

Sequential Self-assembly of DNA-based Nanoscale Platform for the Fabrication of Nanophotonics

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Technical Report No. UCB/EECS-2023-237

<http://www2.eecs.berkeley.edu/Pubs/TechRpts/2023/EECS-2023-237.html>

November 21, 2023

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Title

**Sequential Self-assembly of DNA-based Nanoscale Platform
for the Fabrication of Nanophotonics**

by Author Myoungseok Kim

Research Project

Submitted to the Department of Electrical Engineering and Computer Sciences,
University of California at Berkeley, in partial satisfaction of the requirements for the
degree of **Master of Science, Plan II**.

Approval for the Report and Comprehensive Examination:

Committee:

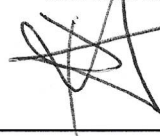
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(October 31, 2023)

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(November 1, 2023)

Abstract

Structural DNA nanotechnology has emerged as a versatile approach to building nanometer-precise structures for arranging non-DNA optical nanomaterials. To enable complex optical functions, systematic assembly rules for DNA assemblies into 2D and 3D nanostructures have been developed. However, the low purity and yield of the target superstructure is a major limitation for further development and practical applications. Here, inspired by oligonucleotide synthesis on the solid support, we propose a sequential assembly of DNA structures using the magnetic beads. The iterative addition of DNA origami tiles followed by the washing step enabled multi-origami assemblies with higher yield and purity compared to any existing approaches. We envision this method to complement existing approaches to extend what is possible to construct with DNA.