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Four-Dimensional Modelling of Genetic Disease Patterns

Status	Current
Competition	III
Sector	Development of New Technologies
Genome Centre	Genome Alberta
Project Leader	Christoph Sensen

Project Description

Prodigious masses of data are being generated by genomic technologies. Finding a way to visualize new data, and to model genetic disease patterns, is the goal of Dr. Christoph Sensen and his team. Dr. Sensen is professor of Biochemistry and Molecular Biology at the University of Calgary and Director of the Sun Center of Excellence for Visual Genomics.

Dr. Sensen is project leader of Four-Dimensional Modelling of Genetic Disease Patterns.

According to Dr. Sensen, this project will develop a never-before-seen approach to study genetic disease by creating fully integrated virtual-reality models of all aspects of disease. Team members will generate approaches in four dimensions (three spatial dimensions – the fourth dimension being time) in order to investigate the nature of genetic diseases.

This 4-D project will make it possible for investigators to immerse themselves directly within an organism, to “see” the inner workings of its genome and to study the way genetic changes affect the organism over time. Moreover, they will be able to navigate through surrounding data in a virtual reality landscape, and to interact with data in a user-friendly manner.

The virtual reality models of all aspects of disease will include medical information, advanced imaging data, test results such as biopsies and gene expression data and finally information about the structure, function and interactions of proteins.

Building on the highly successful Integrated and Distributed Bioinformatics Platform for Genome Canada, Dr. Sensen’s team has become one of the few teams in the world with the computational power to successfully undertake this new 4-D project. The team expects to advance the field of genomic research, while developing a spin-off company that will market 4-D services to the global pharmaceutical industry.