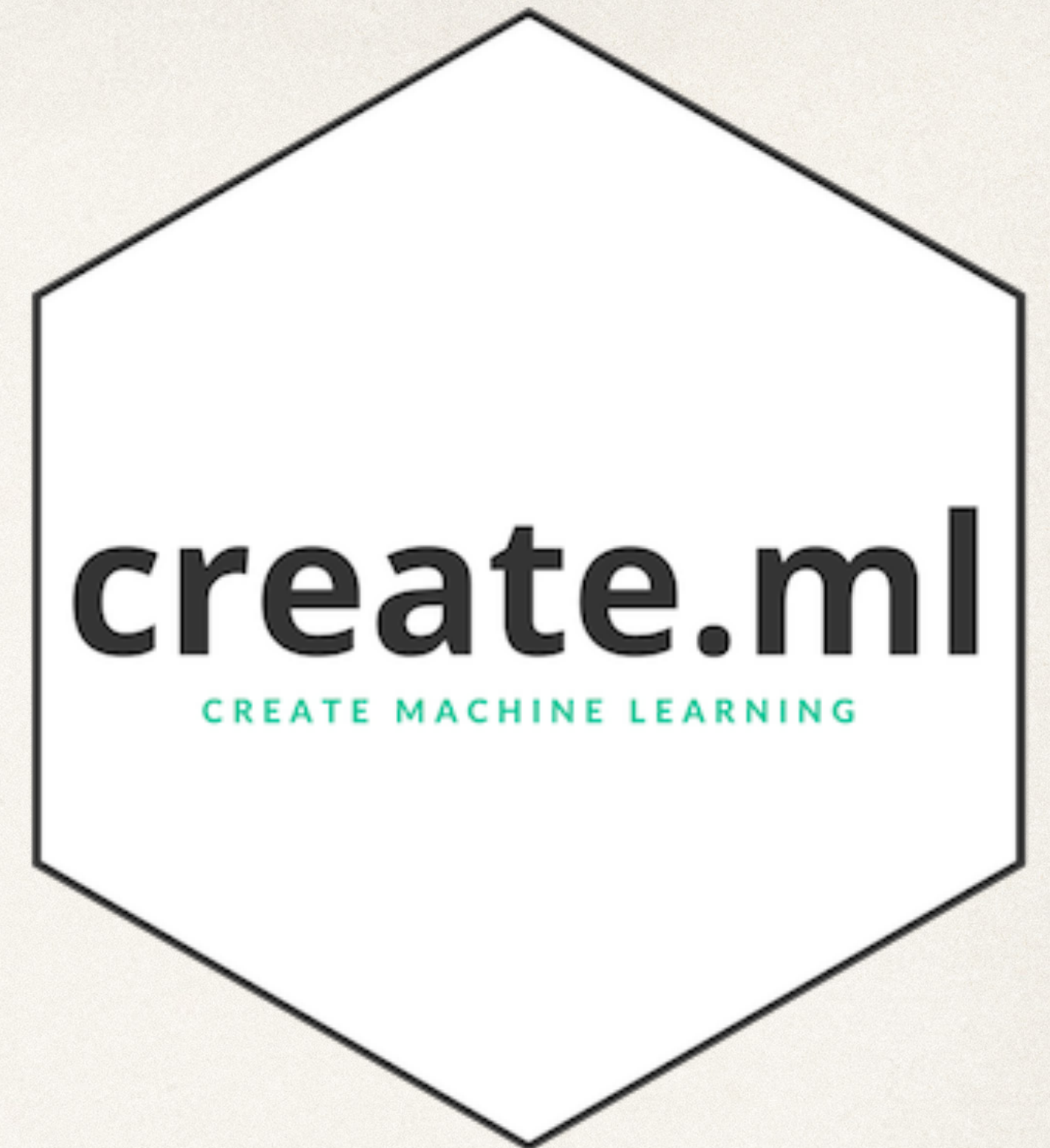


#ODSC

**OPEN
DATA
SCIENCE
CONFERENCE**

London | Nov. 19 - Nov. 22 2019



Make Beautiful Web Apps from Jupyter Notebooks

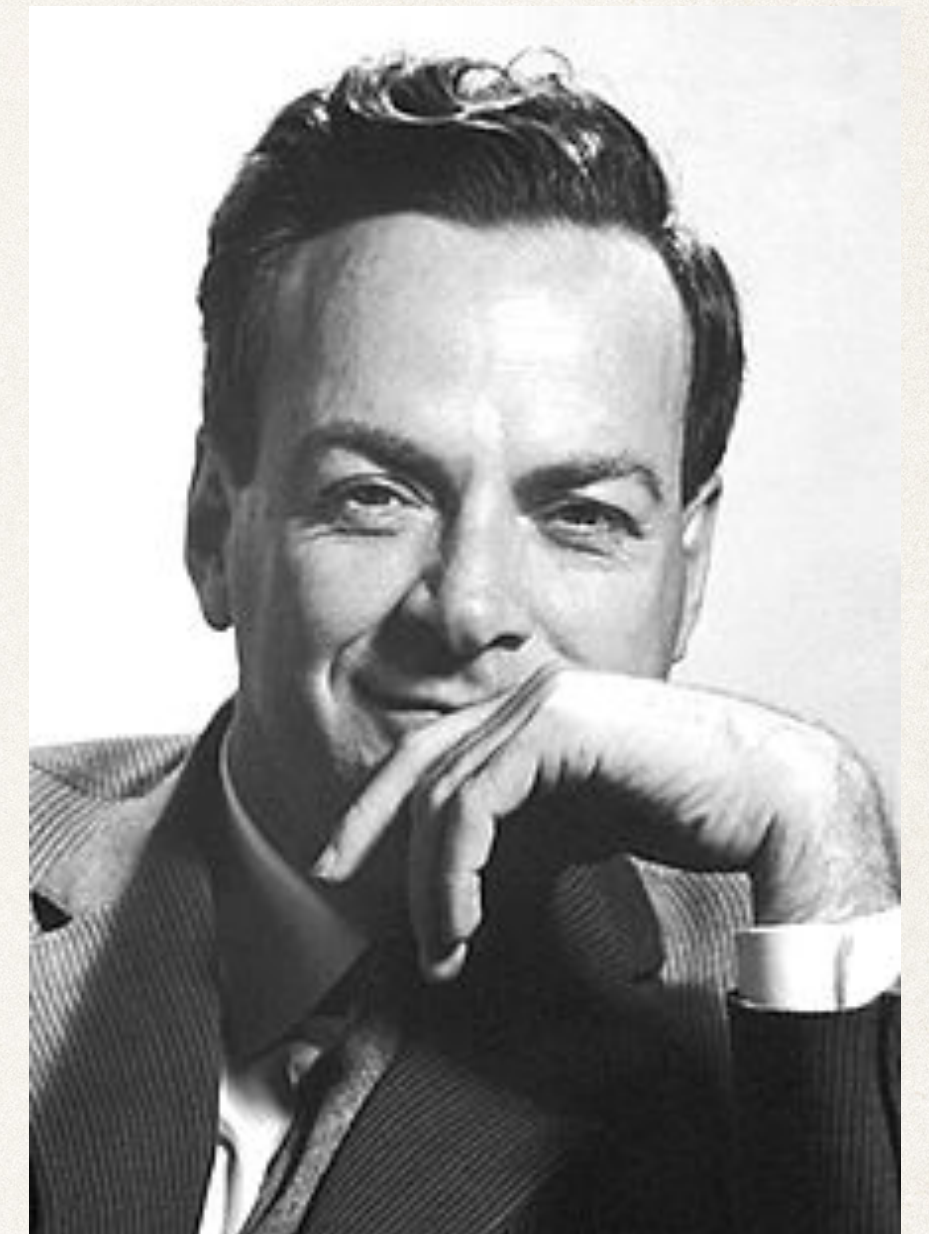
Michal Mucha

11/20/2019

@jeremimucha | <https://create.ml>

Welcome!

- Have you done the preparation? :)
- Connect & collaborate with those around you!



wikipedia.org

Requirements

- Anaconda 3
- `pip install -r requirements.txt`
- You can access the notebooks through Binder
- <https://create.ml/odsc2019>

What makes Jupyter so great?

- Visual
- Beautiful
- Interactive, rich with media
- Ability to inspect what's going on at every step
- Data-driven storytelling
- Infinite freedom of coding

How do you deliver your work?

- Packaged code
- Notebooks
- Scripts
- Reports
- Documents
- Presentations
- Spreadsheets
- Apps

Is your deliverable final?
Or is it part of a development process?

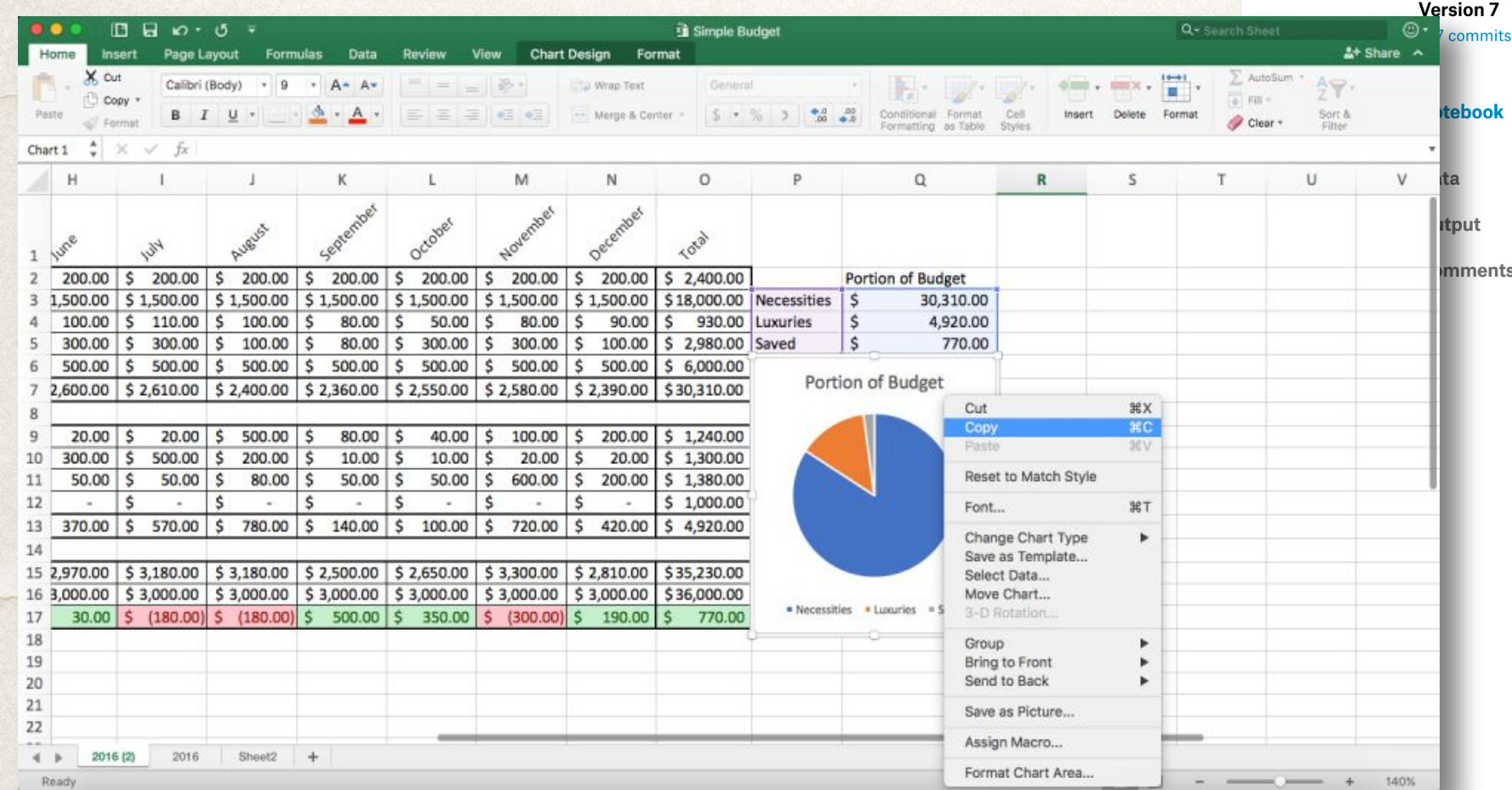
Cognitive load

Is it easy to understand the meaning?

- Spreadsheets
- PDFs
- Presentations
- Code + outputs
- ... Slick web apps? :)

Examples

Good old
MS Excel



Keras EfficientNet B2 Starter code
Python notebook using data from [RSNA Intracranial Hemorrhage Detection](#) · 3,653 views · 7h ago · starter code, deep learning, classification

```
epochs = 1,
callbacks = [ModelCheckpointFull('model.h5')],
verbose = 1)

# Starting with the 6th epoch we create predictions for the test set on each epoch
if epoch >= 1:
    preds = predictions(test_df, model)
    submission_predictions.append(preds)

===== EPOCH 0
[604508 148707 260133 171475 667824]
[ 62 285 357 753 895]
Downloading data from https://github.com/Callidior/keras-applications/releases/download/efficientnet/efficientnet-b2_weights_tf_dim_ordering_tf_kernels_autoaugment_notop.h5
31940608/31936256 [=====] - 1s 0us/step
Epoch 1/1
3898/3898 [=====] - 2950s 757ms/step - loss: 0.1081 - acc: 0.9623 - auc: 0.9086 - val_loss: nan - val_acc: 0.9660 - val_auc: 0.9462

Epoch 00001: saving model to model.h5
===== EPOCH 1
[324042 445583 70472 362617 114485]
[ 62 285 357 753 895]
Epoch 1/1
3679/3898 [=====>..] - ETA: 2:21 - loss: 0.0862 - acc: 0.9696 - auc: 0.9637

/opt/conda/lib/python3.6/site-packages/keras/utils/data_utils.py:616: UserWarning: The input
1584 could not be retrieved. It could be because a worker has died.
UserWarning)
```

Code and results
Documents

Web app
rendered from a notebook



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Knowledge sharing as a business process

- Make your work more engaging to your audience
- Change the way people think by giving them an opportunity to interact
- Spread the maker culture - emphasize doing

About me

- Data Science and Data Engineering - consulting and training
- Academic research (mobile phone data, smart meter data)
- Commercial projects (time series prediction, decision simulation, revenue modeling, visualization, building apps, data strategy)
- Husband and dad
- ❤️ boxing, cycling, hiking in the mountains 🏔️ and traveling

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Lab

- Real decision, real stakeholders
- Complicated set of influences
- Multiple outcomes
- Let's go:
 - create.ml/odsc2019
 - open the notebook titled "Typical workflow"

Ok that's great, but...

How can others use it without you?

- Well, get good at working in Python..
- Ask a team to build it..
- Not too easy! Even though it's in the browser
- Export to the usual suspects

Making ideas accessible

- The easier it is, the more it gets used
- The simpler it is, the more room for deep thought
- Attention is a precious resource

Recap - Pinnacle

- Proactive, curious state of mind
- Attractive interface
- Low cognitive expense
- Focus on the right set of questions

Craft experiences

- Build apps to create experiences of understanding
- You need great tools to do it quickly and consistently

A great year for visualization

- Panel — June 3rd .. or before!
- Voila — June 11th
- Streamlit — October 1st
- Other great active projects: Dash, Bokeh
- Very luxurious condition:
- tomato tomahto, all organic and delicious!

Shout out to Voila authors

Thank you!

- quantstack.net
- [@maartenbredde1s](https://twitter.com/maartenbredde1s)

Stories from the field



Hacker News [new](#) | [past](#) | [comments](#) | [ask](#) | [show](#) | [jobs](#) | [submit](#)

[login](#)

▲ **Streamlit: Turn a Python script into an interactive data analysis tool** ([towardsdatascience.com](#))

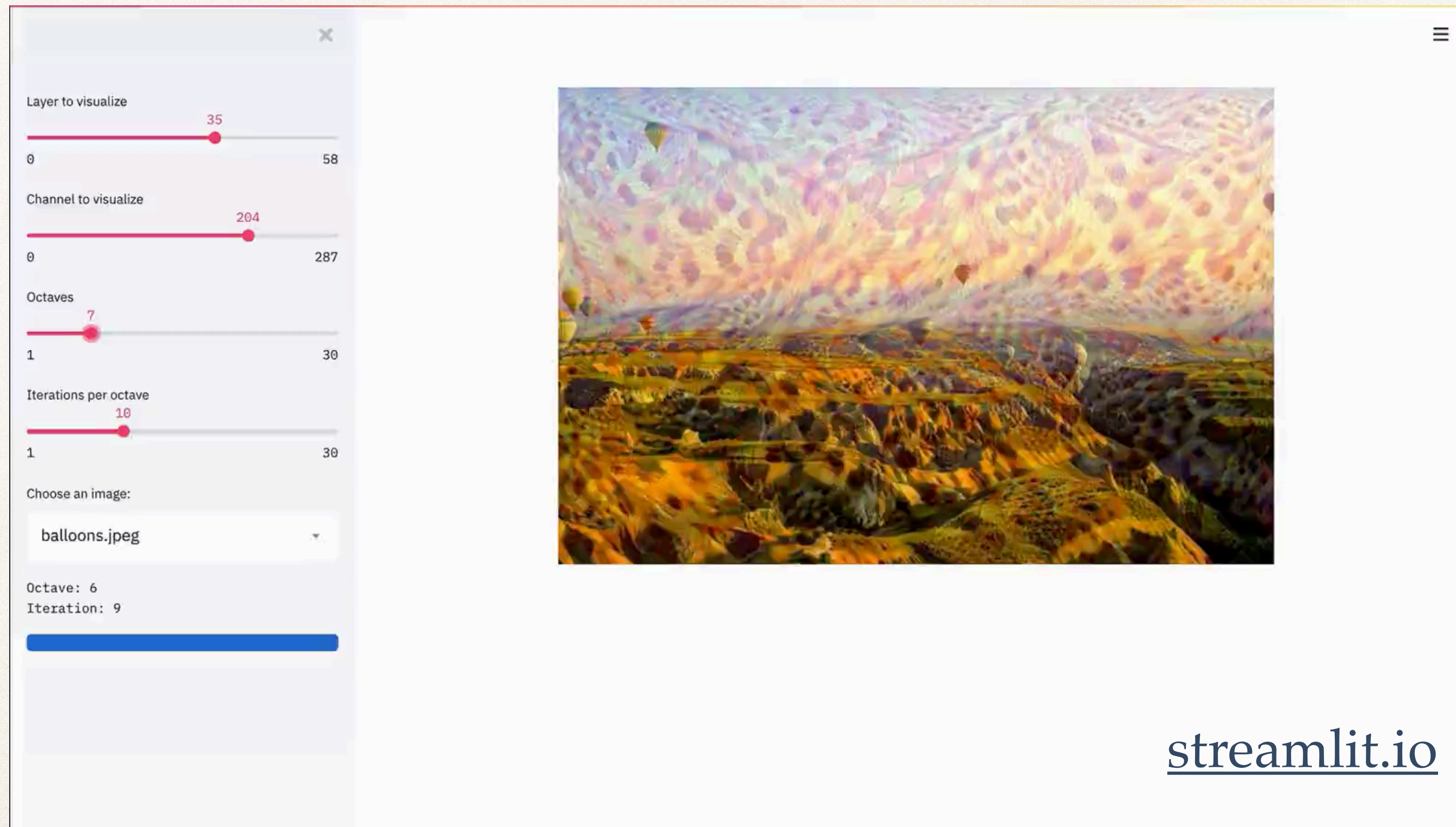
470 points by [danicgross](#) 23 days ago | [hide](#) | [past](#) | [web](#) | [favorite](#) | [65 comments](#)

▲ [adenverd](#) 23 days ago [-]

This looks really slick, can't wait to try it out!

If anyone is curious about other tools in the same space, our data scientists use Dash[1] and plotly to build interactive exploration and visualization apps. We set up a Git repo that deploys their apps internally with every merge to master, so they're actually building and updating tools that our operations, marketing, etc teams use every day.

Panel, Streamlit & Dash serve scripts



streamlit.io

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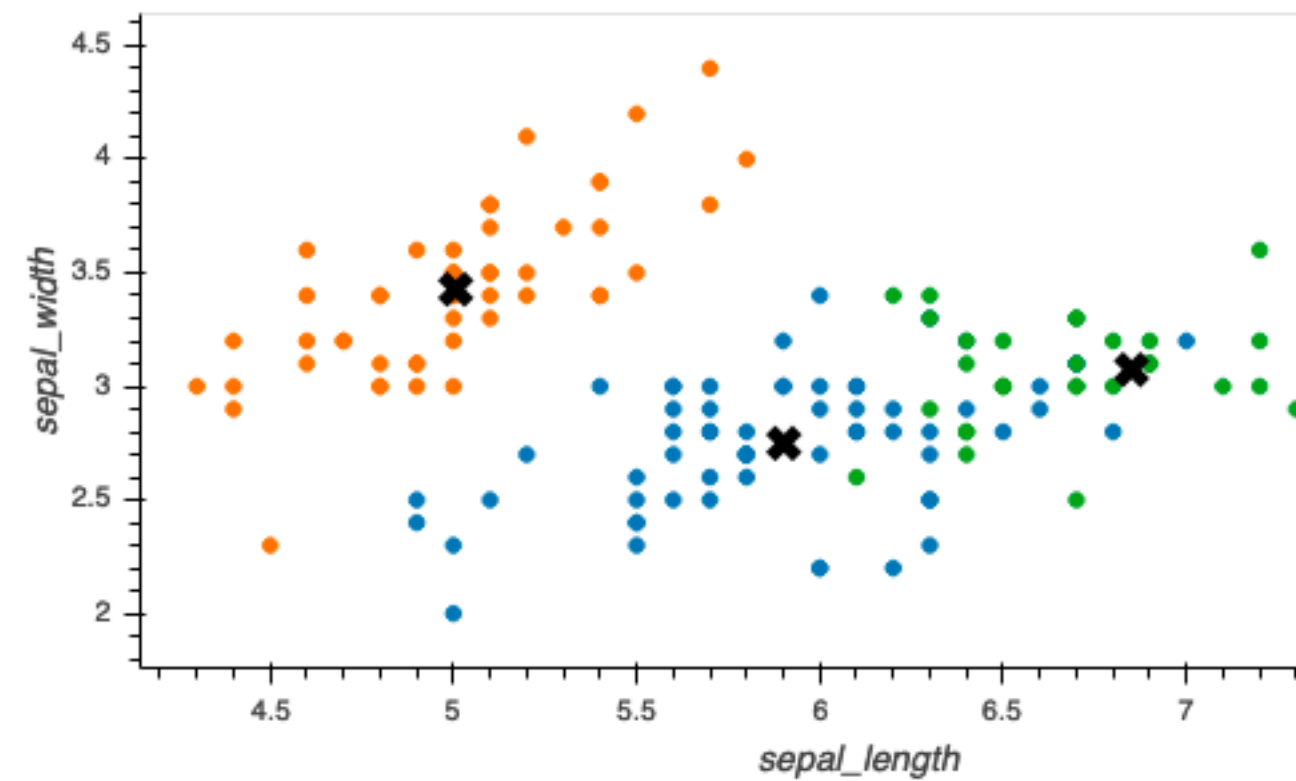
Panel & Voila - serve notebooks

Iris K-Means Clustering

x
sepal_length

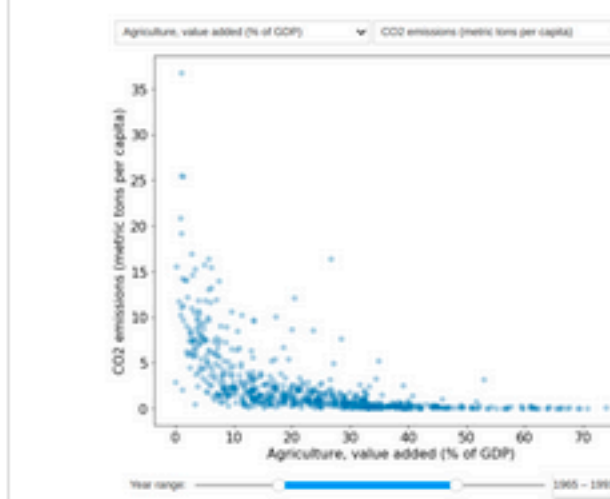
y
sepal_width

n_clusters: 3



panel.pyviz.org

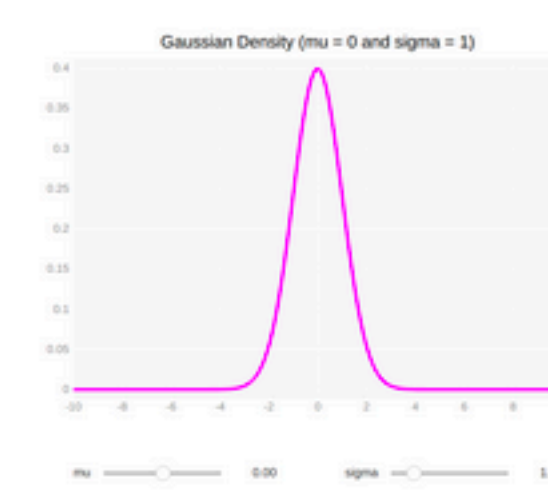
voila-gallery.org



country-indicators

Explore the correlations between indicators of development using matplotlib and ipywidgets

[Source](#)



gaussian-density

Explore the normal distribution interactively with bqplot

[Source](#)



render-stl

Explore STL files with ipyvolumes

[Source](#)

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Lab - let's make a pretty app

- `create.ml/odsc2019`
- open the notebook titled “Web app”

Resources & Credits

- <https://github.com/voila-dashboards/voila>
 - <https://voila-gallery.org/>
 - <https://vuetifyjs.com/en/components/api-explorer>
 - <https://github.com/mariobuikhuisen/ipyvuetify/>
 - <https://streamlit.io/>
 - <https://panel.pyviz.org/>
 - <https://altair-viz.github.io/>
 - <https://bokeh.org/>
 - <https://dash-gallery.plotly.host/Portal/>
- @jeremimucha | <https://create.ml>

Recap - benefits

- Knowledge sharing & preservation in the organization
- Building relationships between teams
- Getting internal buy-in
- POCs in hours
- Data people successfully going free solo and shipping tools
- Focus on core work - sharing is seamless

Share your work

- Pick your favorite framework and build an app!
- Tell the community what you built
- Let's stay in touch -> message me!
- Go to `create.ml/thankyou` and leave feedback :)