



DNA Computing

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Inventors

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Patent Pending

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Invention Description

Computing by representing information in the form of DNA base sequences has several potential advantages over silicon-based computing methods, due to the massive parallelism of the biochemical reactions on DNA molecules. These advantages include, enhanced processing speeds, reduced energy consumption and greater storage capacity. DNA computing can solve problems intractable by conventional methods including but not limited to, organization of massive evacuations, organization of response to invasion, supply chain problems, and computer chip assembly problems. As a result, there is tremendous interest in utilizing the computing capacity of DNA. One of the major hurdles that must be overcome in order for DNA computing to become a tangible reality is the nondeterministic polynomial (NP) optimization problem, a class of optimization for which no efficient algorithm has been developed. Thus improved DNA-based computing methods for solving NP optimization problems are needed in the art.

In response to this need, researchers at Arizona State University have developed a novel approach to using DNA-based computing methods to solve the NP optimization problem by exploiting the hybridization properties of oligonucleotides.

Potential Applications

- **Computing Industry**
- **Information Technology Industry**

Benefits and Advantages

Overcoming the NP optimization problem allowing for the use of DNA computing has the following advantages

- **Enhanced processing speeds**
- **Reduced energy consumption**
- **Greater storage capacity**