Araya and OIST Publish Research on Jointly Developed Optical Neural Imaging Tool "OptiNiSt"

■**Overview**

Araya Inc. (Head Office: Chiyoda-ku, Tokyo; President & CEO: Ryota Kanai), a company engaged in artificial intelligence (AI) and neuroscience research and development, in collaboration with the Neural Computation Unit at the Okinawa Institute of Science and Technology Graduate University (OIST, President and CEO: Karin Markides), has published a paper on the optical neural imaging analysis tool "Optical Neuroimage Studio (OptiNiSt)" in PLOS Computational Biology on May 19, 2025.

URL: https://journals.plos.org/ploscompbiol/article?id=10.1371/journal.pcbi.1013087&?utm_id=plos1

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■Background

With recent advances in calcium indicators and optical technologies, optical recording of neural activity has become common in neuroscience. However, the growing volume of data and the range of analytical techniques have led to increased complexity in data analysis pipelines, revealing challenges in ensuring the reliability and reproducibility of analyses.：

- With the analysis spanning multiple stages, it is crucial to confirm at each point that the intended operations are correctly performed.
- Optimizing parameters while comparing numerous analysis algorithms is a challenging task.
- Pipelines built through trial and error often suffer from poor manageability, increased risk of errors, and limited reproducibility.

OptiNiSt was developed as an open-source software to address these challenges. Its specifications were designed by researchers at the Neural Computation Unit (led by Prof. Kenji Doya) at OIST, and its implementation was commissioned to Araya Inc. with support from the Brain/MINDS 2.0 program under the Japan Agency for Medical Research and Development (AMED).

■Outcomes Using OptiNiSt

The published paper demonstrates the usefulness of OptiNiSt through practical examples of data analysis:

1. **Improved reliability and validity of analysis:** The step-by-step visualization feature enhances the reliability of analysis results.
2. **Reduced Analysis Time:** An intuitive interface and modular design significantly shorten processing time.
3. **Enhanced Reproducibility:** The ability to save and share analysis pipelines makes it easy to reproduce the same workflow, facilitating the sharing of analysis methods with other researchers and supporting data transparency.
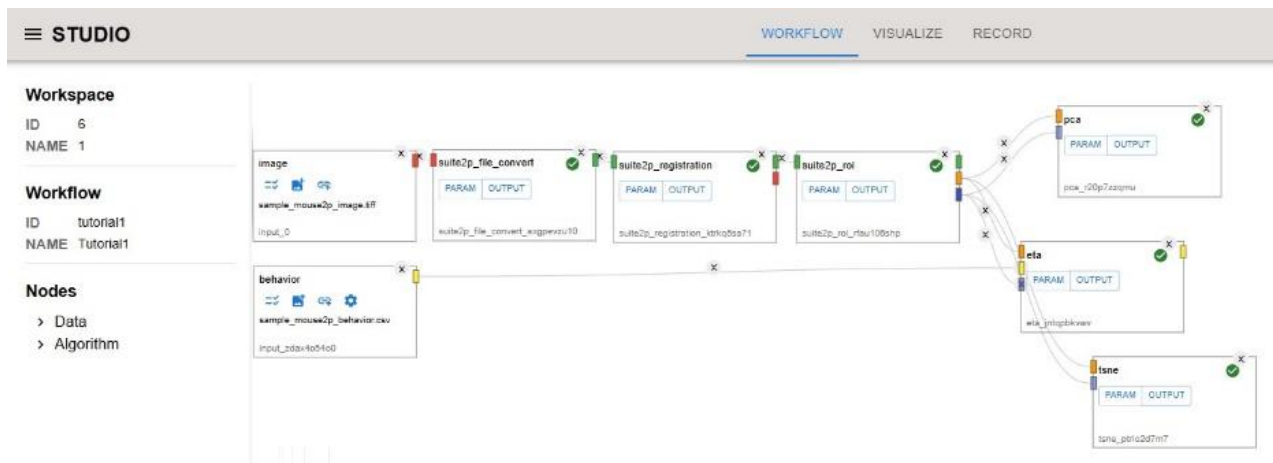

Free download available at:

https://optinist.readthedocs.io/en/latest/index.html

Figure 1: GUI-based interface enables analysis without programming skills
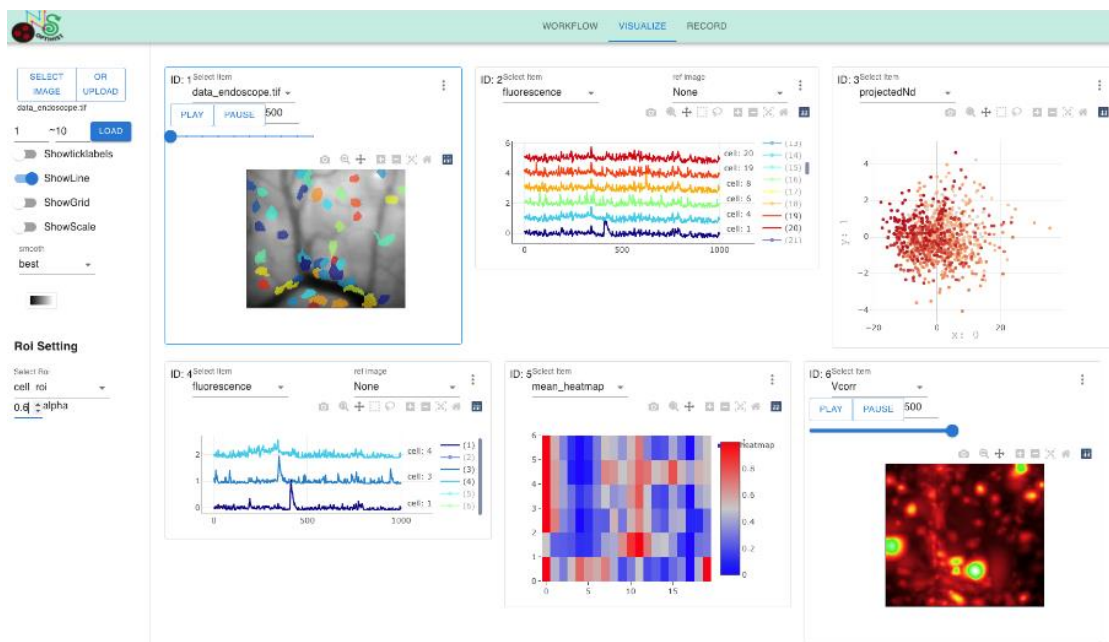
Figure 2: Visualize results using multiple analysis methods on a single dataset

Figure 3: Processed data is stored, contributing to reproducibility

■ **About Araya Inc.**

Araya Inc. integrates cutting-edge AI technologies with neuroscience expertise to support innovation across various industries. Through its "Research DX" initiative, Araya aims to create environments where researchers can focus on discovery and creativity. OptiNiSt is one such solution born from this initiative. Araya is committed to enhancing Japan's research competitiveness and contributing to the advancement of science.

For more details, visit: https://lp.araya.org/neuroai/rdx/en

■ **About OIST**

The Okinawa Institute of Science and Technology Graduate University (OIST) was established in 2011 under the leadership of the Japanese government, with the mission of contributing to the advancement of science and technology worldwide. OIST aims to become a world-class research hub and foster an innovative intellectual cluster by attracting outstanding researchers from both Japan and abroad. As a pioneering graduate university, it promotes cutting-edge research through interdisciplinary collaboration, nurtures the next generation of leaders, and serves as a catalyst for industrial innovation in Okinawa.