

Zero-code tools & BMZ Community partners workshop, Madrid
10/06/2024



Web & Cloud-Based Platforms for AI-powered BioImage Analysis

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A world-leading Swedish national center for large-scale research and innovation in life sciences



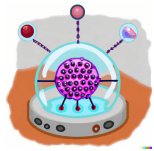
Research environment
Approx. 190 affiliated
research groups



Infrastructure
Service to ~ 1400 Swedish researchers
annually (2020)



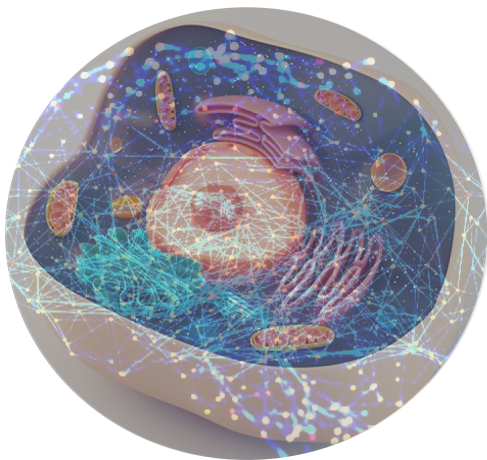
Data-driven life science
3.1 billion SEK, 12-year-program
DDLS Fellows Program



AICell Lab (<https://aicell.io>)

Building AI Systems for Data-driven Cell and Molecular Biology

Data-driven Human Cell Simulator

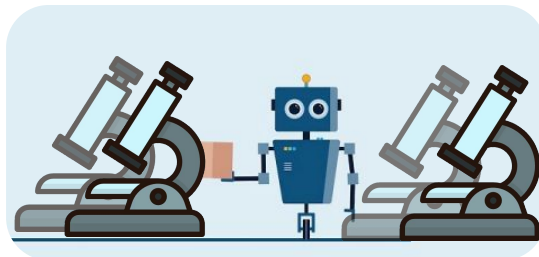


AI: Data- & Compute-hungry!

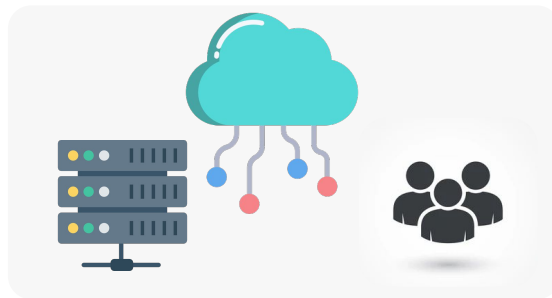
**Data
Generation**

**AI Models
Execution**

Microscopy Imaging Farm



AI Cloud Infrastructure





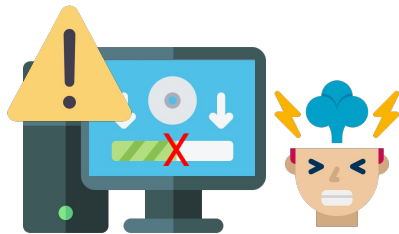
Desktop Software



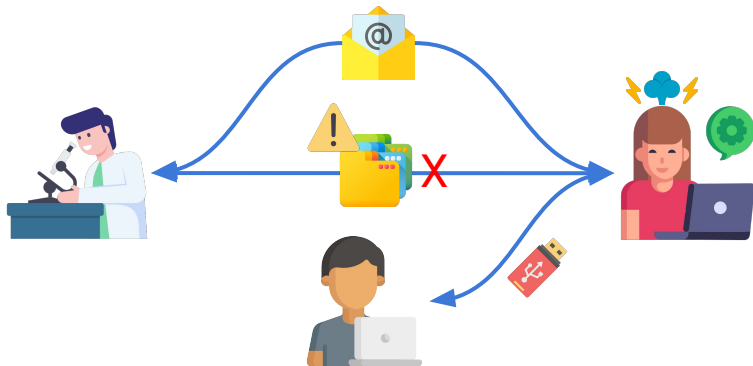
Web & Cloud Application



Storage & Compute
Capacity Determined
Locally

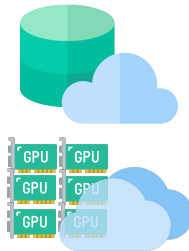


Challenging Installation

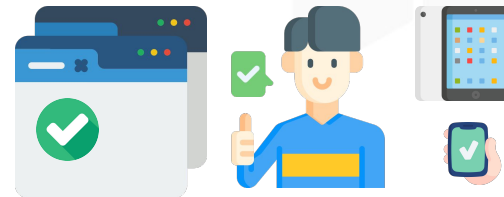


Significant Collaboration Barriers

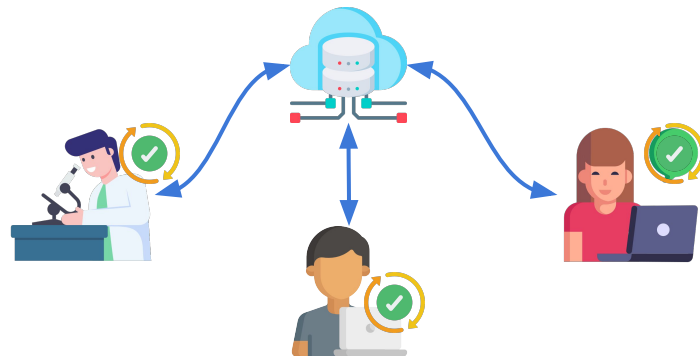
Image credit: Flaticon.com



Storage & Compute Pull
From Globally Available
Resources



Zero-Installation
with mobile support

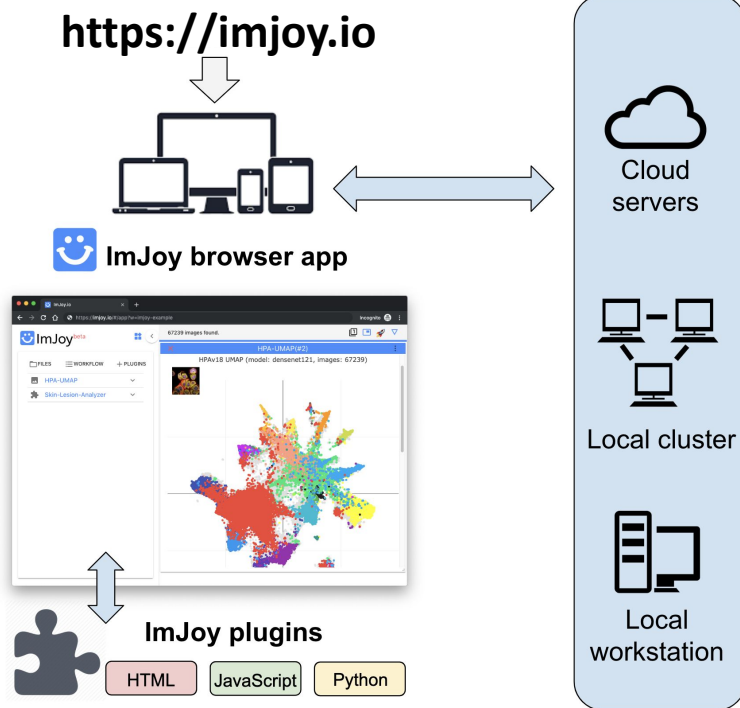


Streamlined Collaboration

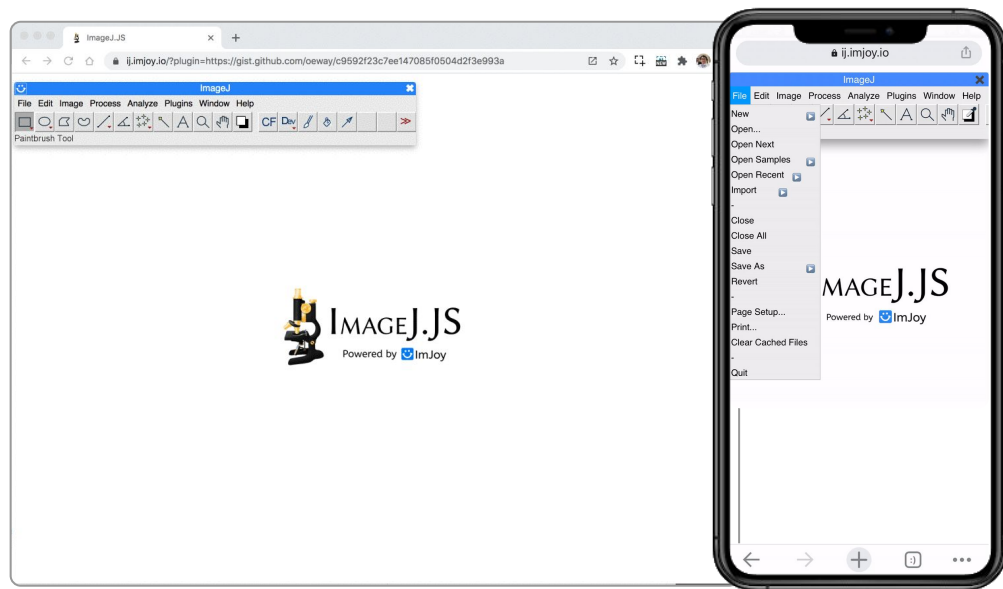
ImJoy AI computing platform

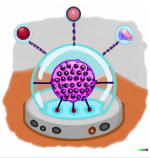
Supercharging interactivity and scalability in AI-powered life science

 Plugin Engine

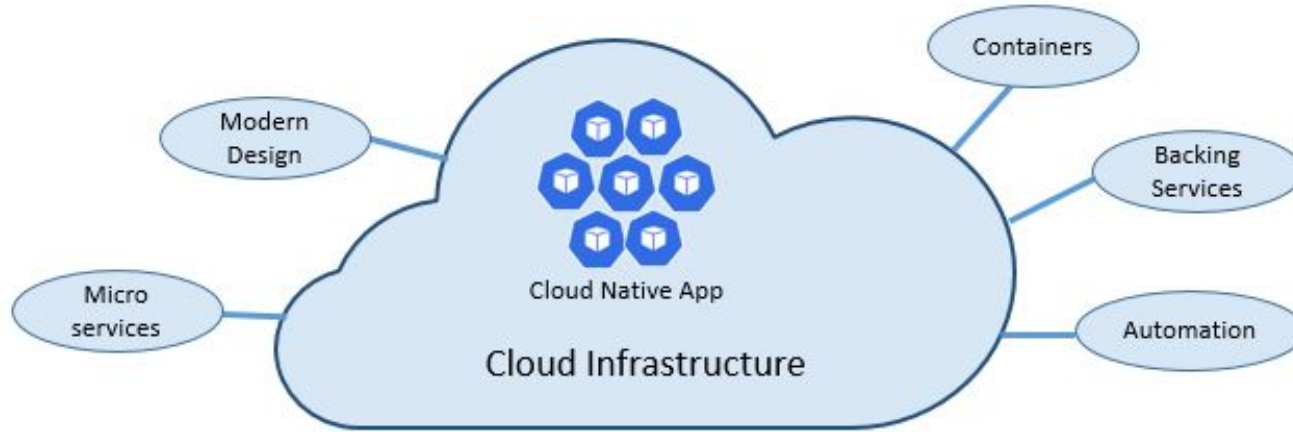


ImageJ.JS: ~1000 users / day





Web & Cloud Application for Bioimaging

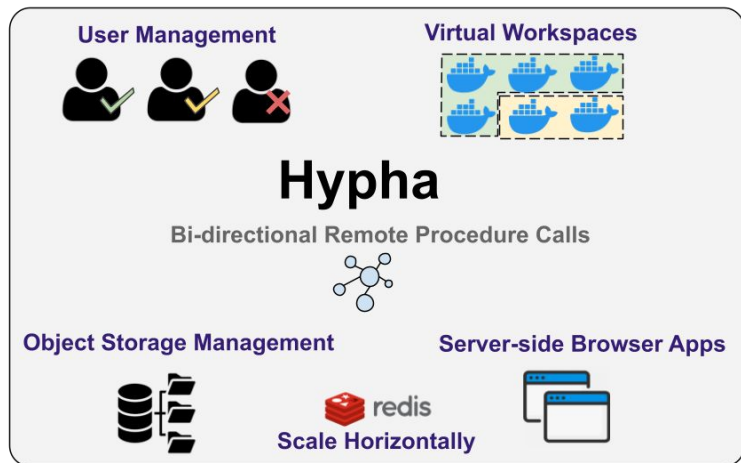


- Handle data and computation in the cloud
- Desktop software and browser as a interface

Multicloud: private, public, hybrid => **cloud of clouds**

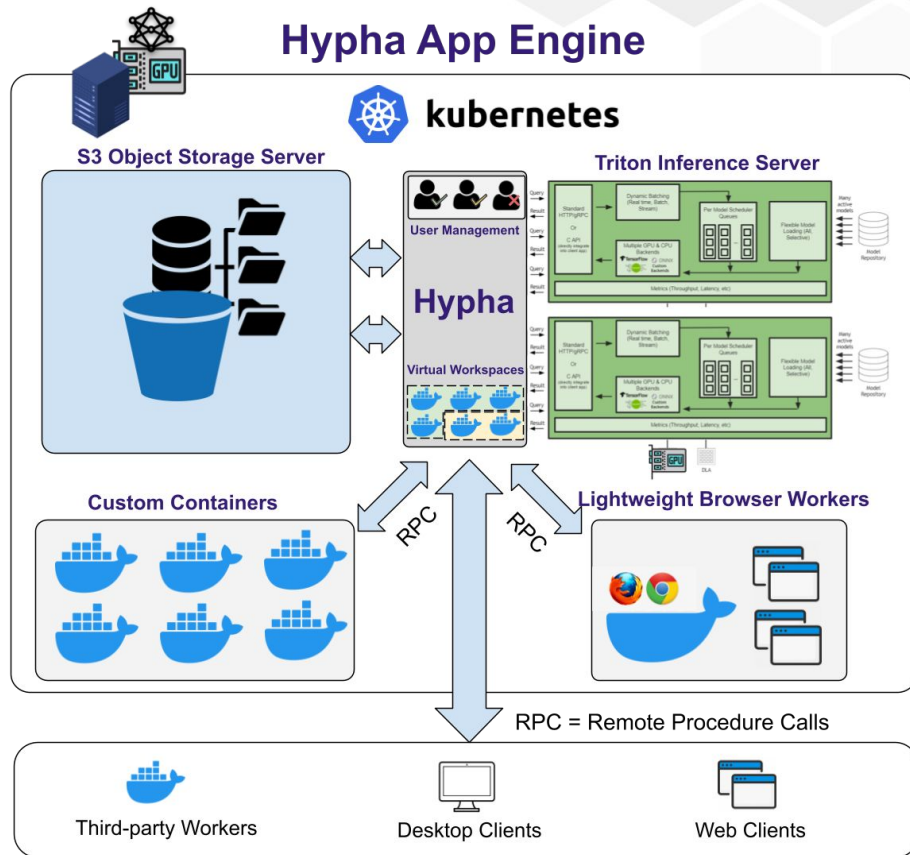
Hypha for Data & AI in the Cloud

A Python package for Scalable Data Management
and AI Model Serving



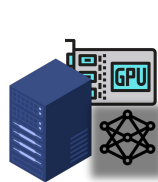
Freely available here:

<https://github.com/amun-ai/hypha>





- Model description file standard
- Repository for sharing models
- Continuous integration for model testing

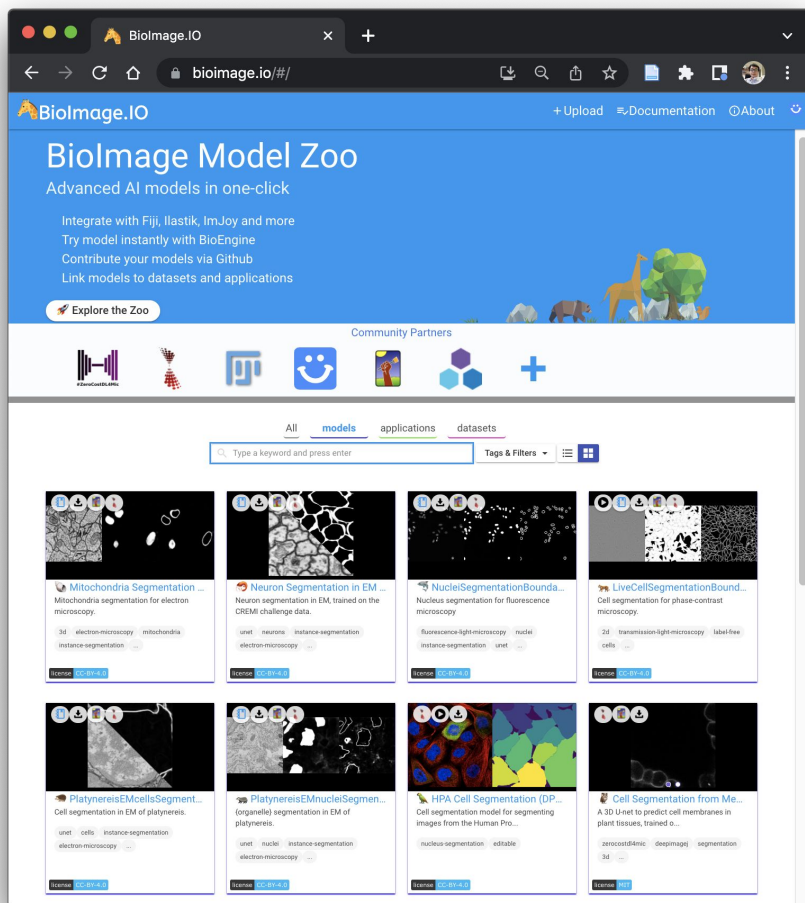


BioEngine
model serving and test run
Powered by Hypha App Engine

Preprint for the Biolmage Model Zoo

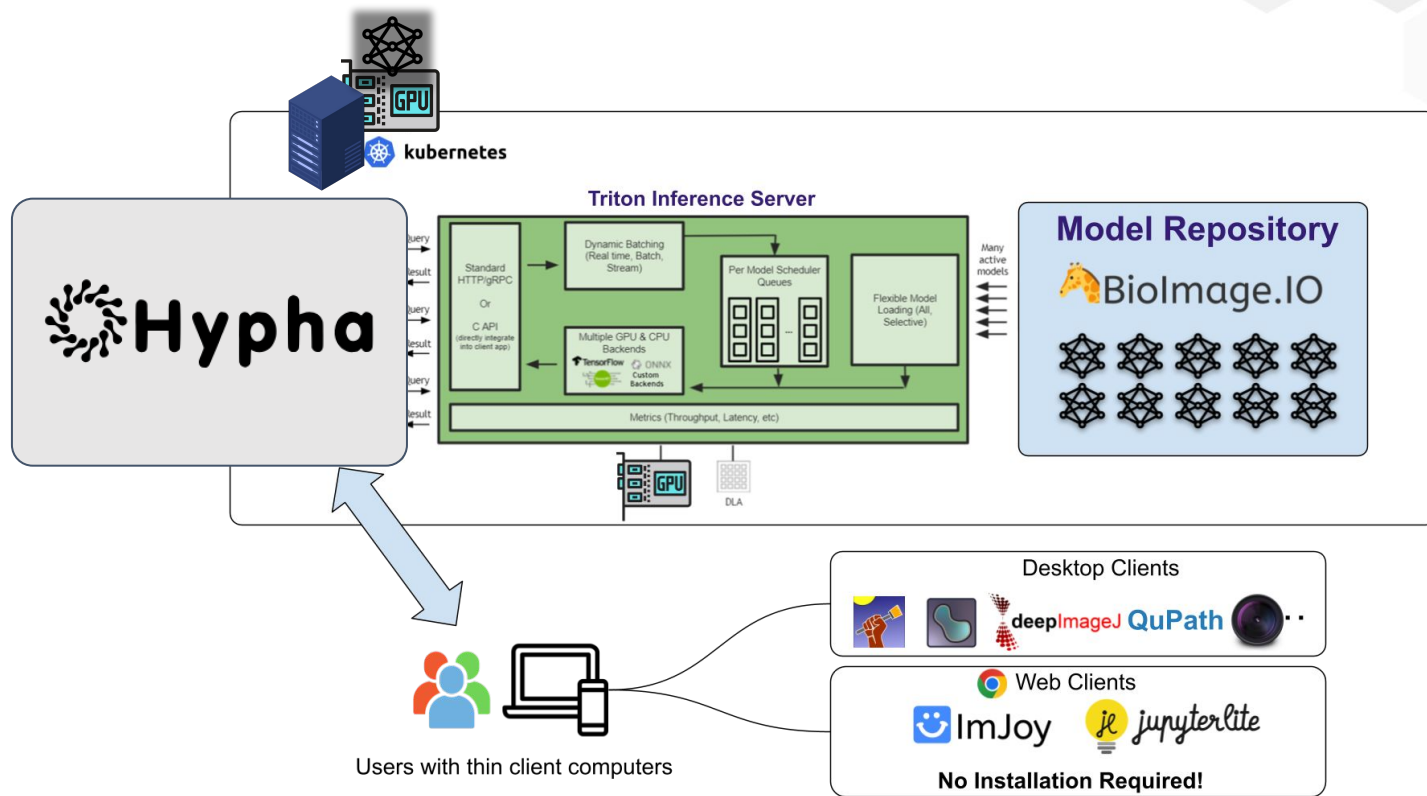
<https://doi.org/10.1101/2022.06.07.495102>

<https://bioimage.io>



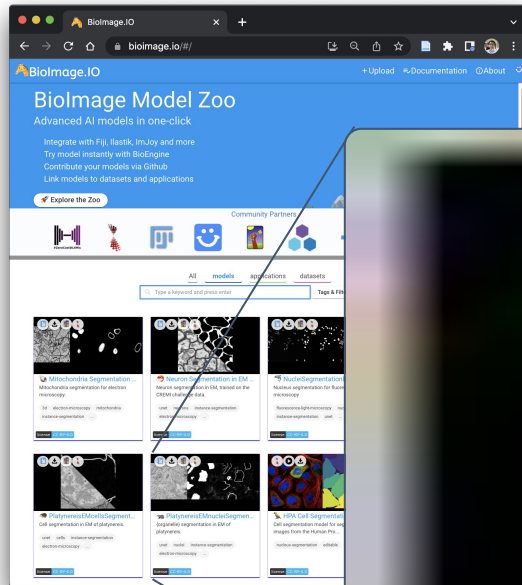
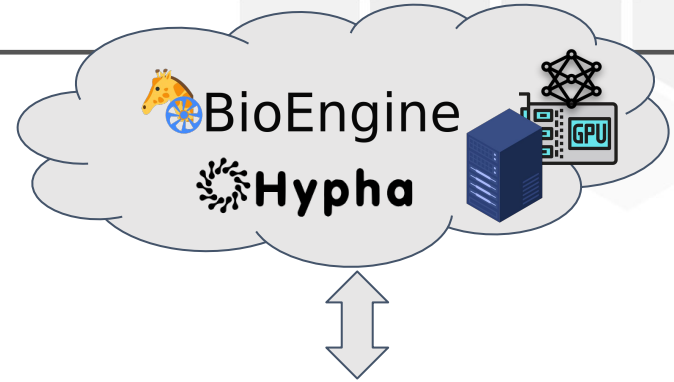


BioEngine - AI models for BioImage Analysis



Test Run AI Models in the browser

Try it yourself: <https://bioimage.io>

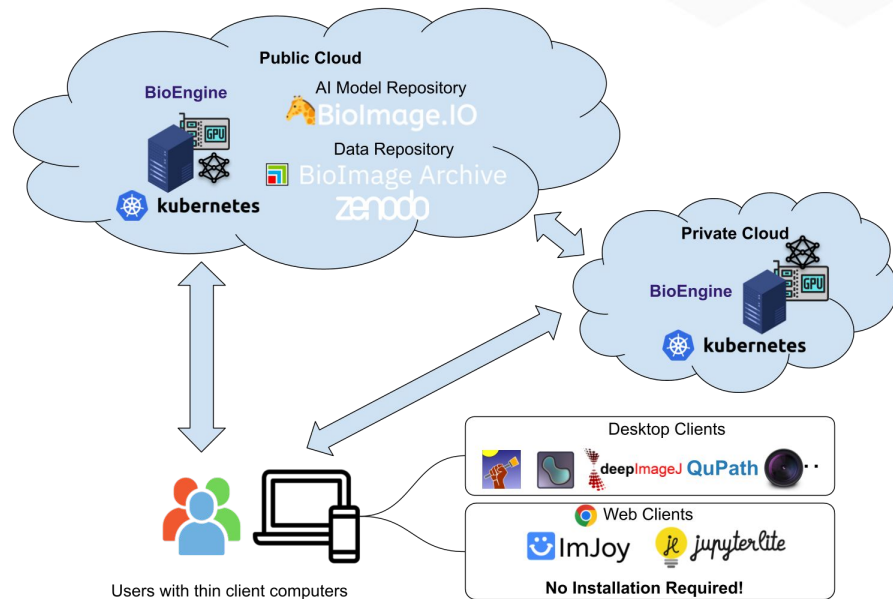


Deploy Your Own 🦒⚙️ BioEngine

🦒⚙️ BioEngine for Desktop



🦒⚙️ BioEngine for Kubernetes & HPC

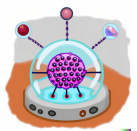


Stay tuned!

Hands on: Accessing BioEngine in Jupyter notebooks

- Start Chrome
- Create an **Incognito** window, via the `...` menu in Chrome
- Start the following jupyter notebook:
<https://imjoy-notebook.netlify.app/lab/index.html?load=https://raw.githubusercontent.com/bioimage-io/bioengine/main/notebooks/bioengine-tutorial-embl-2024.ipynb&open=1>

Acknowledgements



AICell Lab



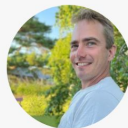
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Joanna Hård

Postdoc Researcher



Linh Duong

Researcher



Nils Mechtel

PhD Student



Songtao Cheng

PhD Student



Wei Ouyang

Principle Investigator



Weize Xu

Visiting PhD



Yanhong Su

Postdoc Researcher



We are recruiting PhDs and Postdocs!

AICell Lab Website: <https://aicell.io>



AI4Life



SciLifeLab

*Knut and Alice
Wallenberg
Foundation*



A Future of Collaborative Biolmaging

