IT 468- Introduction to Natural Computation

Home Work 4

Computational DNA Origami

Due date: September 23, 2013

(1) Download and install the software CadNano from http://cadnano.org/. Using the method given in the primer paper please make the robot as discussed in the paper.

(**Hint:** Read the following paper A primer to scaolded DNA origami Carlos Ernesto Castro, Fabian Kilchherr, Do-Nyun Kim, Enrique Lin Shiao, Tobias Wauer, Philipp Wortmann, Mark Bathe and Hendrik Dietz and look at the supplementary material.

(2) Download and install the software SARSE either on Mac or Linux from http://cdna.au.dk/software/ and design the dolphin as discussed at the home page and in the paper.

(**Hint:** Read the paper DNA Origami Design of Dolphin-Shaped Structures with Flexible Tails by Ebbe S. Andersen, Mingdong Dong, Morten M. Nielsen, Kasper Jahn, Allan Lind-Thomsen , Wael Mamdouh, Kurt V. Gothelf, Flemming Besenbacher and Jrgen Kjems.)

(3) Download and install the software Tiamat from http://yanlab.asu.edu/Resources.html. Using Tiamat design some new tiles which are not listed on the home page.

(**Hint:** Read the paper Tiamat: A Three-Dimensional Editing Tool for Complex DNA Structures, by Sean Williams, Kyle Lund, Chenxiang Lin, Peter Wonka , Stuart Lindsay, and Hao Yan and also read the manual given at http://chemistry.asu.edu/faculty/download/Manual.pdf)

(4) Download and install the software Nanoengineer-1 from http://www.nanoengineer-1.com/content/. You may find it at github etc. as well. Design something of your choice of DNA structure that you think is useful for DNA computing.