**Abstract**

Proteins are present in all cells of our body. They drive inner chemical processes and as soon as we will be able to understand their function, we will understand the principles of our body as well. It will lead to faster design of new medications and in consequence deadly diseases, such as HIV, cancer, or Ebola will eventually fade away.

The goal of our project is to contribute to the process of understanding proteins. We will develop a revolutionary new visualization technology to study interactions between several (more than two) proteins, we will integrate these techniques into a visual analysis environment, and propose a formalism for an automated synthesis of visual analysis systems. This will help the biologists in their process of searching for the best contact zones on the surfaces of the proteins where these proteins are mutually interacting. Our newly proposed techniques will be tested on real data, namely on proteins which are responsible for cell division.

All proposed techniques will be integrated into the existing CAVER Analyst software tool. This visualization tool is currently successfully used in protein engineering and drug design for studying interactions between a protein and small molecules.