DeepLabCut:
a software package for animal pose estimation

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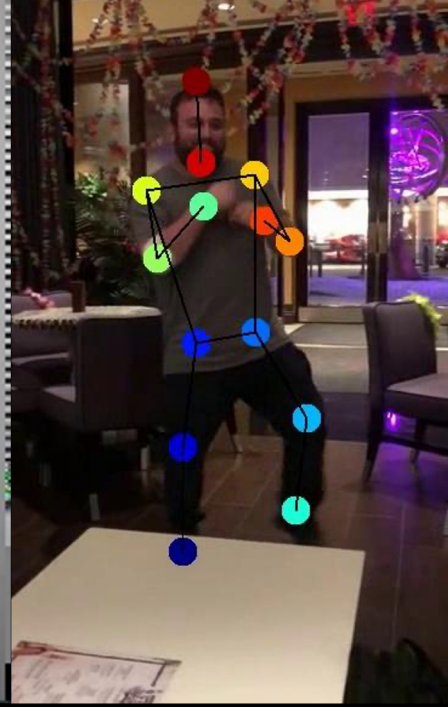
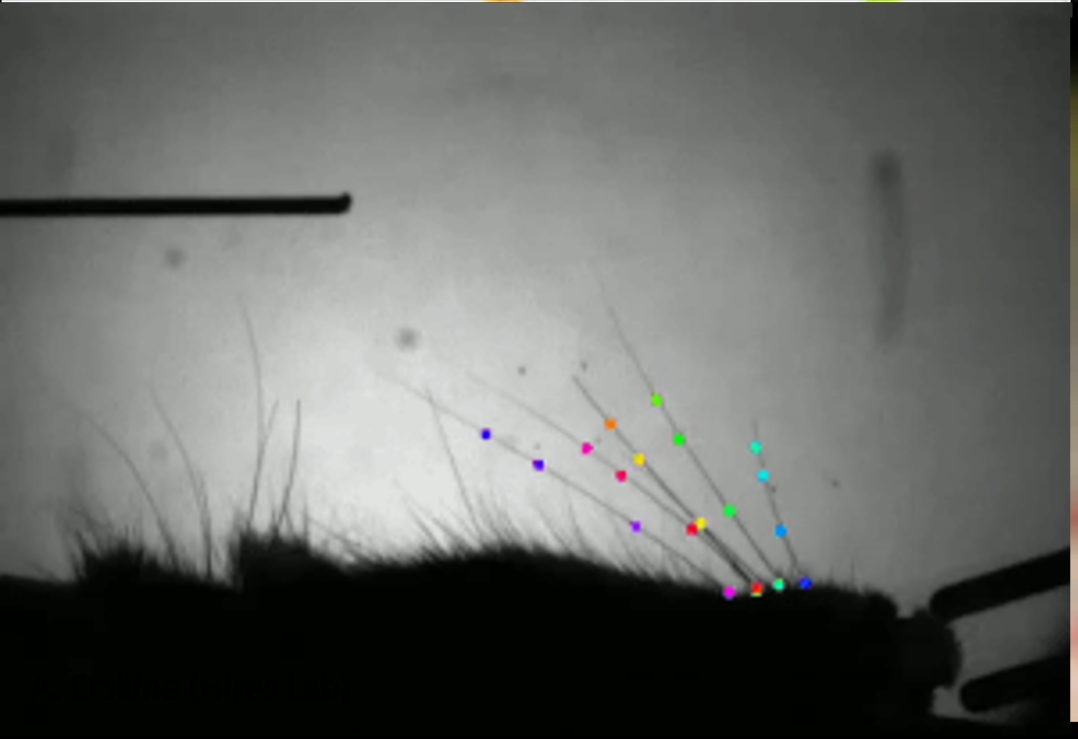
www.deeplabcut.org

Harvard University & EPFL | co-developers of DeepLabCut

@deeplabcut

@trackingactions

@trackingplumes

“DeepLabCut 2.0” – integration of annotation, training and inference

Networks build on ResNets (DeeperCut open source), MobileNetV2, EfficientNets

Create a project, extract frames, + GUIs to label your data

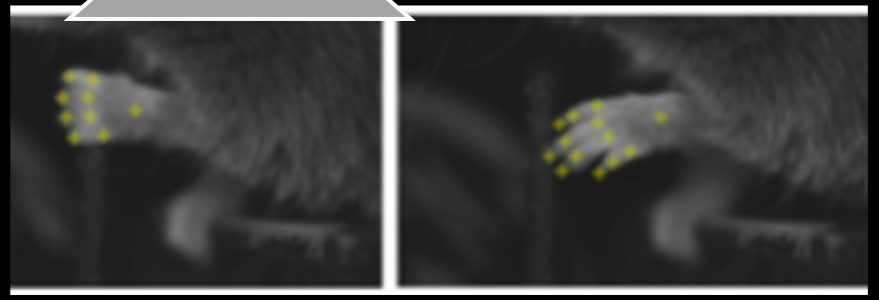
Select + Train your deep neural network

Evaluate network performance

(active learning + GUIs if improvement needed)

Run inference on new videos, create labeled videos, + plot your results!

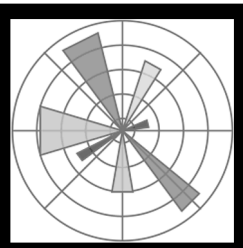
refine?



Mathis et al. Nature Neurosci, 2018
Nath* & Mathis* et al. Nature Protocols 2019

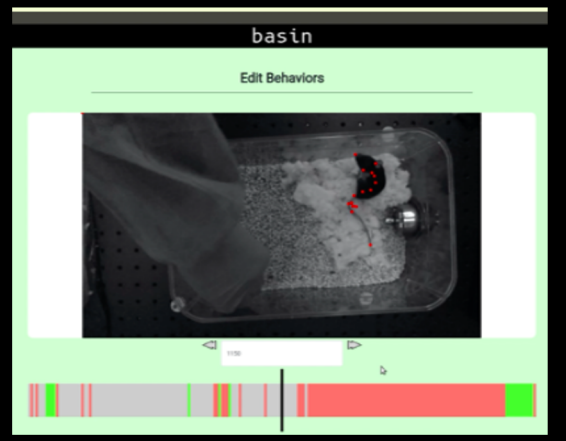
pandas

$y_{it} = \beta' x_{it} + \mu_i + \epsilon_{it}$



NumPy

TensorFlow



python

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Camera Control

KINEMATIK

DataJoint

Local CPU / GPU
university cluster/
...

colab

docker

aws

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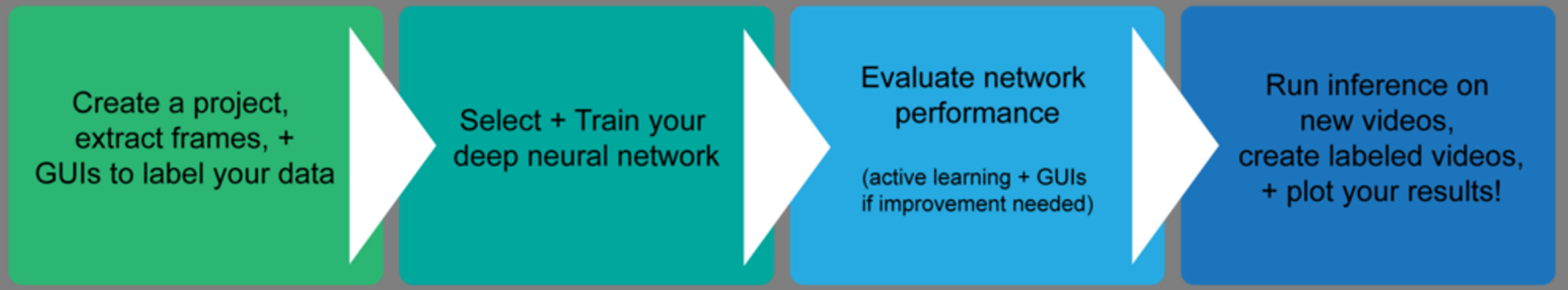
DLC GUI

use our Project Manager GUI, Jupyter Notebooks, Google Colab, or terminal!



- Flexible & modular code
- Code on GitHub
- Internal development periodically released (next: multi-animal, real-time)
- >500 forks (potential contributors)
- >30 contributors via GitHub
- > 3K installations per month

User experience:

- Projects (annotation data & network weights) can be shared
- Simple workflow with step-by-step user guide (Nature Protocols)
- Multiple ways to interact with the program (terminal, IDEs, Jupyter, GUIs)
- Example projects /data to play with code