

# INTERACTIVE VISUAL ANALYSIS FOR THE DESIGN OF DNA NANOSTRUCTURES

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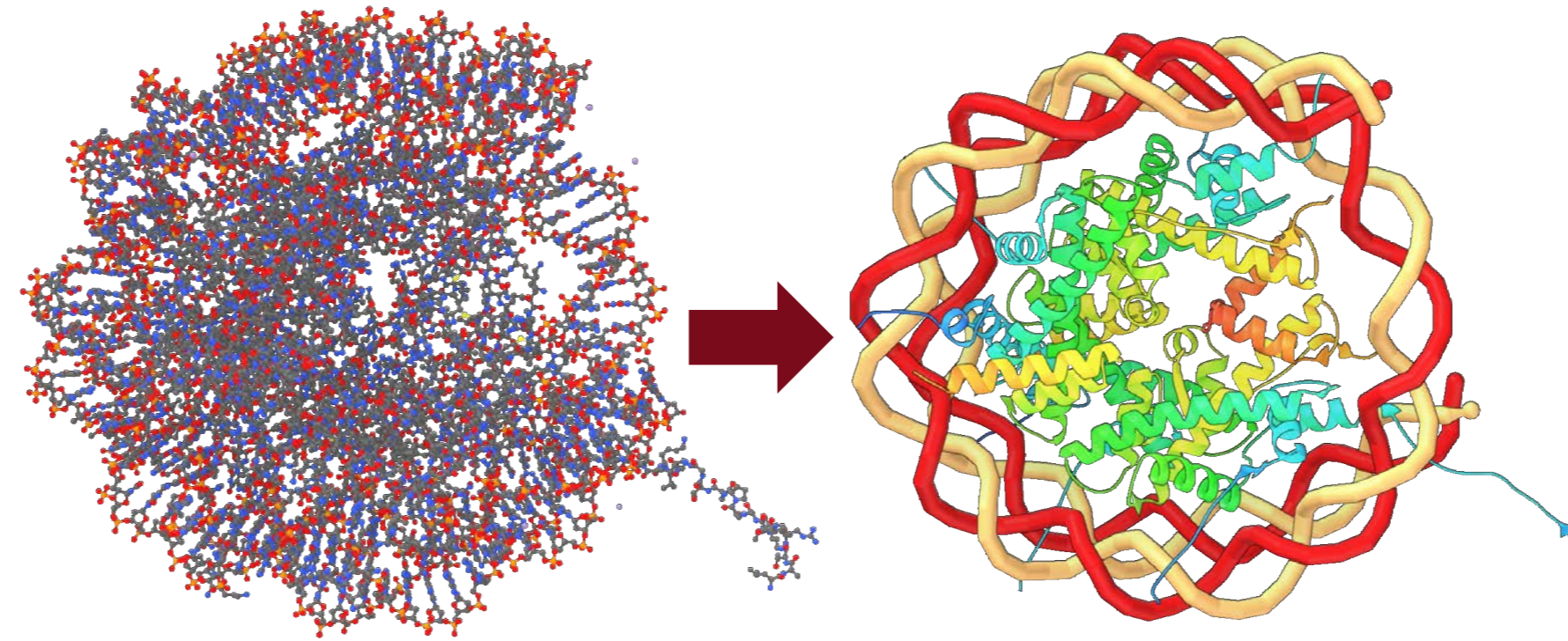


## INTRODUCTION

We propose an interactive 3D visualization software for the design of DNA nanostructures. Abstract representations [1, 2] are fundamental for inspection and 3D modeling of DNA-based structures. We can load files, such as caDNA<sup>no</sup> [3], DAEDALUS [4], and PDB or synthesize them within our system. Using animation a smooth transition between different types of representation is facilitated and correspondence between them can be directly perceived.

## ABSTRACTION

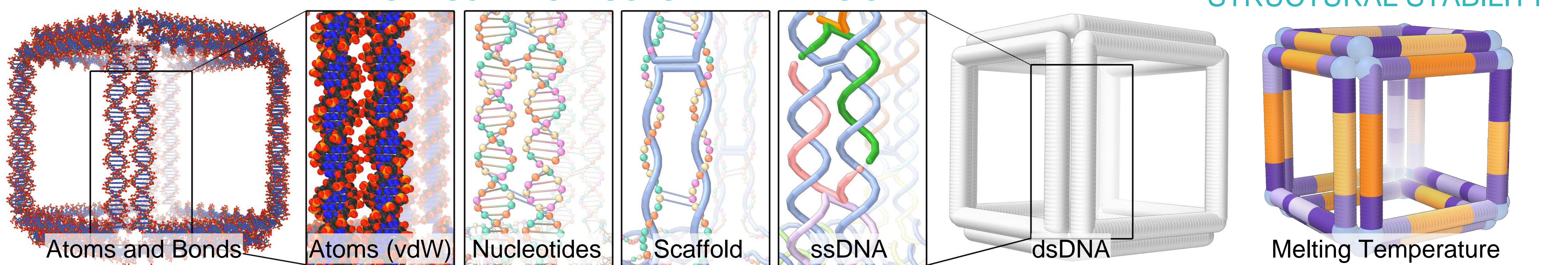
Our system abstracts the atomistic structure and creates high-level representations (PDB-ID: 1AOI).



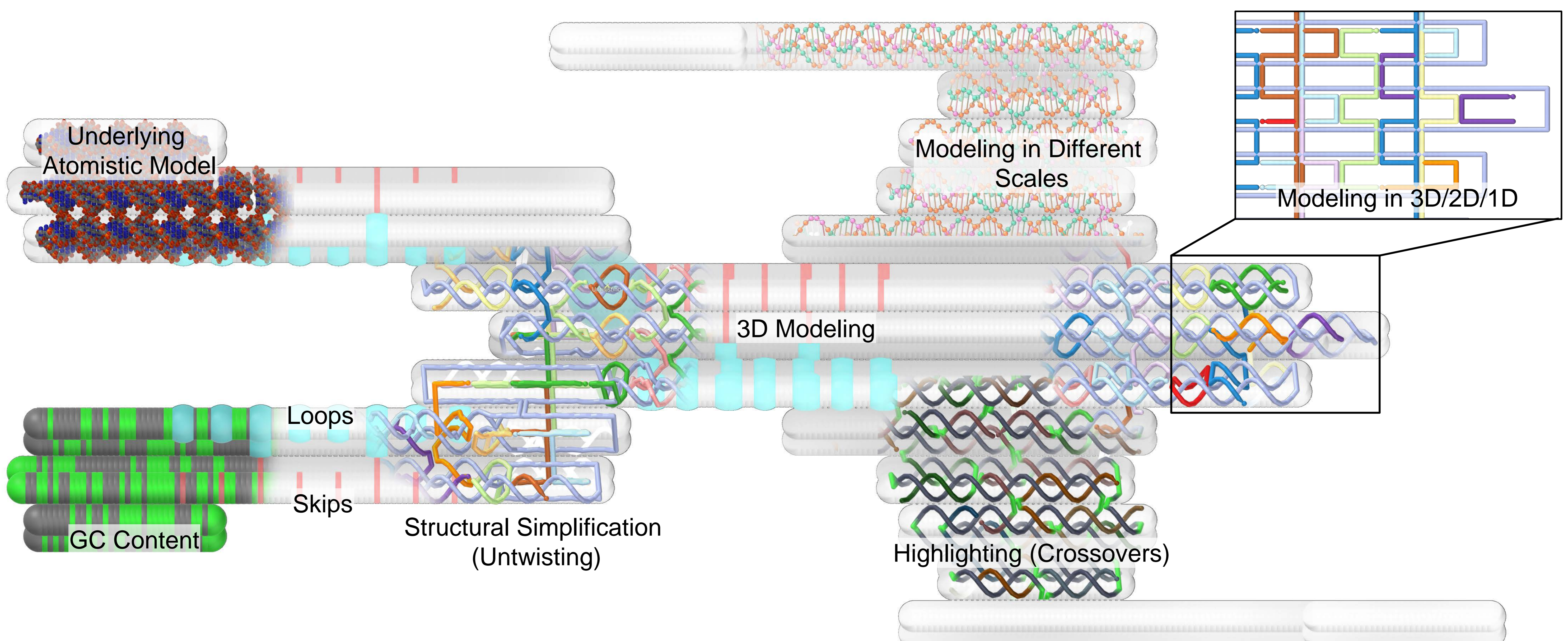
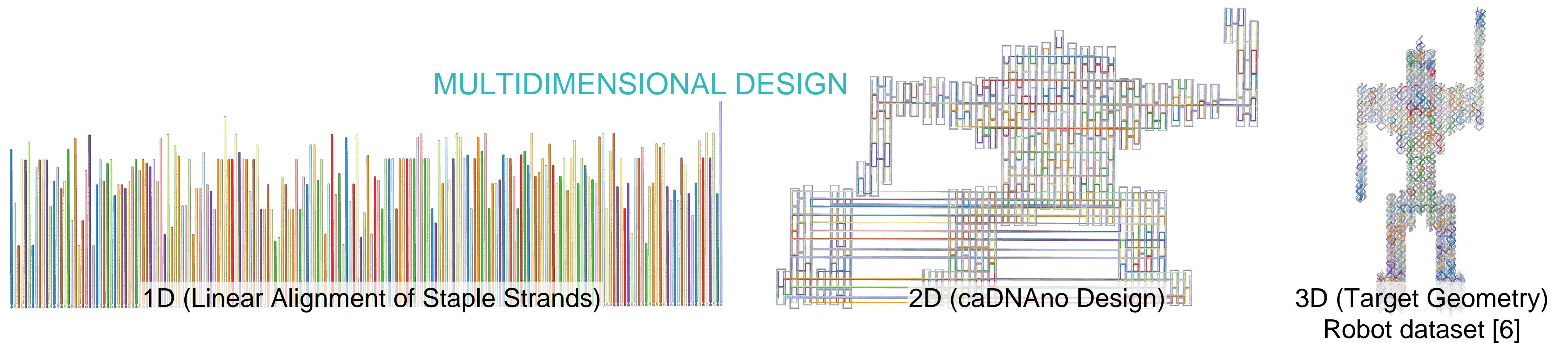
## SOFTWARE

The visualizations are implemented in the **Adenita** toolkit. The software is an integrated module in the SAMSON framework [5]. The upcoming release of the Adenita toolkit will be available on <http://maraproject.eu/>.

## MULTISCALE STRUCTURAL ANALYSIS



## MULTIDIMENSIONAL DESIGN



- [1] H. Miao, et al., Multiscale visualization and scale-adaptive modification of DNA nanostructures, IEEE Transactions on Visualization and Computer Graphics. 2018, 24, 1014–1024.  
 [2] H. Miao, et al., DimSUM: Dimension and scale unifying map for visual abstraction of DNA origami structures, Computer Graphics Forum. 2018, 37, 403–413.  
 [3] S. M. Douglas, et al., Rapid prototyping of 3D DNA-origami shapes with caDNA<sup>no</sup>, Nucleic Acids Research. 2009, 37, 5001–5006.  
 [4] R. Veneziano, et al. Designer nanoscale DNA assemblies programmed from the top down, Science. 2016, 352, 1534:1–1534:15.  
 [5] NANO-D, Inria. SAMSON – Software for adaptive modeling and simulation of nanosystems. Website: <https://samson-connect.net>.  
 [6] C. E. Castro, et al., A primer to scaffolded DNA origami. Nature Methods 8. 2011, 3, 221–229.