# Pixi and Napari-Easy-Augment-Batch

## an agile approach for reproducible and repeatable deep learning

*A fast-moving toolkit for reproducible and repeatable deep learning*

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# Repeatable vs Reproducible software

1. Repeatable - Same software same data same results
2. Reproducible level 1 - different software, same data same conclusions
3. Reproducible level 2 - different software, different data, same conclusions

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# Pixi and Napari for repeatable and reproducible deep learning

- Pixi helps us get the same versions of dependencies all the time!
- Napari helps us run deep learning frameworks and test if they are reproducible between each other

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# Goals

1. Show how to use Pixi to start a Napari plugin with different deep learning frameworks.
2. Use Napari Layers to compare results from the different frameworks. Are they reproducible?

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# Disclaimer

- I am not an expert in Pixi
- Pixi has power-law productivity
- Early knowledge yields large productivity benefit

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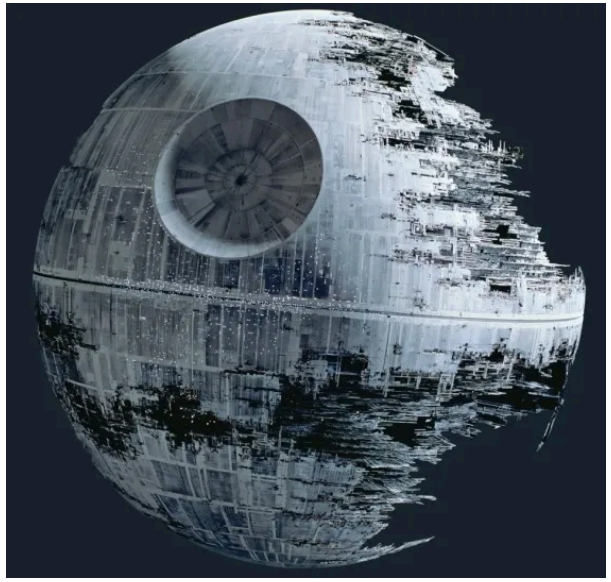
# Disclaimer

- Under Construction



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## The Project: napari-easy-augment-batch-dl

- A plugin for **napari** to augment data and apply deep learning segmentation
- Wraps multiple deep learning frameworks including **Cellpose** and **MicroSAM**
- **Combine multiple deep-learning toolkits in the same workflow**
- Advanced options are **very configurable** for special cases
- Designed for rapid experimentation:
  - Add new augmentations quickly
  - Test less commonly used options

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## Agile by Design

- We make changes **very fast**
- Small user base = **less risk of breaking** existing workflows
- Contrast:
  - **Cellpose GUI** & **QuPath** → large user bases (thousands), stable APIs
  - Move slower, break less
- napari-easy-augment-batch-dl → perfect for trying **special options fast**

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## Why Agile Matters Here

✅ Quick iterations on new augmentation ideas

✅ Feedback loops directly with early users

✅ Can integrate new segmentation toolkits or new versions of existing toolkits ASAR (As soon as Released)

✅ Can respond to specific research needs without delay

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# Big Tools vs. Niche Tools

**Cellpose GUI / QuPath:**

- Work great ~80% of the time
- Large communities, stability first

**napari-easy-augment-batch-dl:**

- Niche, but powerful for the last 20%
- When you need an obtuse setting or option it can be ready in hours.
- Experimental features can be 'released' immediately

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## Pixi as the Perfect Partner

- **Pixi** sets up consistent environments quickly
  - fine grained control over exact version of dependency toolkits
- You can even pin to a **specific commit** of napari-easy-augment-batch-dl
- Ideal for agile workflows:
  - Test a commit
  - Roll back

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## Example Workflow

1. Navigate to folder with 'pixi.toml'
2. Navigate to prefonfigured pixi project
3. `pixi run startup`

## Preconfigured Pixi projects

1. Napari-easy-augment-batch + Stardist
2. Napari-easy-augment-batch + Cellpose/Microsam

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## When to Choose napari-easy-augment-batch-dl

- ✅ Need special augmentation options
- ✅ Willing to try cutting-edge features
- ✅ Don’t mind quick changes and updates
- ✅ Already using **Cellpose** or **MicroSAM** and want to push them further

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## Questions?

💬 Let's talk about Pixi, agile workflows, and how to get the most from **napari-easy-augment-batch-dl**!

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