



Open-Source Software for the Age of Medical AI

Julien Jomier | ICCR 2024

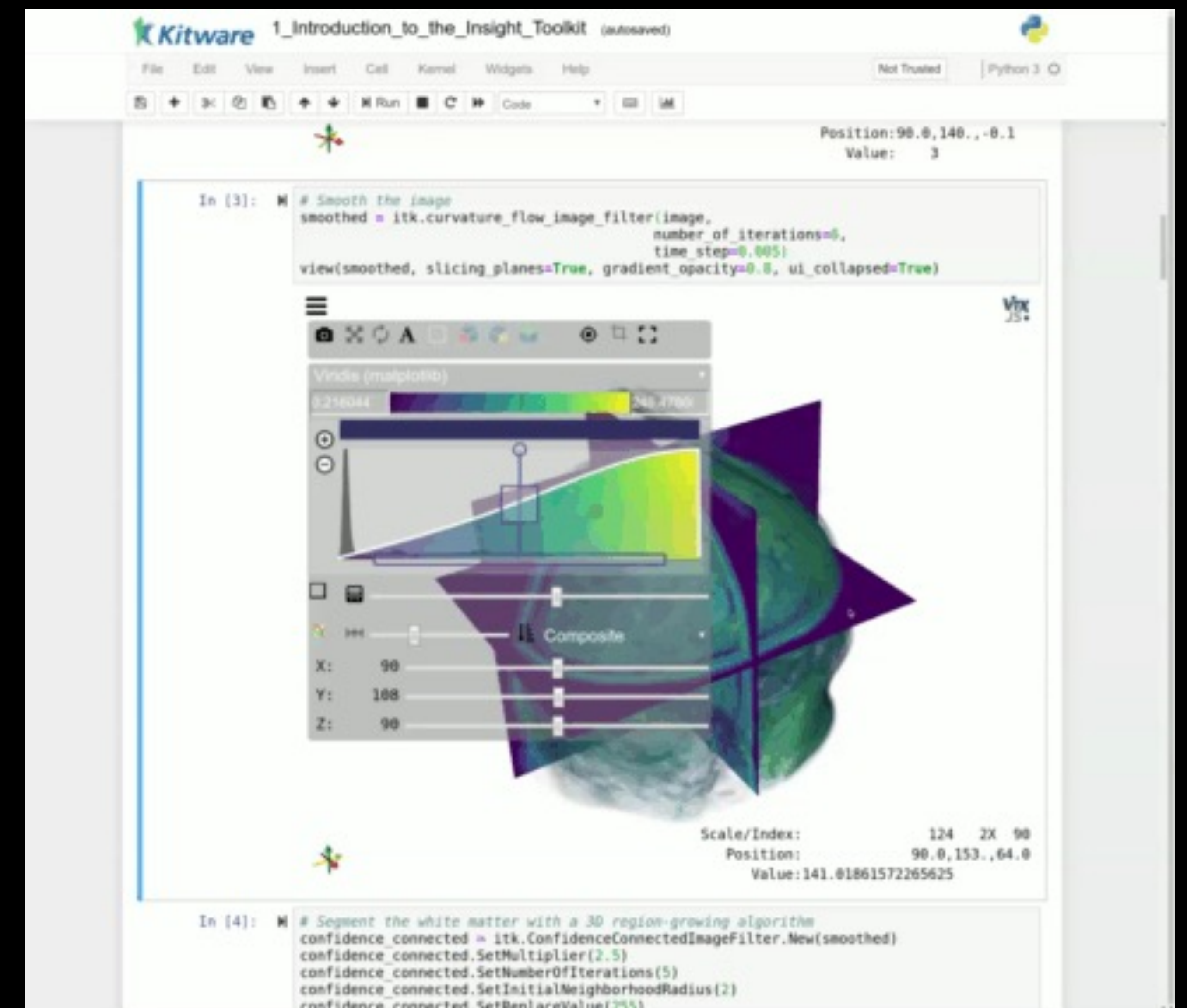
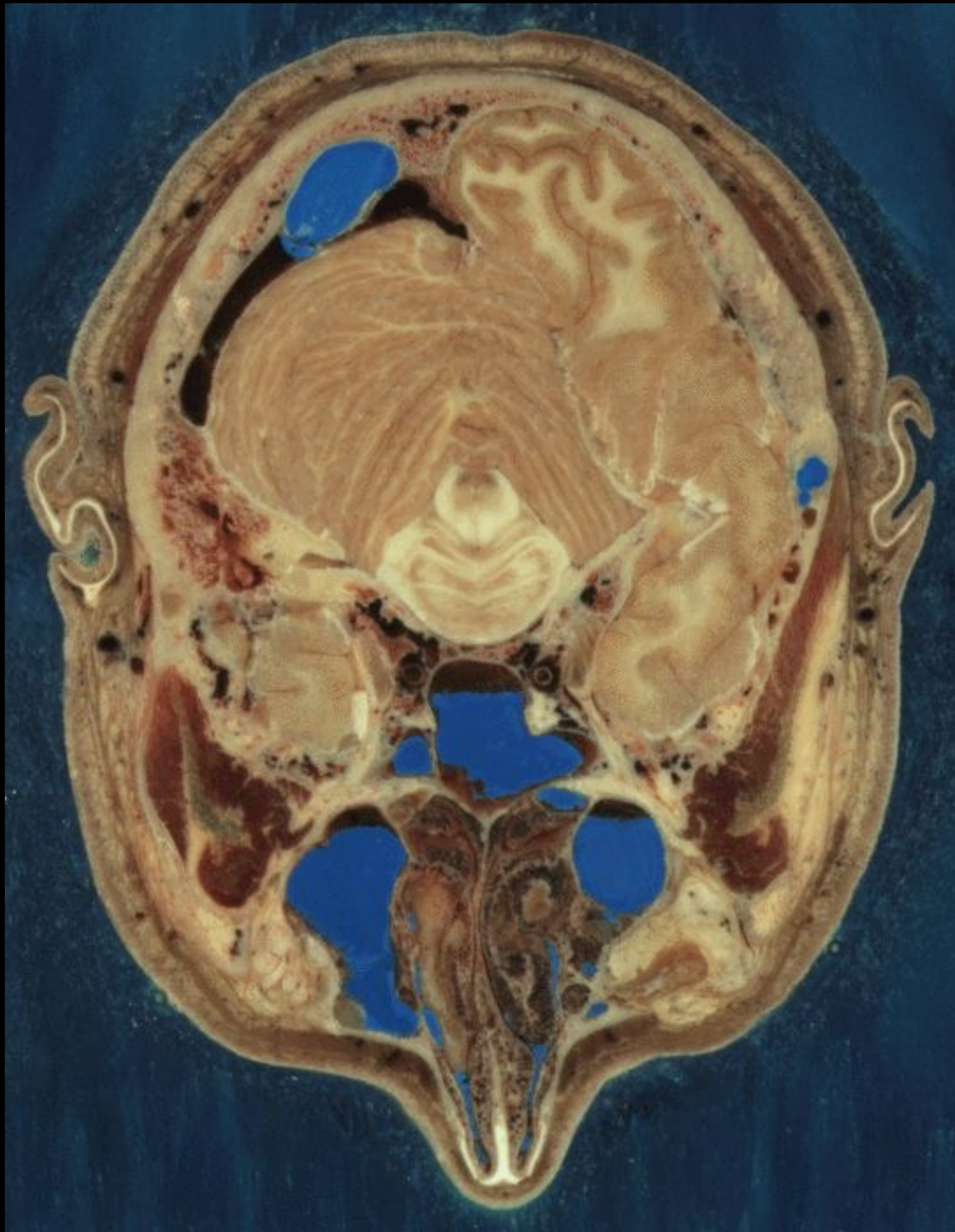


The Insight Toolkit

Segmentation and Registration Toolkit



- First release in 2001
- Apache 2 license
- www.itk.org

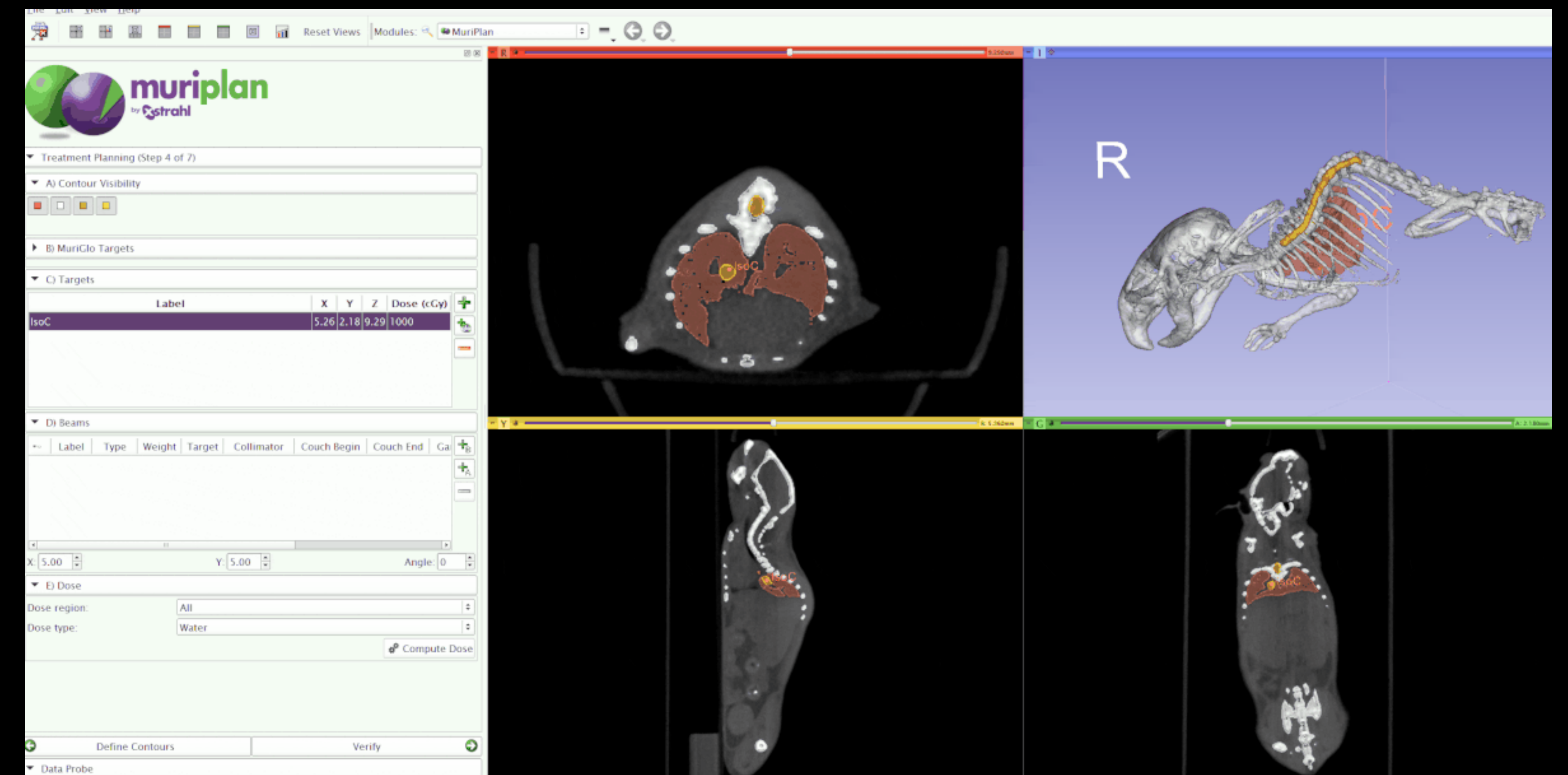
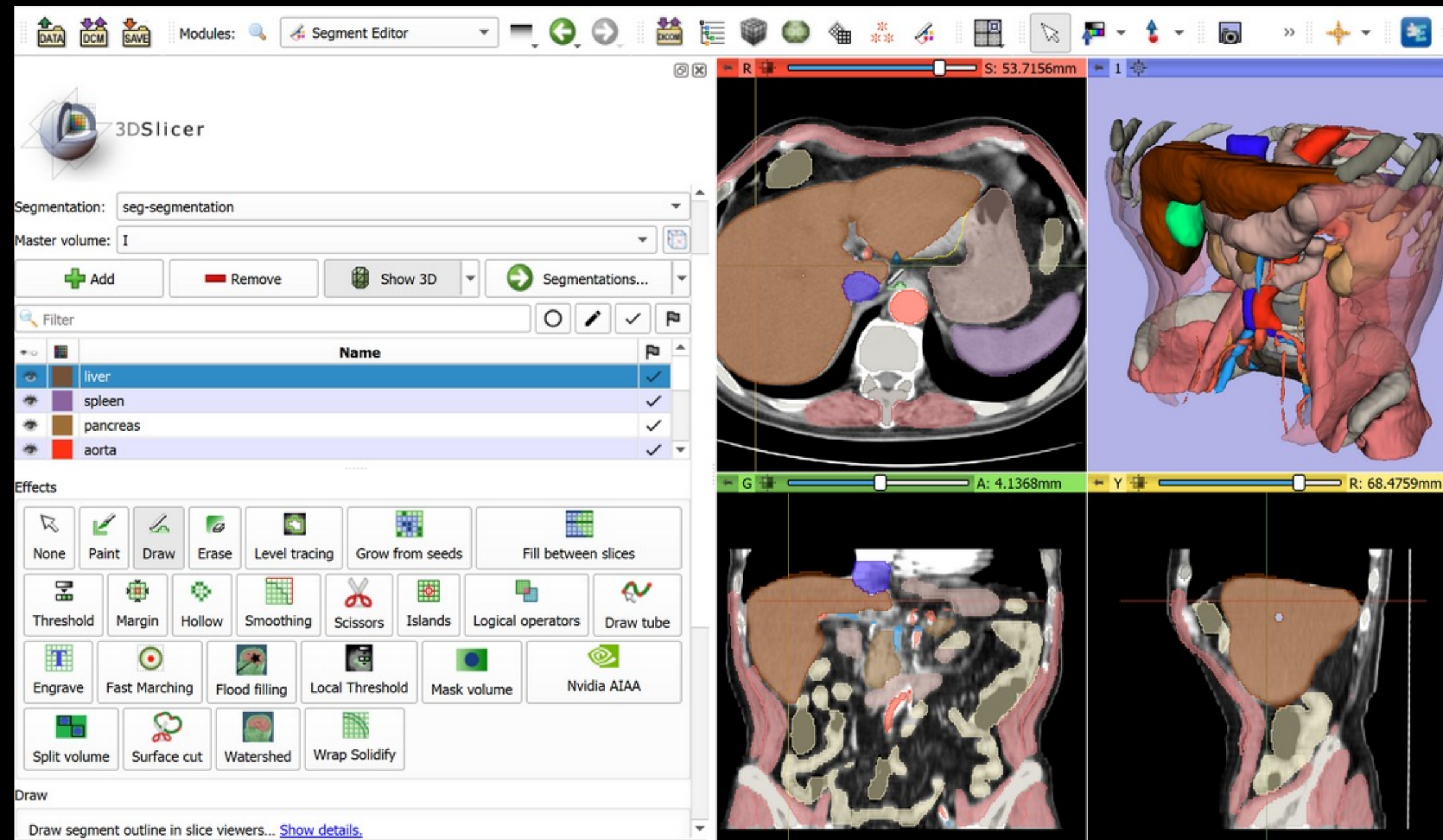


3D Slicer

Development Platform for Medical Solutions



- Slicer3 released in 2007
- Apache 2 license
- www.slicer.org
- 1M+ downloads

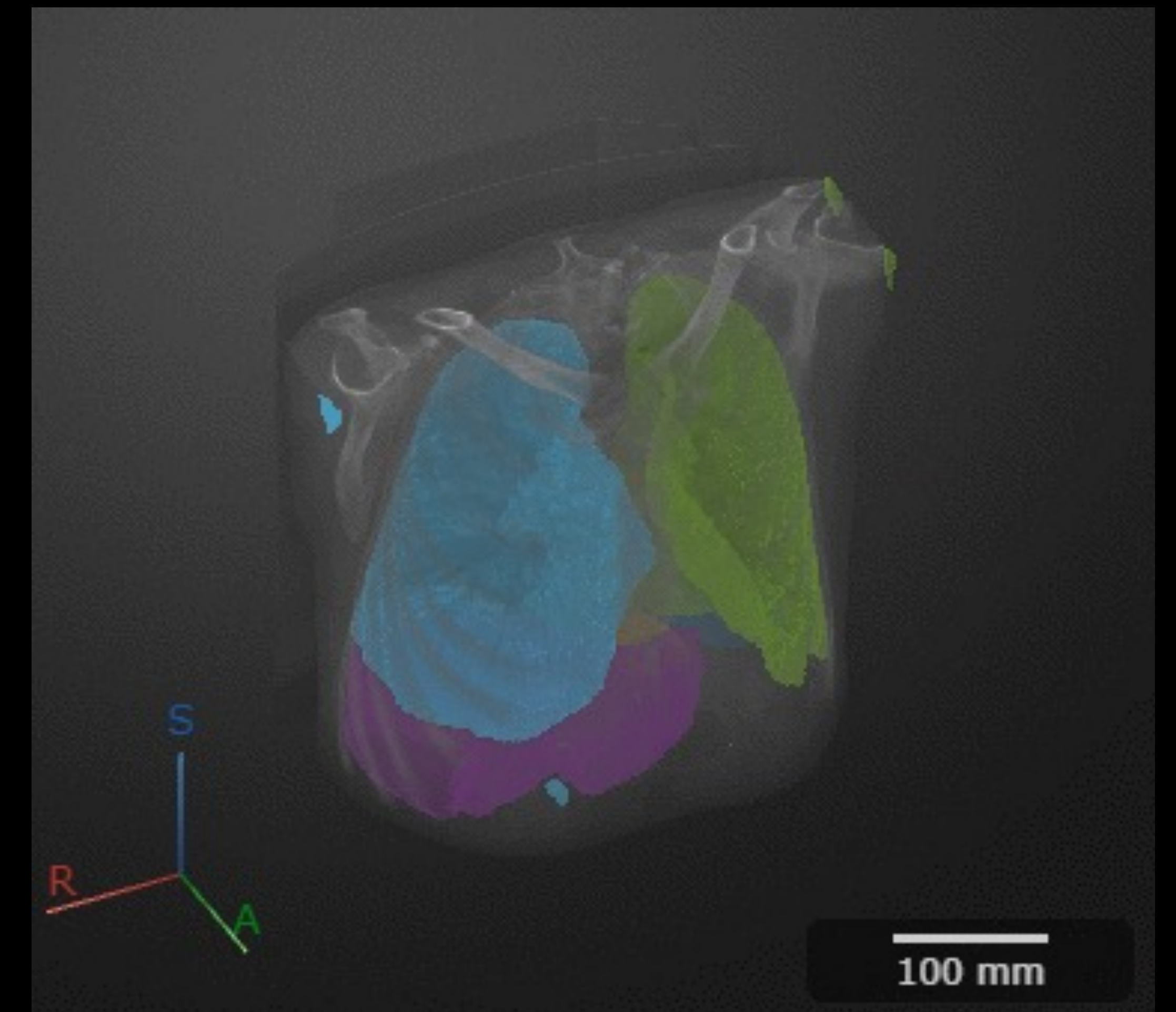
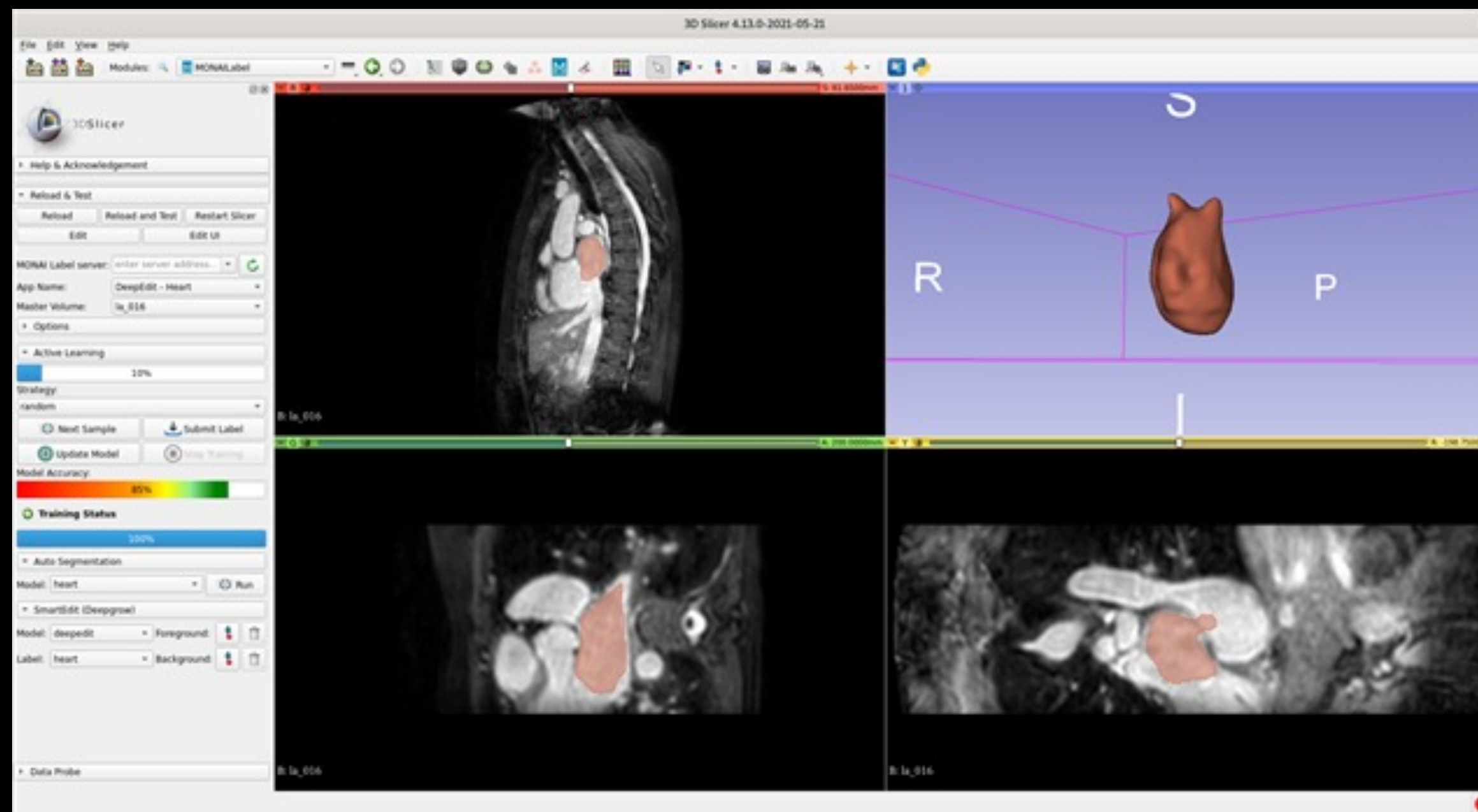
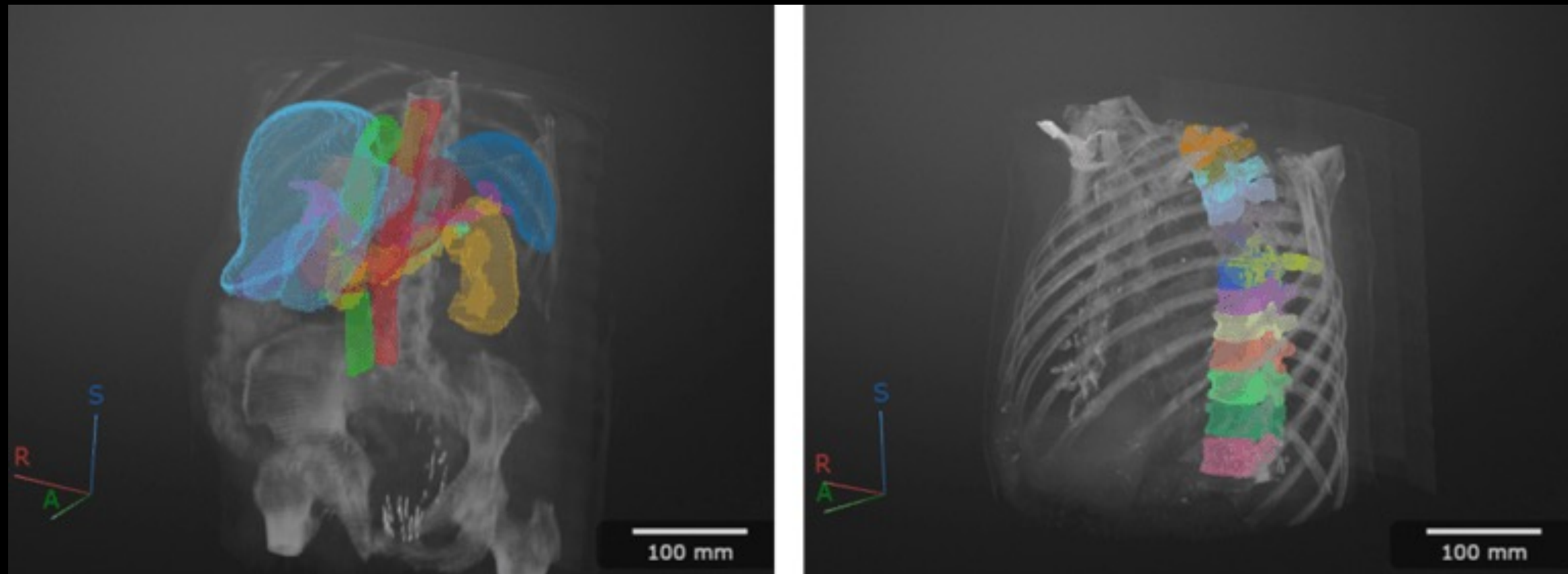


MONAI

Medical Open Network for AI



- Initial release in 2021
- Apache 2 license
- www.monai.io
- 1.5M+ downloads

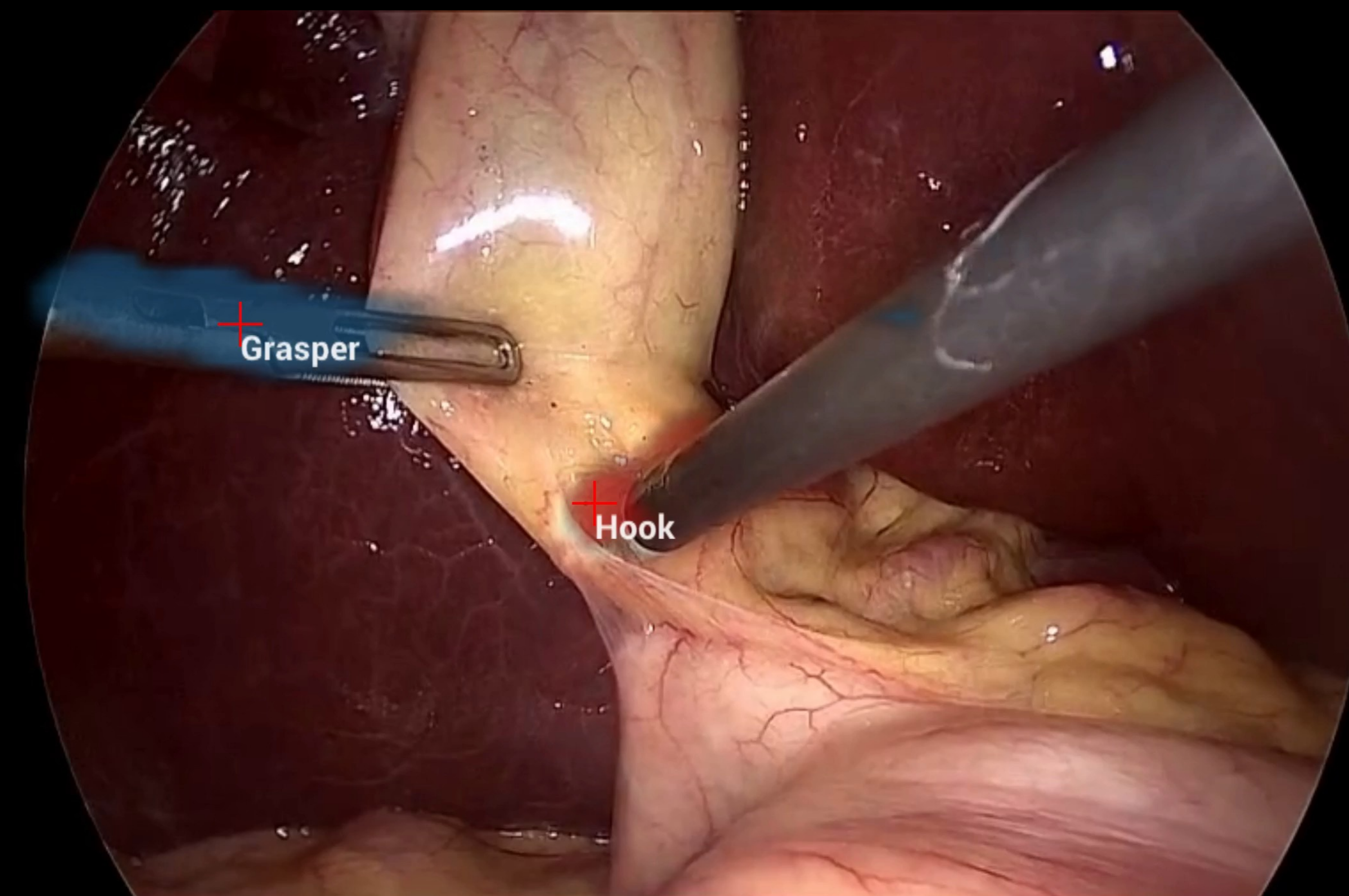


HOLOSCAN

Real-time sensor streaming AI



- 1.0 release in 2024
- Apache 2 license
- <https://www.nvidia.com/clara/holoscan>

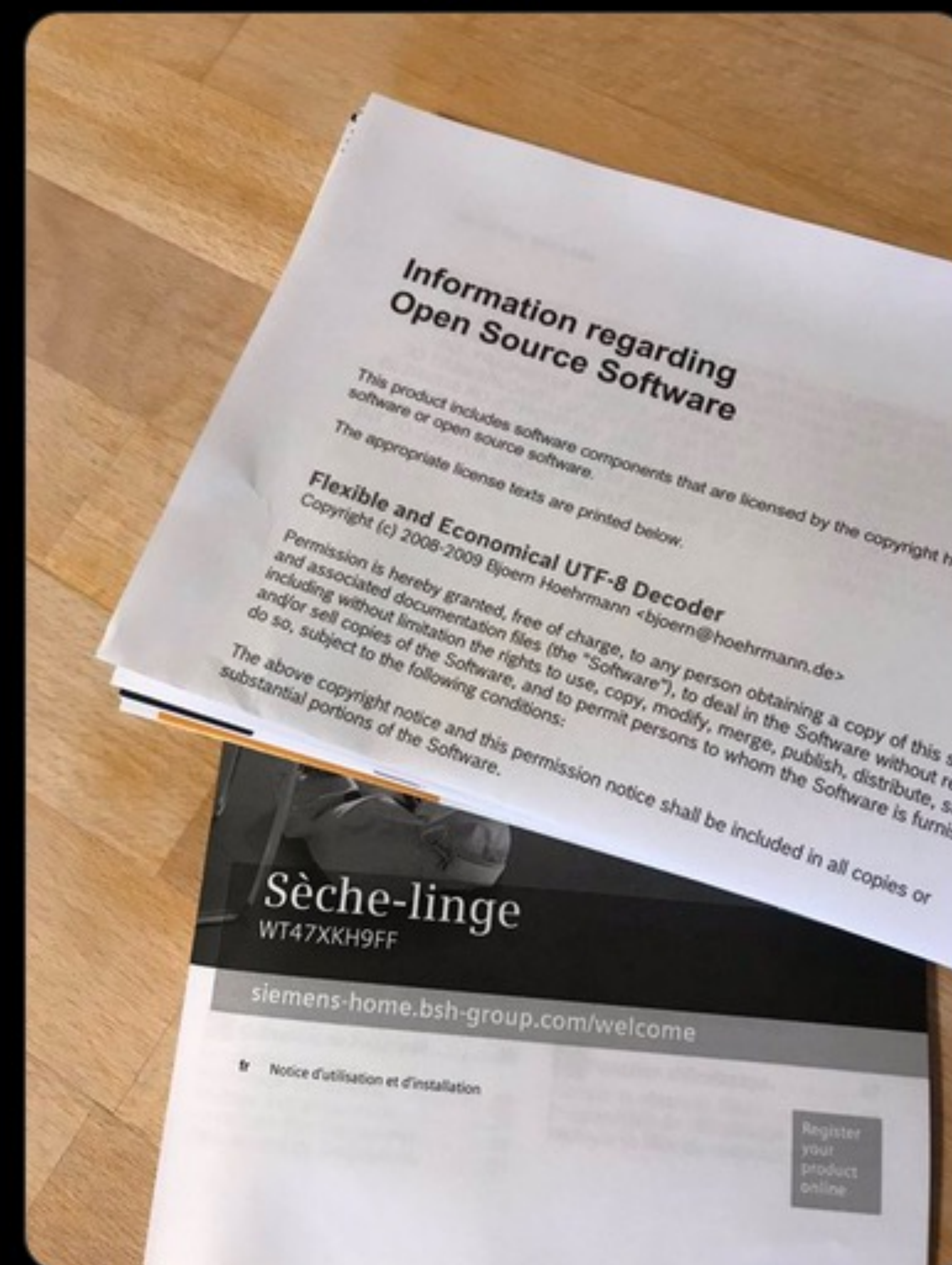


Open-Source is a commodity



Julien Jomier @julianou · Feb 15, 2020

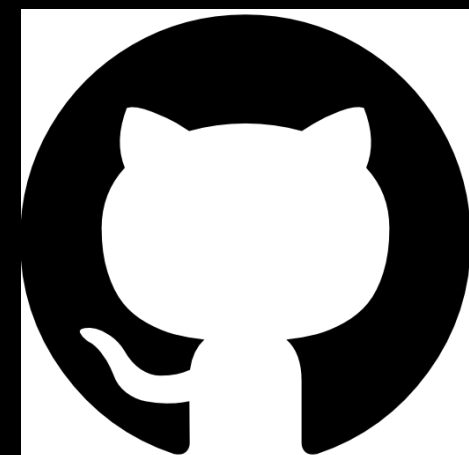
New washing machine came with the appropriate information. And no I didn't get it just for that 😊 #opensource



Open-Source Development Tools

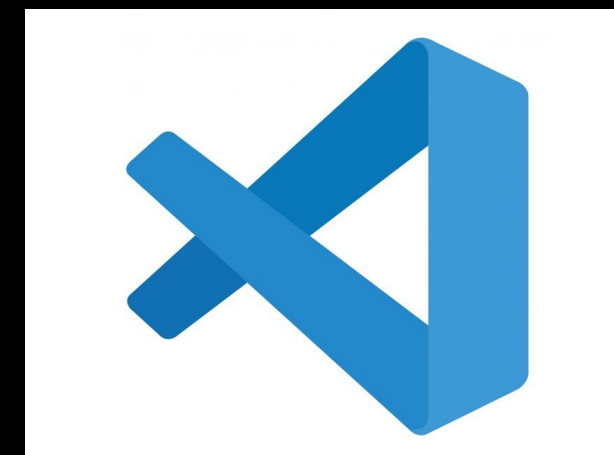
Hosting

- Gitlab
- Github



Editing

- Eclipse
- VS Code



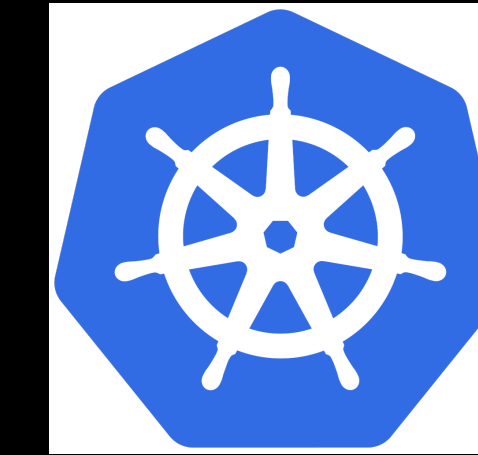
Building

- CMake
- Bazel



Deploying

- Containers
- Kubernetes



Testing

- Jenkins
- CircleCI



Replicating Open-Source Software for AI

A good idea?

- OSS licenses are **complex**
- AI is **not all about software**
 - **Mathematical algorithms** : not IP protected
 - **Data** : copyrightability, fair use, ownership, privacy compliance
- **Open-Source fundamentals**
 - **Use** the system for any purpose and without having to ask for permission
 - **Study** how the system works and inspect its components
 - **Modify** the system for any purpose, including to change its output
 - **Share** the system for others to use with or without modification, for any purpose



OSS vs OS AI

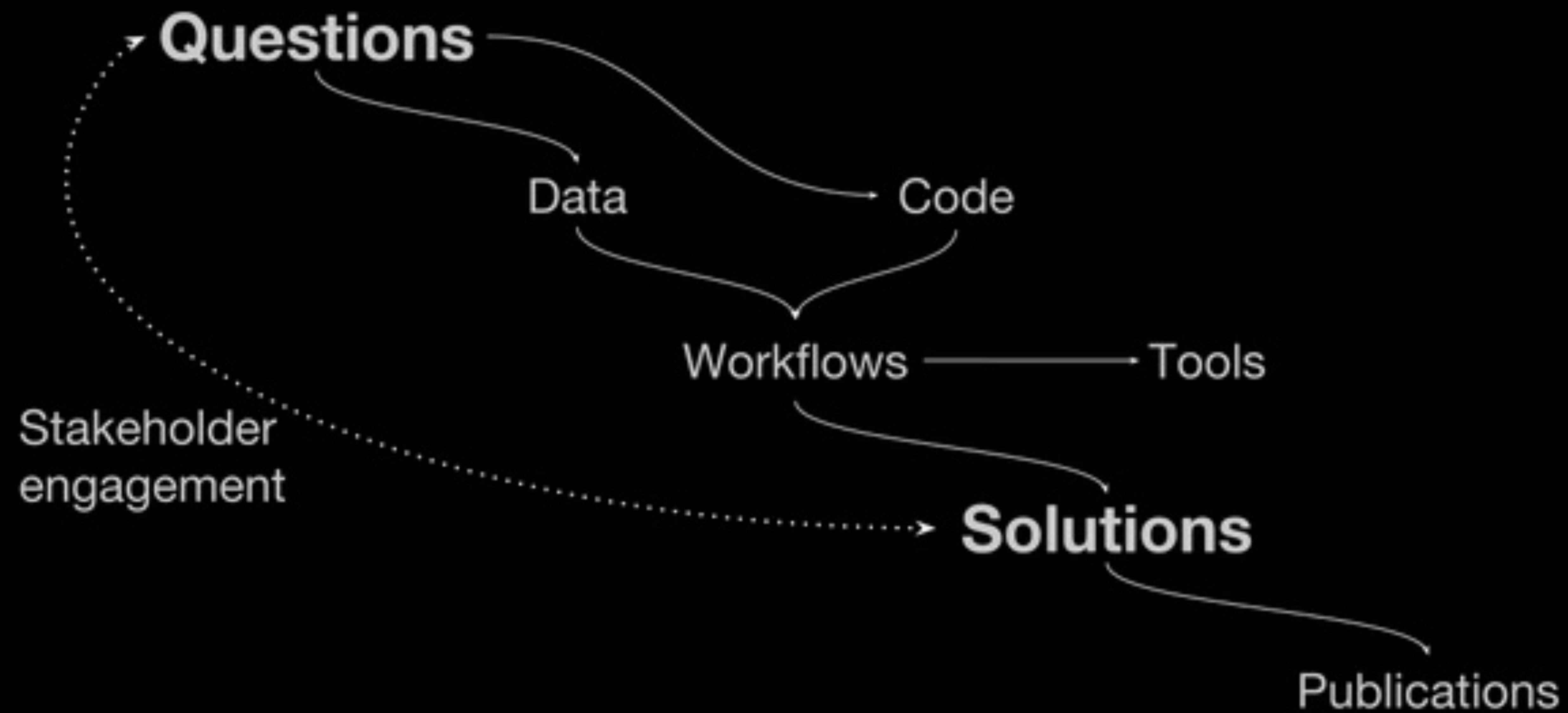
- OS AI **needs access** to:
 - Training Data
 - Code and libraries
 - Model
- “for any purpose” vs “**behavioral use restriction**”
 - Responsible AI License (RAIL)
- Licensing for OS AI is **not enough**
 - Trust and transparency
 - Governance
 - Standardization
 - Regulation



Open Science

It is not only about source code

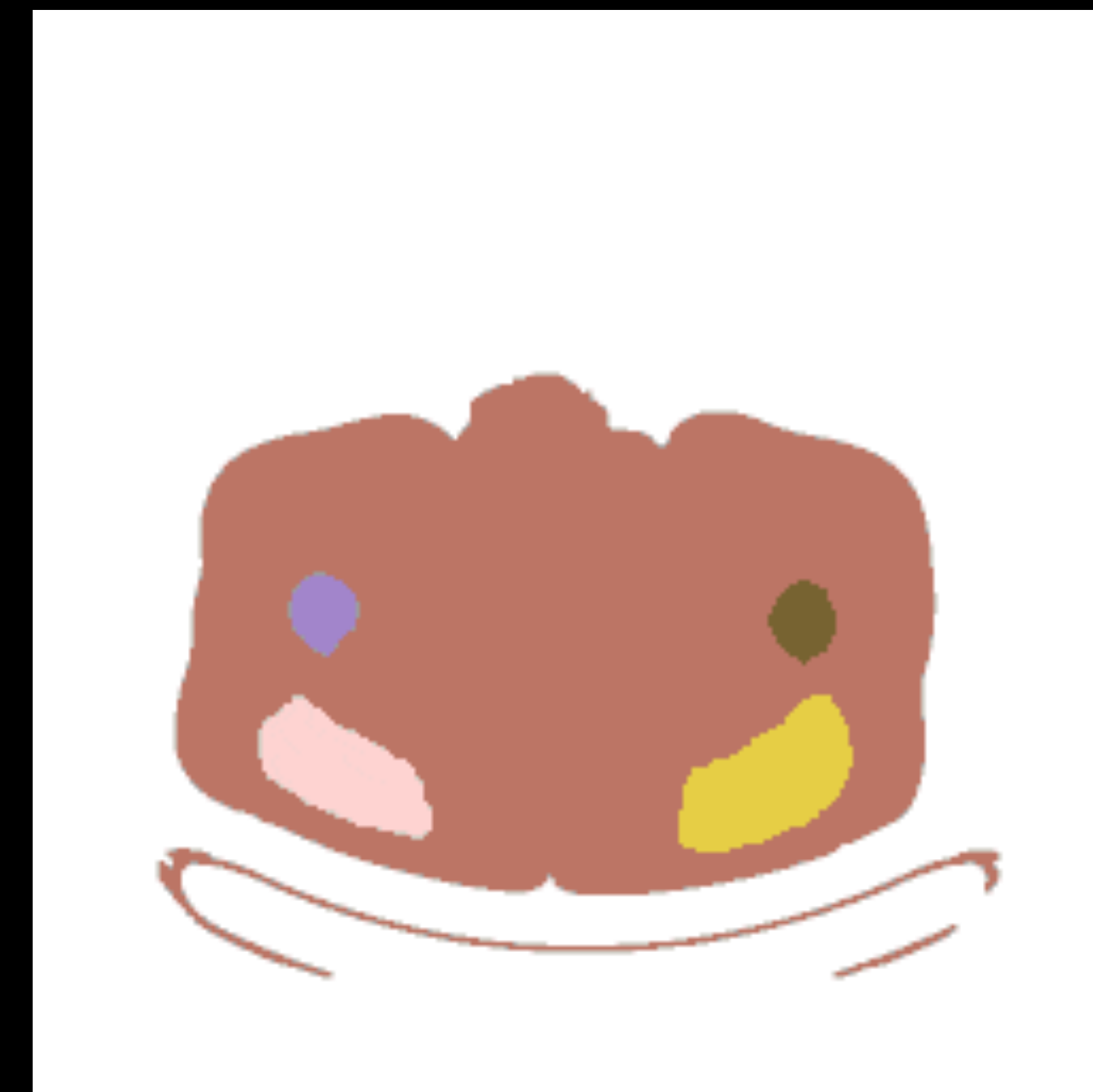
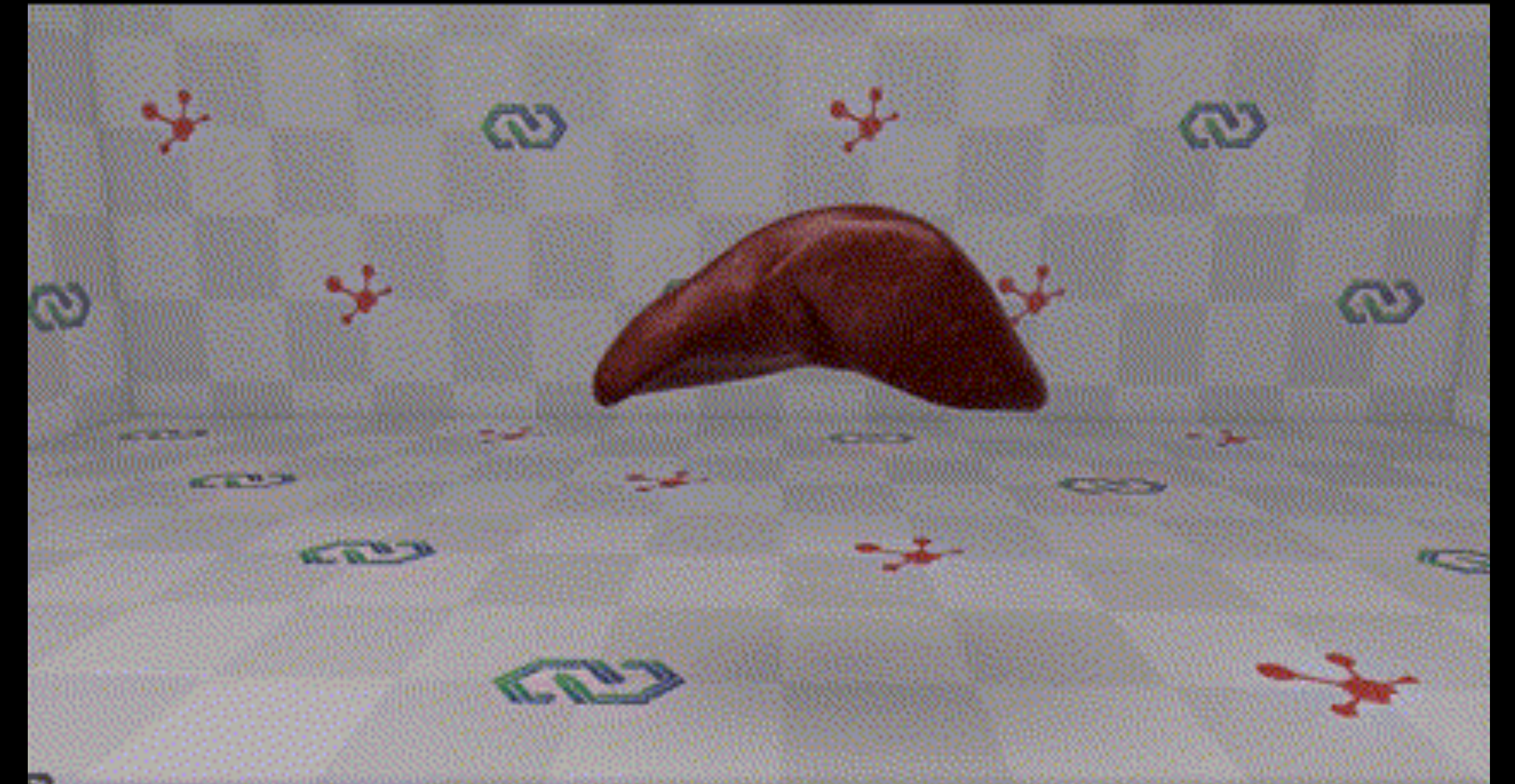
The need for reproducible science



Can generative AI solve data scarcity?

in healthcare

- Towards real-world synthetic datasets
- Generative AI could solve:
 - Copyright
 - Privacy
 - Diversity
 - Complexity



Few Take Aways

1. Open-source is now a commodity
2. Open-source AI is still shaping up
3. Check OSS licensing terms
4. Choose the right license for your work
5. Open collaboration is source of innovation



Thank You