PyStar

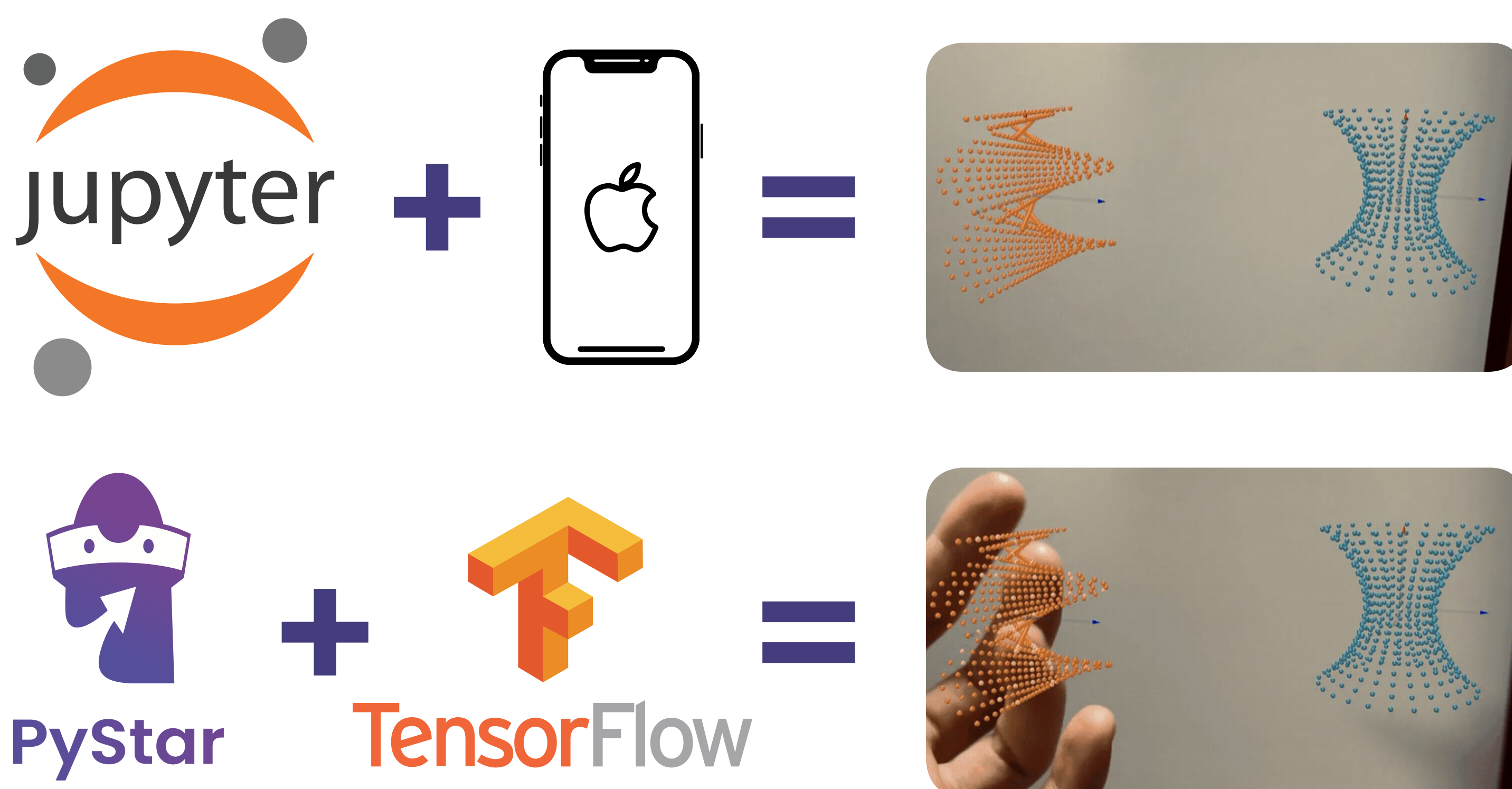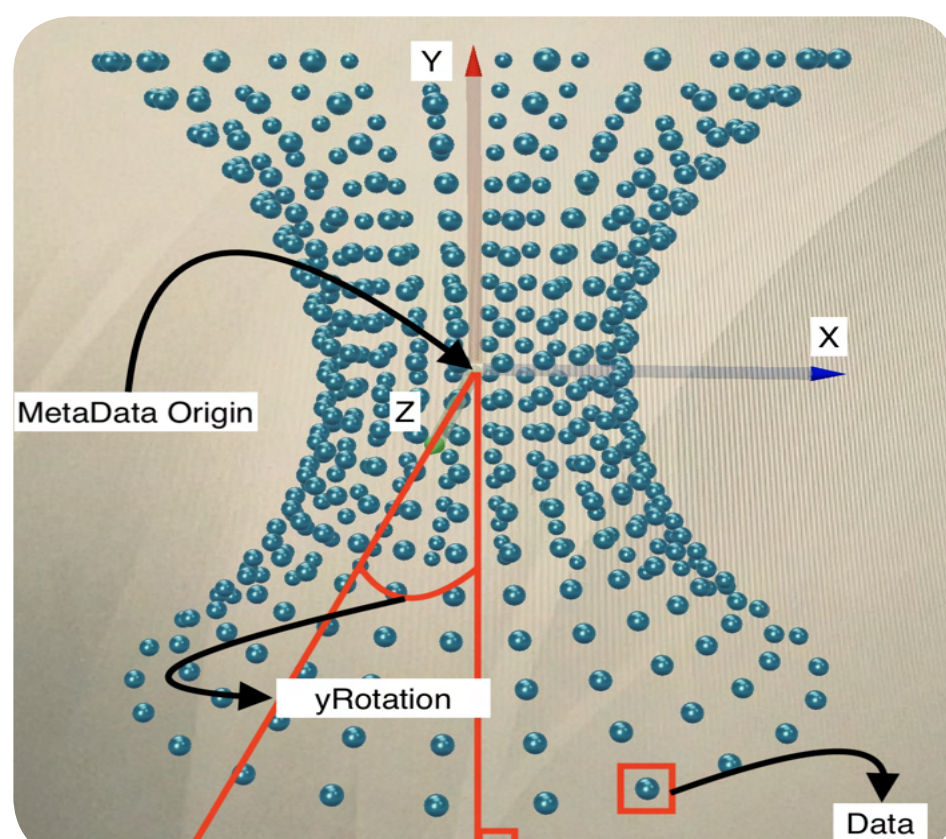## Python Smooth Augmented Reality

Mau Hernandes, Ph.D. : PyCon US 2021

PyStar is a Python module to quickly visualise and update data in Augmented Reality via its companion App
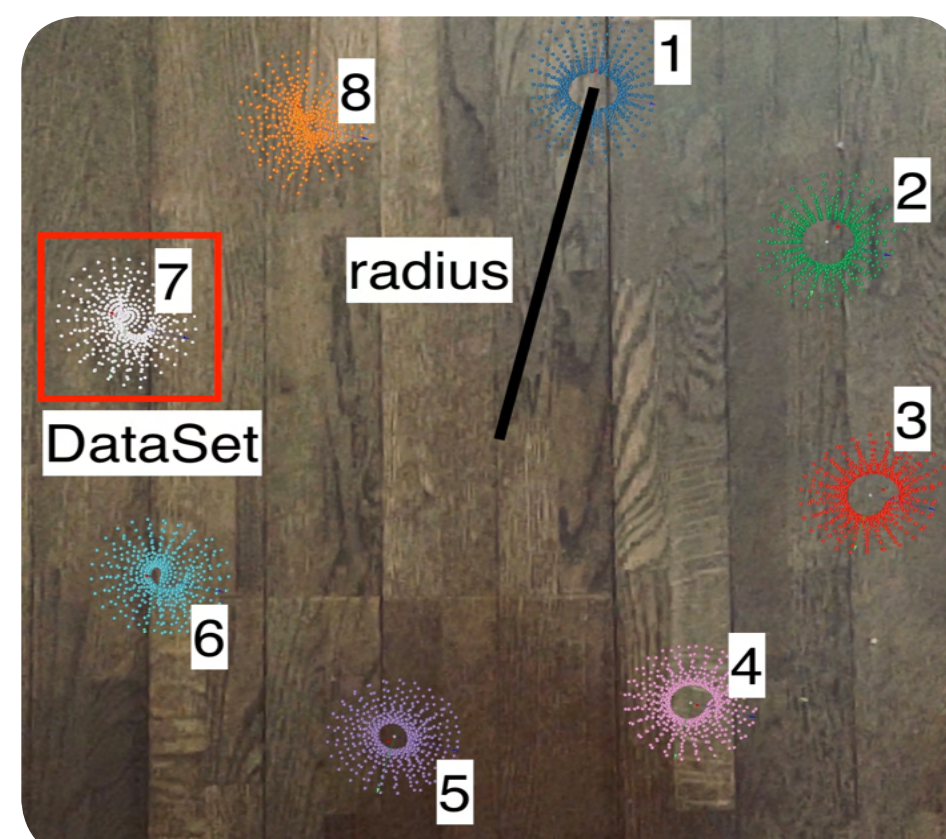
jupyter **+** 📱 **=**

PyStar **+** **TensorFlow** **=**

With hand segmentation you can even **'touch'** the data

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1. Low-level API for fine-tune plots | 2. High-level API for Space immersive scenes | 3. Realtime update

With low-level API the data scientist can control plot location, rotation, size, but also how the data looks like.

With high-level API data scientist canfocus on multiple plots and its scene placement in the space. PyStar hides all complications.
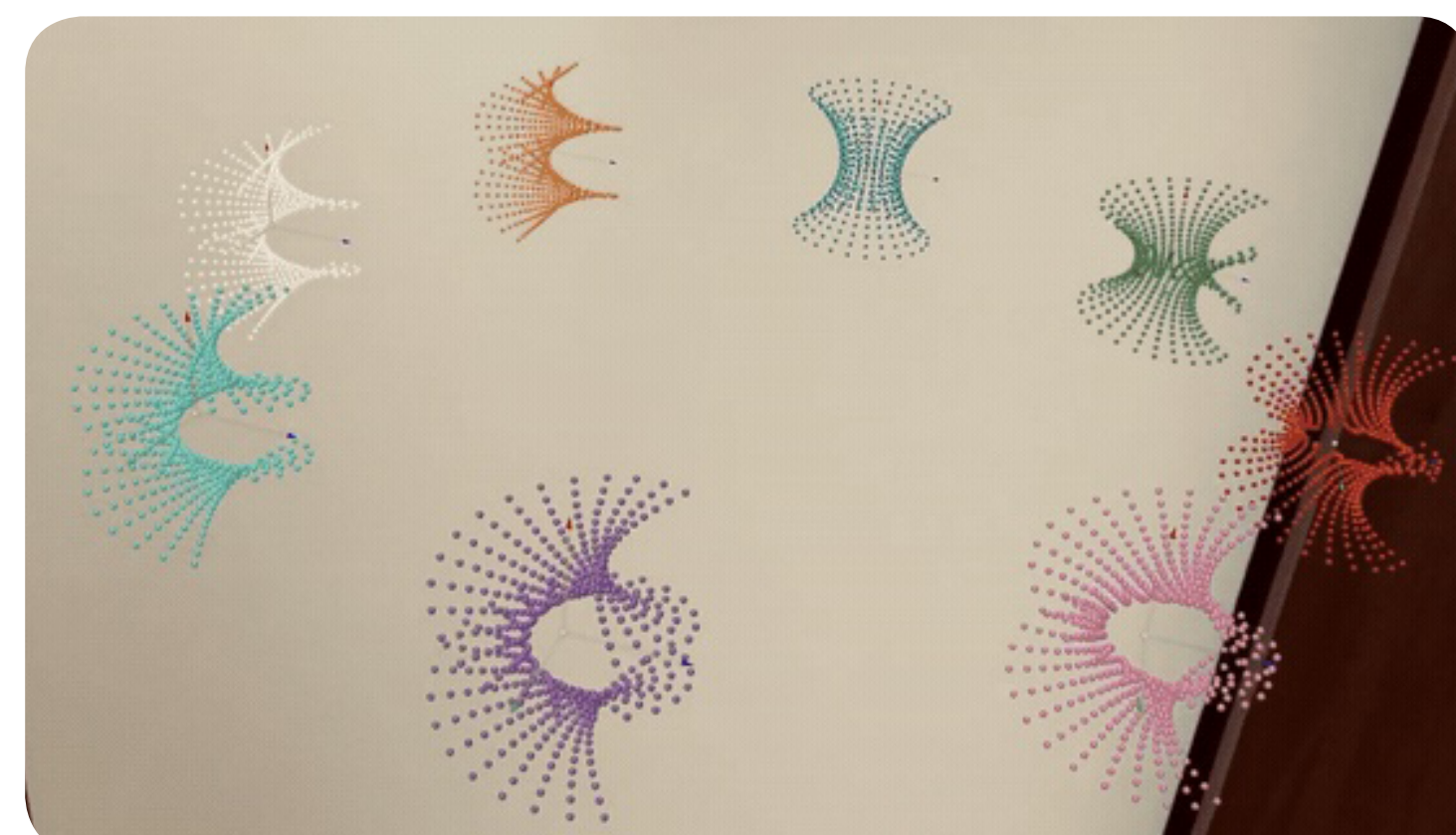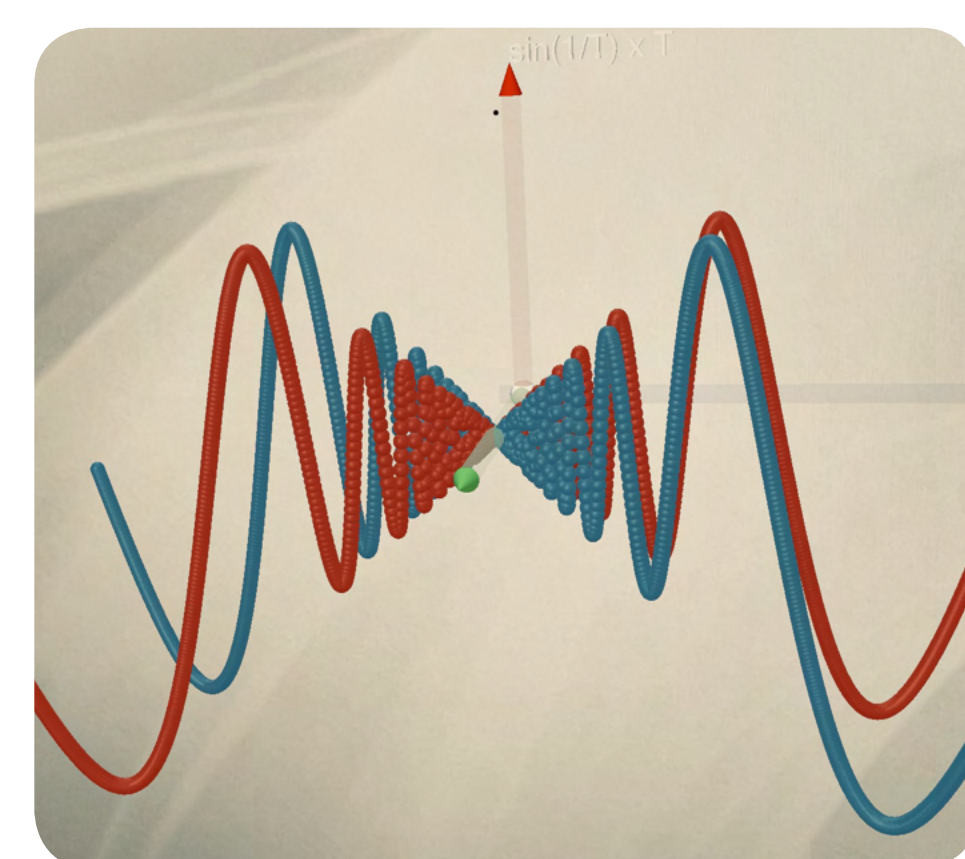
Catenoid to Helicoid isometry plotted in cylindrical scene designed using PyStar high-level API

Visualise Data in AR with few lines of Code

```
1  import numpy as np
2  import math
3  import pystar.pyplot as pltAR
4
5  X = np.arange(-0.3,0.3,0.0005)
6  Y = [math.cos(math.pi*x) for x in X]
7  Y = [x*math.sin(1/(x)) for x in X]
8  Zplus  = [i for i in range(len(X))]
9  Zminus = [i for i in range(len(X))][::-1]
10
11 workspace = pltAR.Workspace(title="Calculus", name="Calculus",
12                     description="Functions within reach.",
13                     force_creation=True)
14 scene = pltAR.scene(scene_template="simple",
15                     title="sin(1/T) x T")
16 pltAR.scatter(X,Y,Zplus)
17 pltAR.scatter(X,Y,Zminus)
18 pltAR.design()
```

A popular calculus function visualised with a few lines of code (left image)

The function $x \cdot sin(\frac{1}{x})$ visualized in AR using PyStar scene API (higher level API).