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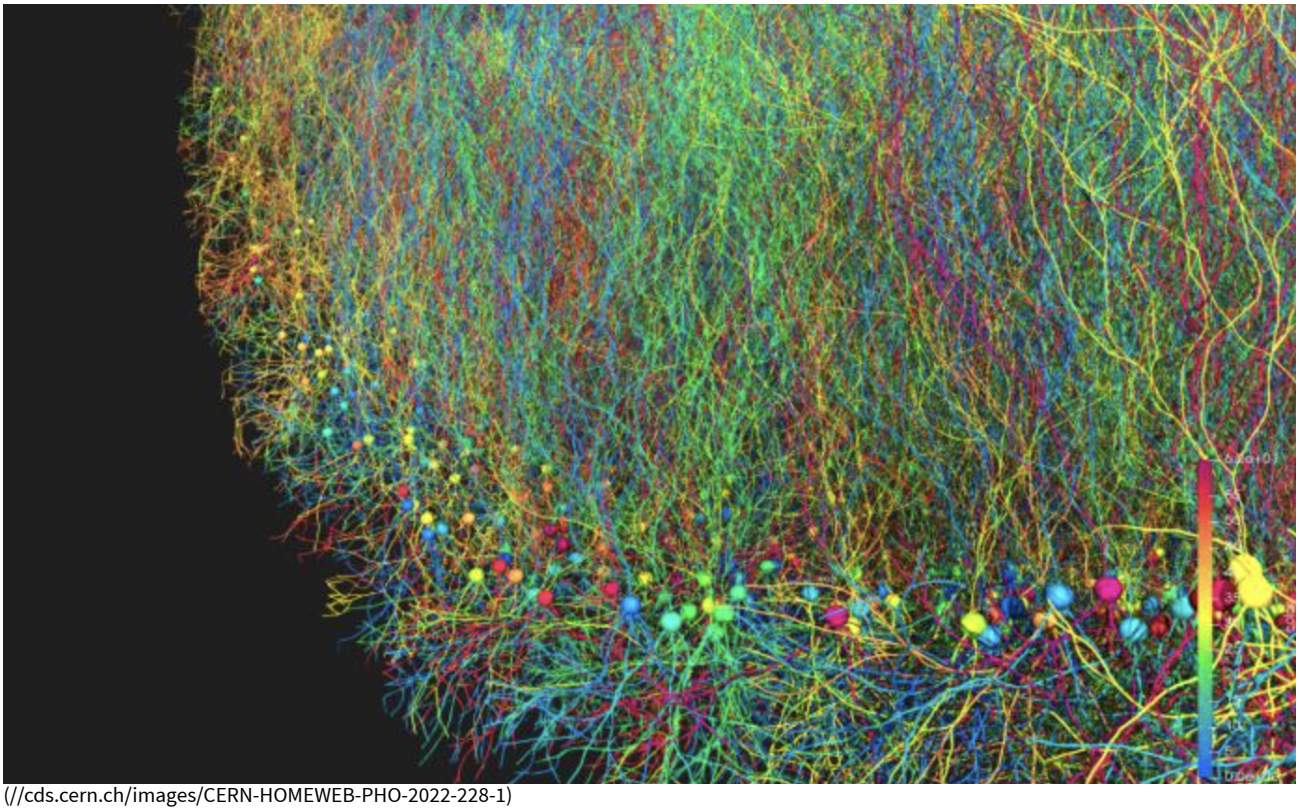
BioDynaMo modelling platform accelerates biological simulation and more

The BioDynaMo project, launched by CERN openlab in 2015, has now reached maturity and is seeking new applications

7 DECEMBER, 2022 | By Andrew Purcell (/authors/andrew-purcell)



(//cds.cern.ch/images/CERN-HOMEWEB-PHO-2022-228-1)

A simulation created with the BioDynaMo platform (Image: CERN)

BioDynaMo (https://biodynamo.org/) (Biology Dynamics Modeller) is an open-source software platform for creating, running and visualising all kinds of 3D agent-based simulations. Agent-based modelling focuses on the individual active components of a system. It is a powerful methodology for studying complex systems in biology, epidemiology, economics, social sciences, medicine and more.

The BioDynaMo project was launched in 2015 as part of CERN openlab (https://openlab.cern/)'s work with Intel on code modernisation, and received support from the CERN budget for knowledge transfer for medical applications (https://kt.cern/medical-applications-knowledge-transfer-fund/cern-medical-applications-budget-overview). Its primary goal was to accelerate biological simulation.

The main advantage of BioDynaMo compared with similar tools is that it has been heavily optimised to take full advantage of modern (multi-core and GPU) hardware and can greatly reduce simulation time, thus allowing researchers to simulate several scenarios in a reasonable time frame. These features have convinced several laboratories to switch to BioDynaMo for running their simulations. For example, the platform has been used to simulate the spread of COVID-19 (https://biodynamo.org/blog/epidemiology-final/) in enclosed spaces and to examine socio-economic inequities in the Netherlands. (https://kt.cern/news/news/knowledge-sharing/cern-technology-support-study-socio-economic-inequities-new)

The technical coordination of the BioDynaMo project has now been transferred from CERN to the University of Cyprus (https://scimpulse.blogspot.com/2022/11/the-biodynamo-consortium-welcomes-its.html). This marks a significant milestone in the lifecycle of the project. The project team thanks Fons Rademakers and his colleagues for the excellent job they have done guiding BioDynaMo's development and is now actively seeking new applications for this powerful platform. "We are proud to have incubated this successful project," says Alberto Di Meglio, head of CERN openlab. "With BioDynaMo having reached a sufficient level of technical maturity, the time is right for the consortium to explore new applications in and partnerships with other research fields, ensuring maximum impact for society."

BioDynaMo is one of the technologies selected for the CERN Technology Impact Fund (https://cernandsocietyfoundation.cern/projects/biodynamo), a new scheme that supports CERN technologies with a strong potential to address global societal issues.

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More information on the BioDynamo website (https://biodynamo.org/).

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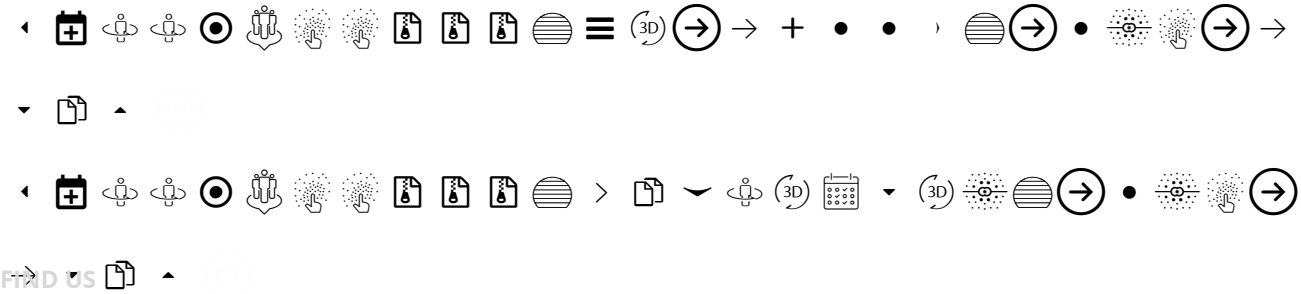

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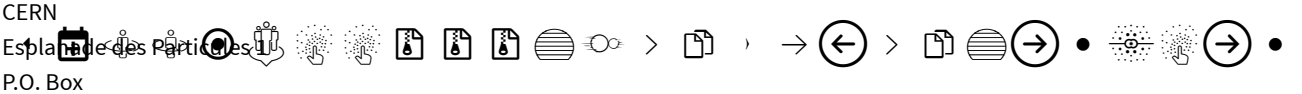

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