

Surrey develops a breakthrough new simulation platform

Computer scientists from the University of Surrey have helped to create state-of-the-art software that could be used to simulate how the brain develops or cancers progress, allowing healthcare professionals to develop better treatment strategies.



Credit: Getty Image

Together with partners across seven international organisations, Surrey has released the BioDynaMo v1.0 - a software platform designed to create, run and visualise 3D agent-based simulations.

The open-source code is available to download from the [BioDynaMo website](#).

Agent-based simulations are central to a wide range of research fields, from biology to business and epidemiology to economics. This powerful new platform could play a key role in unlocking exciting discoveries in a range of scientific fields.

The BioDynaMo consortium includes the University of Surrey, CERN, Newcastle University, GSI Helmholtz Center, University of Cyprus, University of Geneva, ImmunoBrain Checkpoint and SCImPULSE Foundation.

Dr Roman Bauer, Lecturer of Computer Science at the University of Surrey and spokesperson for BioDynaMo, said: "We have built the BioDynaMo platform to help scientists perform simulations of previously unimaginable scale and complexity. Our platform makes it possible to tackle challenging scientific questions - helping us understand how diseases such as COVID-19 could affect different communities across the globe."

"We hope that the versatility and usability of this open-source software will lead to BioDynaMo becoming a standard tool for reproducible computational research."

Dr Fons Rademakers, CERN openlab Chief Research Officer and BioDynaMo engineering leader, said: "We are proud to be bringing our expertise in computing and simulation to this exciting project as part of CERN's knowledge transfer activities for the benefit of medical applications. We spent a lot of time and effort on the simulation engine's scalability by using multi-threading and GPU acceleration extensively throughout the code. Also, the code quality is constantly monitored by many tests continuously executed during the development. Although this is a v1.0 release, we feel very positive about it and very sure that this is only the beginning."