

OASIS portable: User-friendly offline suite for secure survival analysis

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ABSTRACT

Online application for survival analysis (OASIS) and its update, OASIS 2, have been widely used for survival analysis in biological and medical sciences. Here, we provide a portable version of OASIS, an all-in-one offline suite, to facilitate secure survival analysis without uploading the data to online servers. OASIS portable provides a virtualized and isolated instance of the OASIS 2 webserver, operating on the users' personal computers, and enables user-friendly survival analysis without internet connection and security issues.

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DESCRIPTION

Statistically rigorous survival analyses have become crucial for biomedical sciences, particularly for lifespan analysis. In addition, recent expansion of biodata depositories allows researchers to perform large-scale retrospective studies for survival analyses that incorporate complex demographic, phenotypic, and genomic information from patients (Coppola et al., 2019). Several user-friendly tools for survival analysis (Han et al., 2016; Yang et al., 2011; Ziehm and Thornton, 2013) have provided web servers, enabling researchers to conduct diverse survival analyses efficiently. However, sporadic service unavailability due to server maintenance and electricity breakdown requires offline tools for users to perform survival analyses without interruption. Additionally, these survival data include potentially sensitive patient information (Kaufman et al., 2009). Thus, strategies for security while manipulating survival analysis data are required (Bonomi et al., 2020; Späth et al., 2022).

Here, we present a portable and offline application for survival analysis (OASIS portable: OASISp), a user-friendly offline suite for secure survival analysis. OASISp replicates the web interface and survival analysis functionalities implemented in the online version, OASIS 2 (<https://sbi.postech.ac.kr/oasis2>), but is designed to operate on a personal computer without an internet connection. Using Docker (Merkel, 2014), OASISp provides a container with a local server and interface and compatible libraries and packages for statistical analysis and visualization (Fig. 1A). This container is virtualized for executing

the software run in isolation from storage, memory, and network. Therefore, users utilize OASISp with their personal computers. Consequently, users can run OASISp on various operating systems, such as Microsoft Windows, Apple MacOS, and Linux, without access to the internet and compromising security.

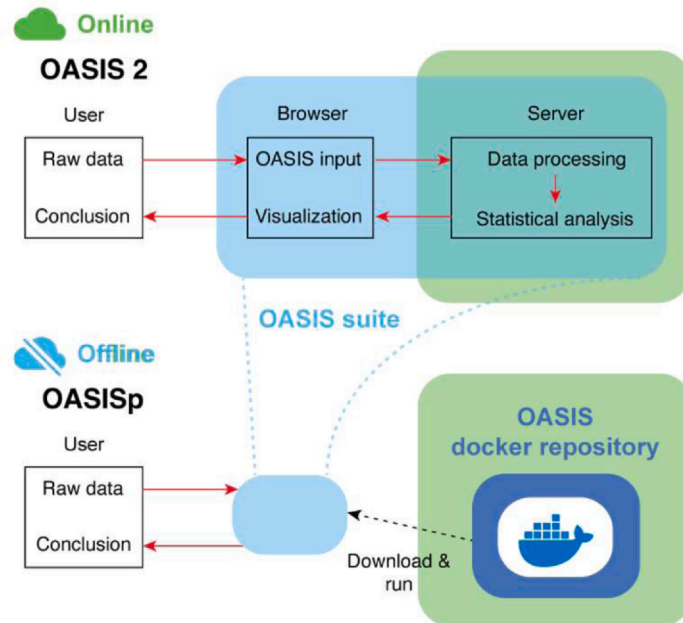
Users can easily install and run OASISp through DockerHub (<https://hub.docker.com>; Figure 1B; see Supplementary Document for the detailed manual). By running the docker image in the repository ([webpeace/oasisp](https://github.com/webpeace/oasisp)), users can emulate the OASIS 2 webserver accessible on their personal computers. Running the docker build of OASISp allows users to access the internal page (<http://localhost:82/oasis2>) for inputting data, conducting survival analysis, and visualizing results. Upon resetting the docker image, users can clear temporary data stored in OASISp, including the input data used for survival analysis.

Overall, OASISp is a complimentary tool for OASIS and OASIS 2 for its standalone availability and security. OASISp, as an all-in-one offline suite, also complements lightweight R packages, such as WLSplot (Mariner et al., 2023), by providing secure survival analyses for researchers who are unfamiliar with programming.

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A



B

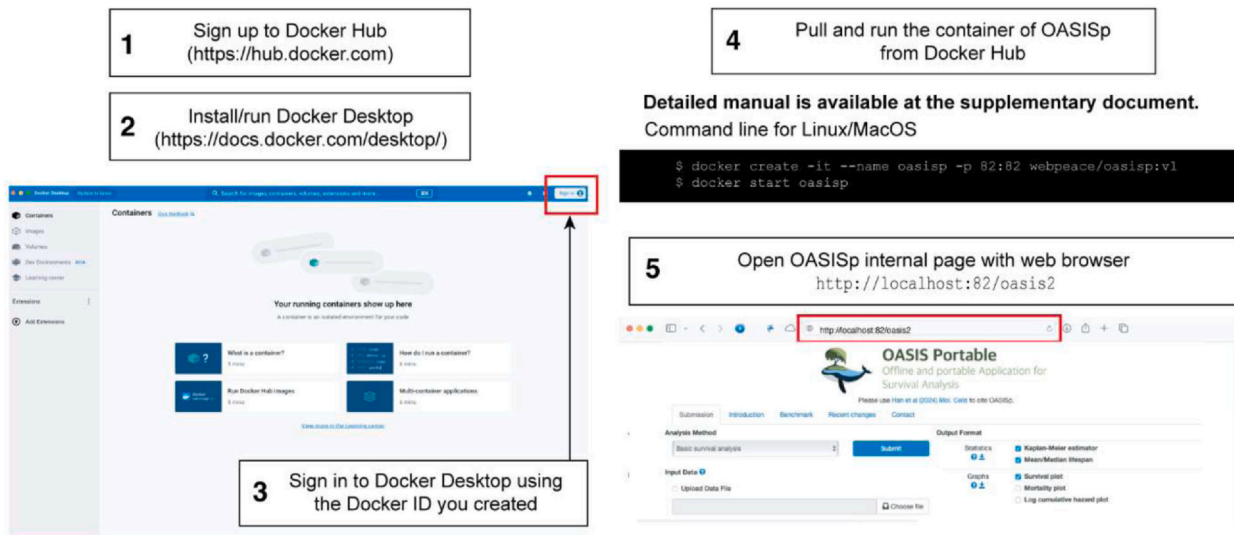


Fig. 1. Schematic diagrams that explain OASIS portable (OASISp). (A) A comparison between the current online application for survival analysis 2 (OASIS 2) webserver and OASISp. Red arrows indicate the flows of inputs and processed data for performing survival analysis. (B) Instructions for users to install and run OASISp. Detailed steps are explained in the [Supplementary Document](#) and <https://docs.docker.com/docker-hub/quickstart/>.

AUTHOR CONTRIBUTIONS

S.K.H., H.C.K., J-S.Y., S.K., and S-J.V.L. wrote the paper.

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DECLARATION OF COMPETING INTERESTS

The authors have no potential conflicts of interest to disclose.

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APPENDIX A. SUPPLEMENTAL MATERIAL

Supplemental material associated with this article can be found online at: [doi:10.1016/j.mocell.2024.100011](https://doi.org/10.1016/j.mocell.2024.100011).

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