

Dr. Adhikari receives a National Science Foundation (NSF) award to develop Deep Learning methods for computational biology.

Deep Learning, a subfield of artificial intelligence (AI), is already becoming a part of our daily lives. It is used in face recognition, self-driving vehicles, disease predictions, and has many other practical applications. Some even argue that AI is the new electricity. The full potential of Deep Learning is yet to be explored for solving many scientific problems. At UMSL, Dr. Adhikari's group is interested in investigating how Deep Learning-based methods may be developed to improve human health. In particular, his group is interested in a specific problem known as protein inter-residue distance prediction. Proteins are the gears of life and they do most of the work in our cells. Accurately predicting protein distances will lead to a better understanding of many incurable diseases and enable a much faster development of therapeutics.

It is currently an open question which types of Deep Learning algorithms are best suited for solving the problem of protein distance prediction. The National Science Foundation (NSF) has funded Dr. Adhikari to push forward the current advances in Deep Learning methods and to increase our understanding of which kinds of Deep Learning algorithms are effective for solving fundamental biological problems such as protein structure prediction.

The image below shows the 3D structure of an antimicrobial protein along with its distances as a chord diagram (on the left) and as a distance heatmap (on the right). The image comes from a project that Dr. Adhikari's graduate students Bikash Shrestha and Matthew Bernardini are currently working on.

The NSF award and the proposal abstract can be viewed at https://www.nsf.gov/awardsearch/showAward?AWD_ID=1948117

