

CODE OCEAN

Code Ocean is a centralized platform for the creation, sharing, publication, preservation and reuse of executable code and data. Now, you can deliver a platform to your researchers, faculty and students to work better and smarter; you can support the reuse and reproducibility of research as needed; and you gain better insight to the totality of research that is done at your institution.



A Single Environment

Give your researchers, faculty and students an umbrella of tools to save time and do their work in one place. Using Code Ocean, they can create, collaborate on, share, execute, and publish computational code and data from anywhere, with anyone. All work is contained in a compute capsule, which includes the computational code, data, results and metadata. Using container technologies, code execution is agnostic to programming languages, versions or operating systems. The compute capsule ensures that your researchers, faculty and students can then run their algorithms and (re-)produce results any time — today, tomorrow and in the years ahead.

The screenshot displays the Code Ocean interface for a project titled "Variable gene expression and parasite load predict treatment outcome in cutaneous leishmaniasis" by Camila Farias Amorim et al. The interface is divided into several sections:

- Files:** A file explorer on the left shows a directory structure including "Core Files", "metadata", "environment", "code", "data", and "results". The "code" directory is expanded, showing files like "README.md" (4.13 KB) and "run" (255 B).
- Overview of this repo:** A central pane displays the project's README content, including an abstract and a list of main directories: `/code`, `/data`, and `/data/readMapping/human`.
- Timeline:** A right-hand pane shows a "Re-Run" section with a "Timeline" of actions. It includes a "Published Version 1.0" (Currently viewing) and a "Published Result" (output: 16.64 KB, SupplementaryCodeFile...: 1.96 MB). It also shows a "Created capsule" action on Sep 17, 2019.



Teaching and Learning

Use Code Ocean in teaching and learning. Faculty can set up a capsule on behalf of students, who can then duplicate the capsule and start working individually or as part of a group. As a result, students save significant time as they will not spend time downloading languages, configuring files and dependencies. Faculty will also have insight into the student's work and can see, for example, how much time a student spends in the capsule, runs and reproduces the work.

Reproducibility and Re-use

With Code Ocean, the research community can readily reproduce and re-use computational code and data in support of open science mandates. Once researchers are up and running, Code Ocean also speeds the time in which research is produced and disseminated, so they can collaborate and iterate in near real-time.

Increased Citations

Code Oceans supports the minting of a DOI for each published compute capsule, which can be associated with the published paper. As a result, researchers can be cited for more than just their article.

Institutional Stewardship

When you provide a centralized platform to your researchers, you gain much-needed stewardship over the totality of the institution's research output. This means you can readily collect computational code and data for inclusion in the (institutional) repository, preserve it, and understand its impact through in-depth analytics.

Enterprise Benefits

An institutional subscription offers the following benefits:

- Premium benefits for researchers in your organization including private groups and priority support
- Administrative dashboard where an administrator can manage users and groups
- Institutional- and capsule-level metrics
- Transfer of individual files of any published compute capsule to the institutional repository
- Preservation of individual files of any published compute capsule to CLOCKSS (Controlled LOCKSS) archive
- Single sign-on to the platform (SSO)
- Onsite workshops and online training sessions

Publisher Integrations

Through Code Ocean's many publisher partnerships, compute capsules may be automatically included with the author's manuscript submission. Examples of publisher partnerships include:

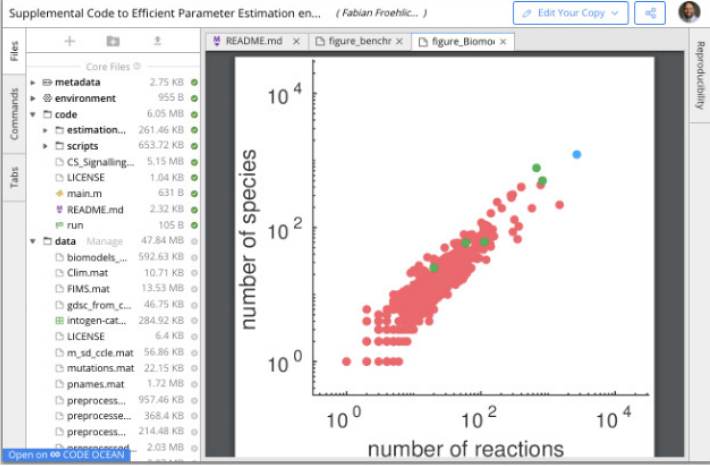
- Cambridge University Press
- Nature
- IEEE
- F1000
- T&F
- SPIE
- De Gruyter
- Cell Press
- Elsevier
- Gigascience (OUP)
- AACR
- BMJ

Cell Systems

Efficient Parameter Estimation Enables the Prediction of Drug...

Code Ocean Capsule

Supplemental Code to Efficient Parameter Estimation en... (Fabian Froehlic...)



Introduction

High-throughput experimental techniques are key for the comprehensive understanding of biological processes (Garnett et al., 2012, Marcotte et al., 2016, Seashore-Ludlow et al., 2015, The Cancer Genome Atlas Network, 2012). The analysis, integration, and interpretation of high-throughput data require computational methods. At the heart of this endeavor are usually mathematical models (Aldridge et al., 2006, Eduati et al., 2017). As widespread statistical models do not provide mechanistic insights, mechanistic models become increasingly important (Sanghvi et al., 2013). Mechanistic models featuring ordinary differential equations (ODEs) aim at a quantitative description of biological processes by systematic integration of prior knowledge and experimental data. These models have been used for the analysis of signal processing mechanisms (Bachmann et al., 2011), for the identification of drug targets (Schoeberl et al., 2009), as well as the development of prognostic signatures (Eduati et al., 2017, Fey et al., 2015). In the field of cancer research, mechanistic modeling has facilitated the study of oncogene addiction (Weinstein and Joe, 2006), synthetic-lethal phenotypes (Kaelin, 2005), and many other relevant phenomena (Zhang et al., 2009).