

Combinatorial Optimization and Structures in Bioinformatics and Computational Biology

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The areas of bioinformatics and computational biology have exploded in recent years with a huge growth of interest and activity. There have been many applications of combinatorial optimization and combinatorial structures in those fields. The most widely applied combinatorial method is dynamic programming, which arises in many diverse applications in bioinformatics and computational biology. But applications of graph theory are also common (chordal and interval graphs as well as more ad hoc applications), and there have also been a few applications of network flow, matroid theory and integer programming. In this talk I will survey some of these applications and combinatorial structures. The examples will come mostly from my own work, for convenience in preparing this talk, but I will also mention work of others in order to illustrate the range of applications and techniques that have appeared. The underlying message is that bioinformatics and computational biology is a productive arena to for research involving combinatorial optimization and combinatorial structure.