Poster presentation

The role of the Neurospaces project browser in the GENESIS 3 software federation: Design and targets

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A computational model is a tool to increase human understanding of a complex system. The scientific advances made through computational modeling result in refinements of the biological models used for research. This interaction between a biological model and scientific advance is in sharp contrast to current publication media which fix in time both scientific knowledge as well as the tools used to acquire it.

As an example, the Purkinje cell model that was originally published in 1994 [1] has been widely used for both educational purposes and research projects. Different researchers have made many small modifications to this model, such that at present, many parallel versions of this model coexist. No one can explain the detailed relationships between the different development branches of this model, because no tools exist to track the development of a computational model, neither during a research project, nor between research projects.

Therefore, in order to advance publication technology, we have started building a web-enabled database infrastructure, tailored to the needs of computational model publication [2-5]. The Neurospaces project browser [5] – a software component of the GENESIS 3 software federation – acts as a simulation definition and exploration frame for model behavior, and guides the definition of relationships between biological questions and a simulation. These relationships form the core of a research project, but can also be used for tutorial purposes and as an educational resource. The technical core of the project browser relies on the fact that model definition is sepa-

rated from the definition of how a simulation is controlled. This fundamental separation allows a software system to track the changes to both independently. Annotation of model definition and simulation control scripts is implemented using recent advances in cryptographic signing. Such annotation can be used as a framework for quality assurance. We expect that these technologies will have a significant impact on scientific communication, publication and collaboration.

In this presentation we document the targets of the project browser, the design and software architecture, the current status of the implementation, and future directions.

Acknowledgements

References

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