:2908

HTTP-GET: data
Websocket: key, status

plotAR (Swift)

http://10.0.0.1:2908

Browser (three.js)

http://10.0.0.1:2908

plotVR (Java)

http://10.0.0.1:2908
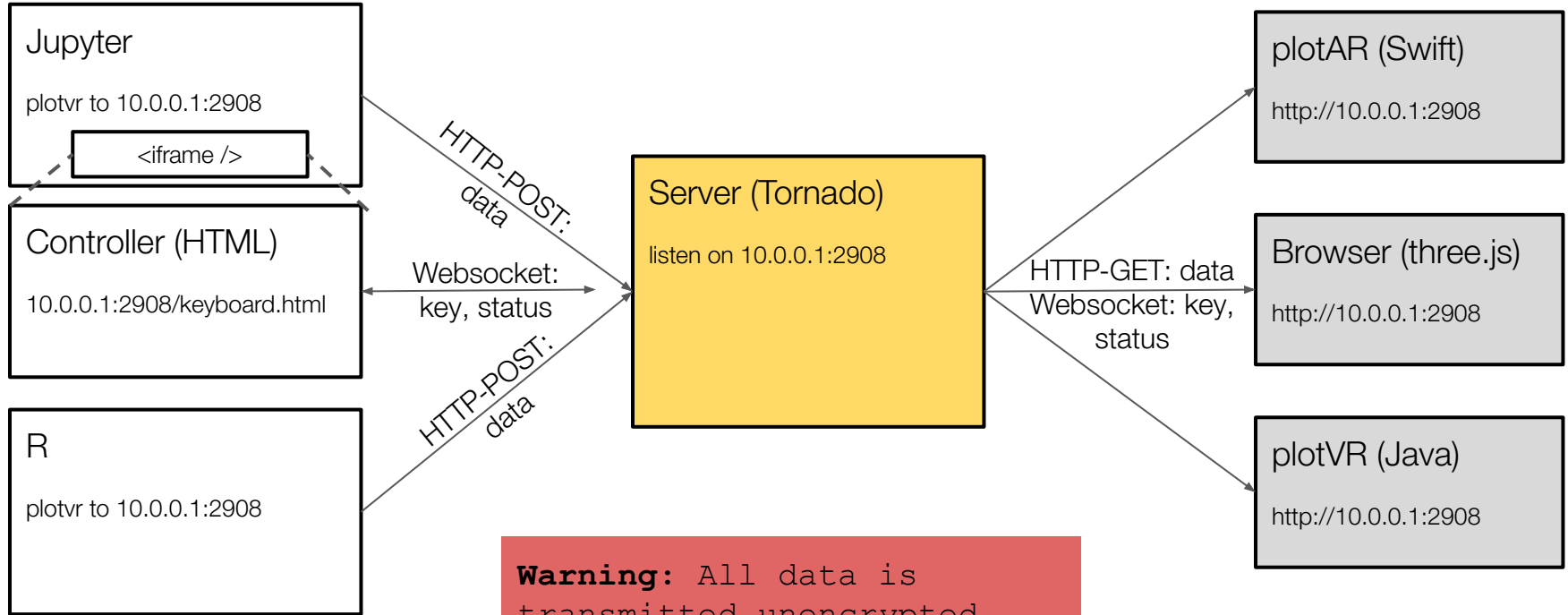
Warning: All data is transmitted unencrypted and everybody can connect!

12

Can I haz plotVR?

- Python:
    - pip install "git+https://github.com/thomann/plotVR#egg=plotvr&subdirectory=plotVR-py"
- R:
    - devtools::install_github('thomann/plotVR', subdir='plotVR-R')
- iOS-App
    - https://github.com/thomann/PlotAR-ios (needs XCode and a free personal team)
    - To have you as an early tester: philipp.thomann@d-one.ai
    - Soon via AppStore TestFlight with a shared public link?
- Android-App:
    - https://github.com/thomann/plotVR-android
    - https://github.com/thomann/plotVR-android/releases

Outlook / Vision

- Add text, lines, surfaces to 3D plots
- Make scenery nicer
- PyPI, CRAN, AppStore, GooglePlay
- Solidify protocol

Ideas:

- HTTPS / Authentifcation / Authorisation
- User Jupyter-Tornado as server?
- Interface to plotly, ggplot?
- Namespaces on server → central plotVR server, e.g. on cloud/premise

Thanks

- All the giants' shoulders this project stands on:
  Cardboard, GVR, ARKit, Jupyter, Tornado, requests, pyqrcode, three.js, …
- D ONE for being a really cool employer to send me here
- EuroPython for giving me the opportunity to work more on this!
- And all the future contributors to these projects ;-)

LET'S MAKE SENSE

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