IS A BLIND WATCHMAKER THE SAME AS A BLIND NEURAL NET?

Andrew D. Ellington

Professor
Center for Systems and Synthetic Biology
University of Texas at Austin

Abstract: Directed evolution is a powerful tool for engineering proteins. The Ellington lab has previously used directed evolution to alter the substrate specificities and thermostabilities of a wide variety of enzymes, including polymerases. However, machine learning approaches provide a broad 'view' of the evolutionary landscape, by using phylogeny and natural protein structures to learn how sequences play out in terms of structure and function. The extraordinary and subtle understanding now provided by machines, coupled with synthetic biology approaches, provides new opportunities for quickly engineering proteins. We will show several examples of coupled machine learning / protein engineering approaches, relevant to a variety of technological and societal problems.

Bio: Andy Ellington is the Fraser Professor of Biochemistry at the University of Texas at Austin. He is best known for directed evolution approaches, beginning with the development of nucleic acid selection methods, but proceeding to surf fitness landscapes with both proteins and organisms. He maintains strong interests in advancing both biosecurity (serving on the Security Working Group of the EBRC) and undergraduate education (as a HHMI Professor).