

CAD Design Project 5 – OpenROAD (Final Project)

Due: 23:59, Dec. 18, 2024

OpenROAD is a project in the US DARPA IDEA program that pursues open-source tools for 24-hour, "**no human in the loop**" digital layout generation across integrated circuit, package, and board domains. The development of open-source, self-driving design tools is an ambitious "**moonshot**" project with numerous technical and cultural challenges. In this final project, you are going to thoroughly study and evaluate the OpenROAD design flow. Complete a study report which consists of 3 parts:

1. Based on your preliminary report in Project 1 and the knowledge you have learned in this course, you are now capable of detailing the incremental progress of each step and the standard cell design flow.
2. You are required to submit your preference list of the first five major design-flow stages, (1) **synthesis**, (2) **floorplanning**, (3) **placement**, (4) **clock tree synthesis**, and (5) **routing**, before December 1. A lottery-based bidding process will be held to determine the major design-flow stage you are going to have an in-depth survey. Based on the announcement of the bidding result, which will be announced on December 2, perform in-depth experiments and analyze and compare the algorithm flows and outcomes of the selected design-flow stage. You are encouraged to change different designs, use different fabrication technologies, adjust the internal scripts, and evaluate/analyze the outcomes.
3. Submit a comprehensive report detailing the modifications made to designs, scripts, fabrication technologies, and other elements/parameters during your in-depth experiments. Based on your findings, provide technical review comments on the specific design-flow stage you focused on, along with overall feedback on the OpenROAD design flow. Additionally, comments and suggestions for improving our CAD course are highly welcomed.

Reference:

[1] The OpenROAD Project – Foundations and Realization of Open and Accessible Design

URL: <https://theopenroadproject.org/>

[2] *OpenROAD* (Source code)

URL: <https://github.com/The-OpenROAD-Project>