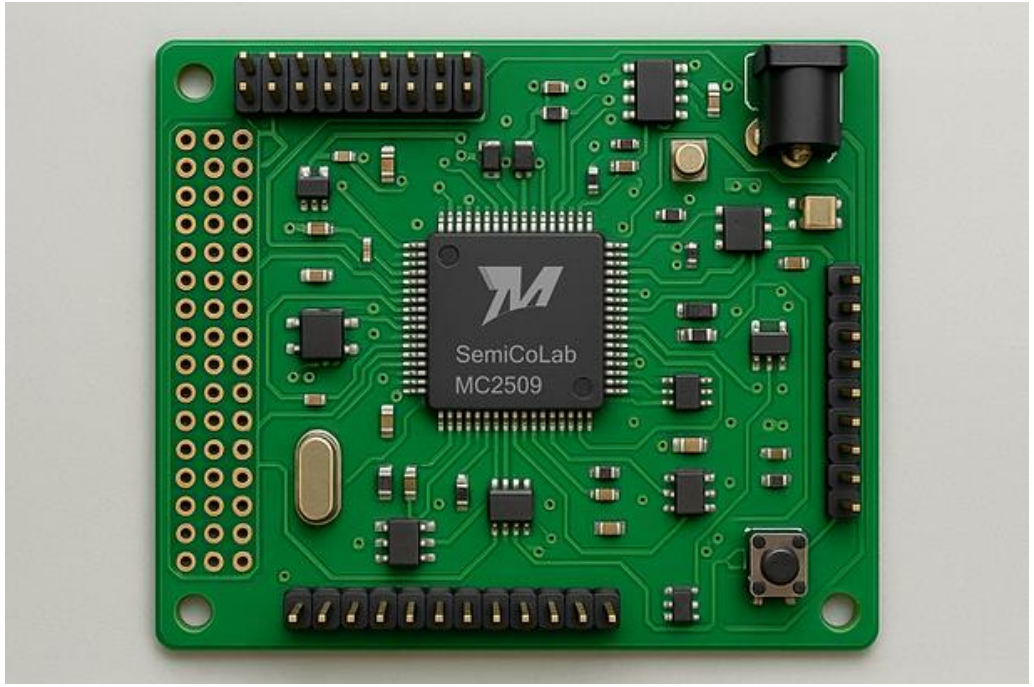
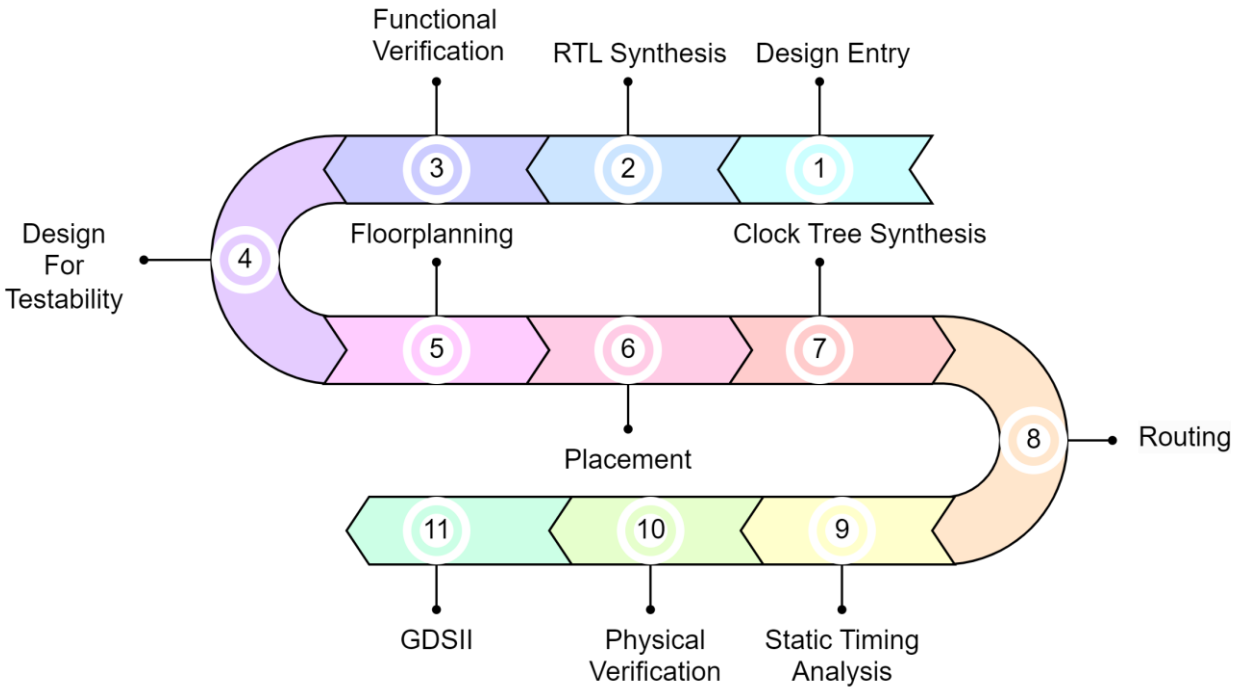
SEMICOLAB,
A MULTI-PROJECT ASIC PLATFORM FOR DEMOCRATIZING CHIP DESIGN

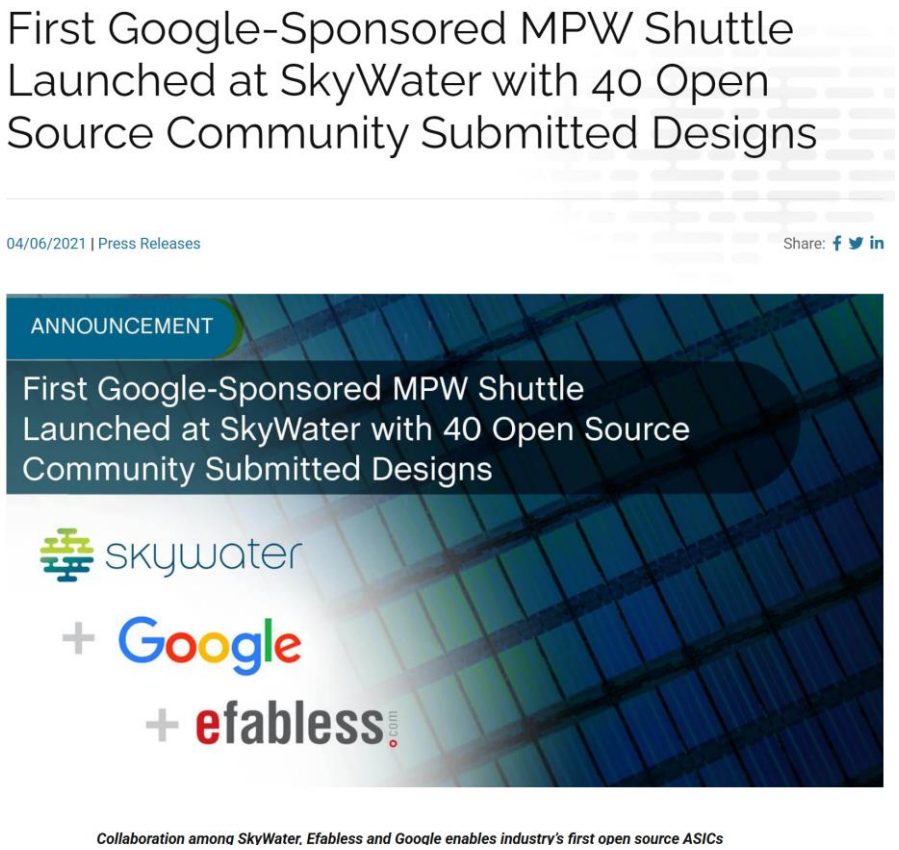


DR. EMILIO BAUNGARTEN, DRA. SUSANA ORTEGA,

DR. MIGUEL RIVERA, AND DR. FRANCISCO JAVIER

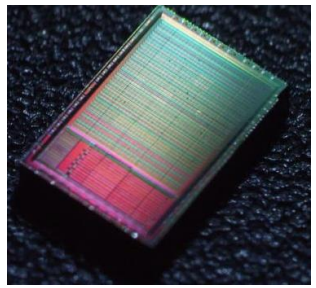


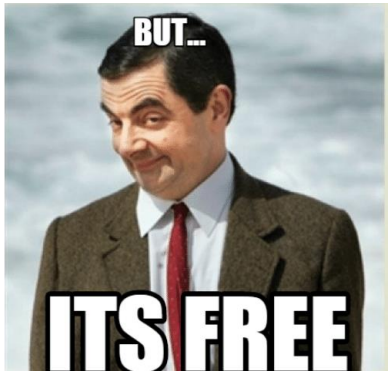
The RTL-to-GDSII design flow using open-source tools has matured significantly in recent years, becoming both well established and extensively documented by the open-source silicon community. Thanks to continuous contributions from researchers, practitioners, and tool developers, the methodology is now widely understood, with clear guidelines, tutorials, and reference designs that demonstrate each stage of the digital implementation process.



A big part of this open-source tool movement was started by the Google-sponsored Multi-Project Wafer (MPW) programs.

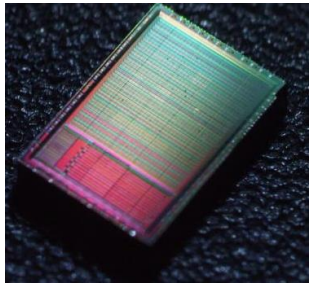
The offer was simple and irresistible:
who wouldn't want a free chip?



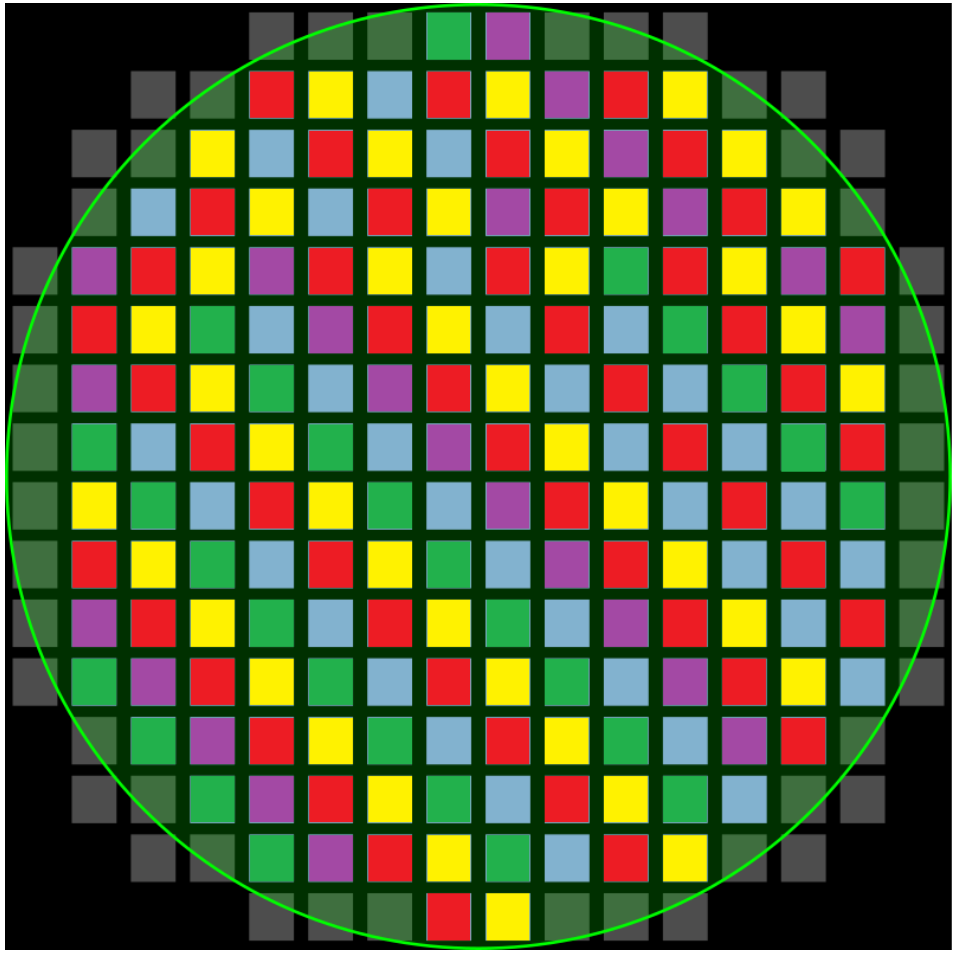


A big part of this open-source tool movement was started by the Google-sponsored Multi-Project Wafer (MPW) programs.

The offer was simple and irresistible:
who wouldn't want a free chip?



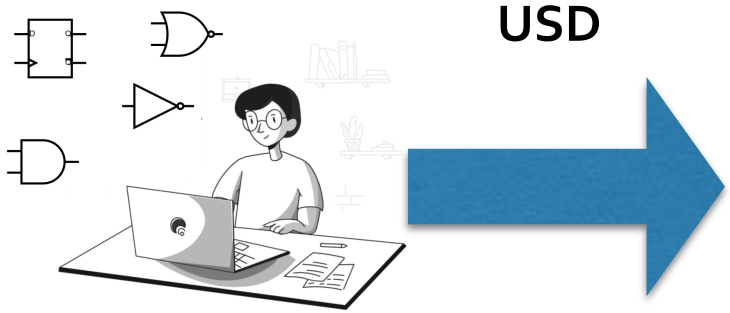
Although the free manufacturing rounds eventually ended, the MPW program itself continued, sustaining momentum within the open-source silicon community. Even without fully sponsored runs, designers remained engaged, motivated by the accessibility of the flow and the proven success of earlier shuttles.

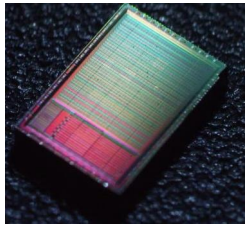


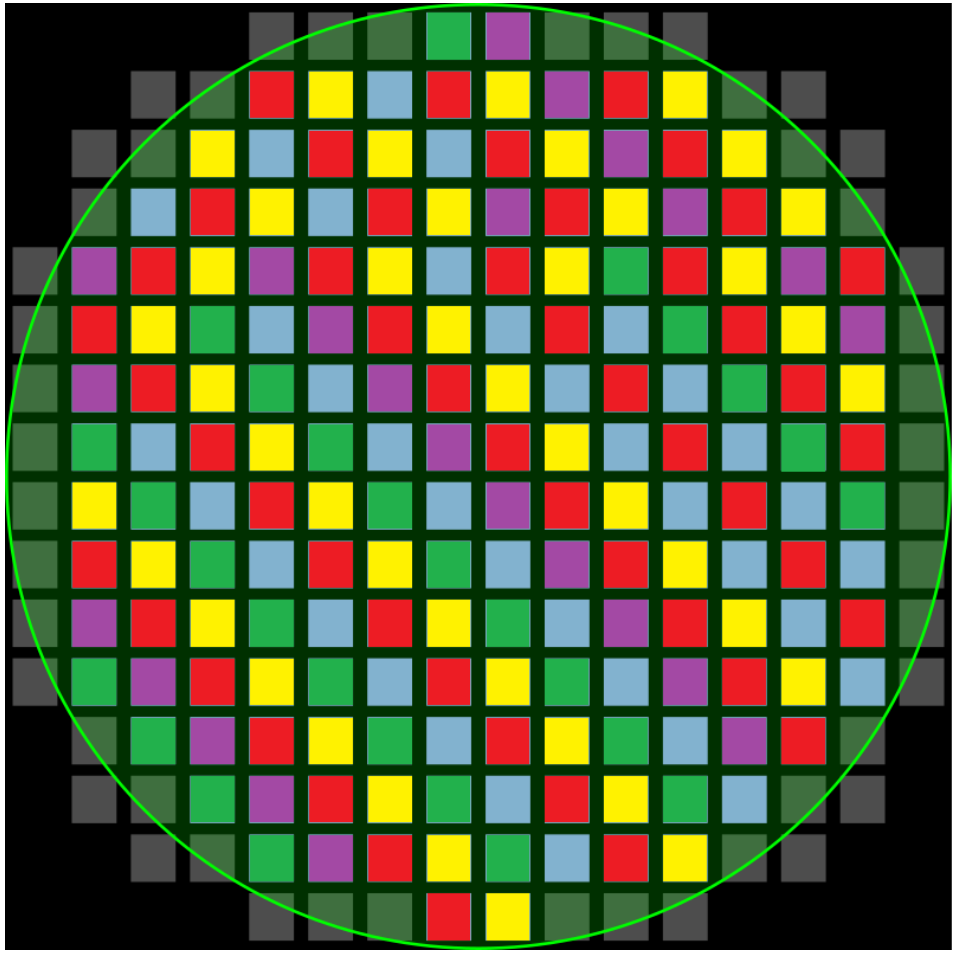
Although the free manufacturing rounds eventually ended, the MPW program itself continued, sustaining momentum within the open-source silicon community. Even without fully sponsored runs, designers remained engaged, motivated by the accessibility of the flow and the proven success of earlier shuttles.

The problem?

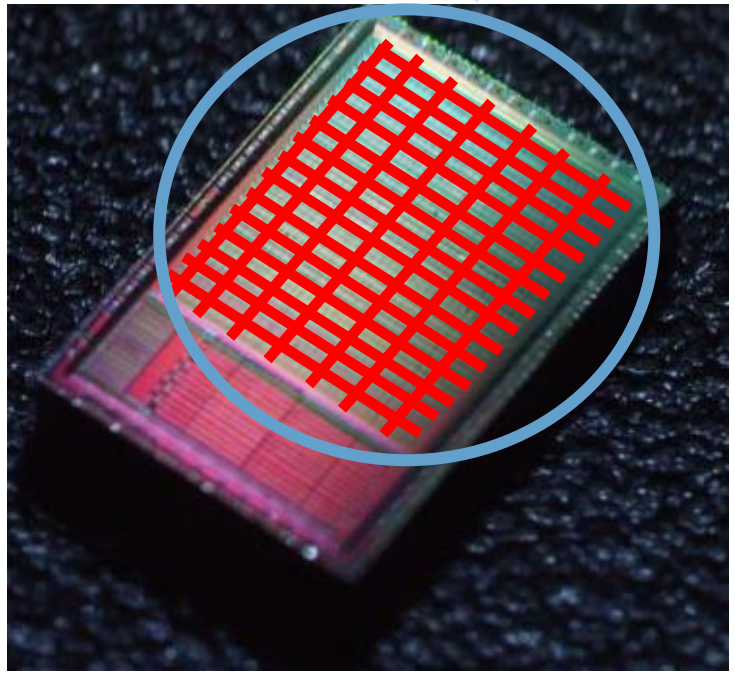
$10k – $15k USD





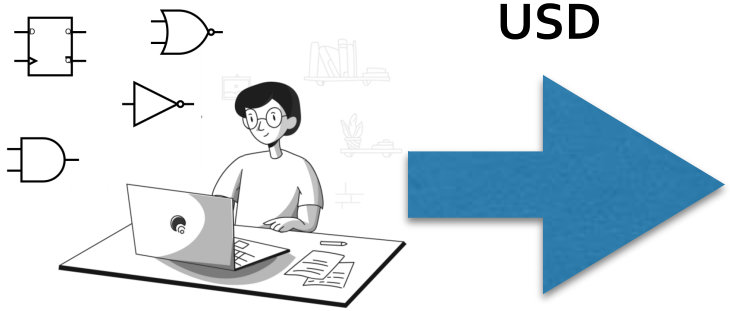


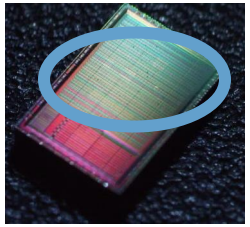
Although the free manufacturing rounds eventually ended, the MPW program itself continued, sustaining momentum within the open-source silicon community. Even without fully sponsored runs, designers remained engaged, motivated by the accessibility of the flow and the proven success of earlier shuttles.



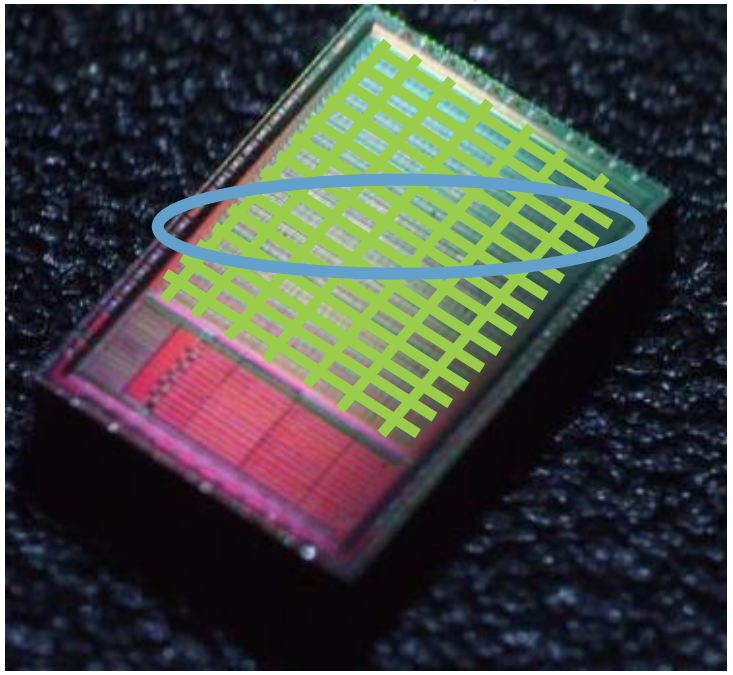
The problem?

$10k – $15k USD



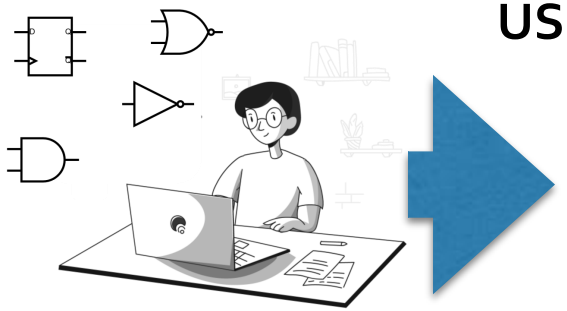


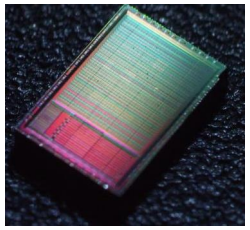
Although the free manufacturing rounds eventually ended, the MPW program itself continued, sustaining momentum within the open-source silicon community. Even without fully sponsored runs, designers remained engaged, motivated by the accessibility of the flow and the proven success of earlier shuttles.



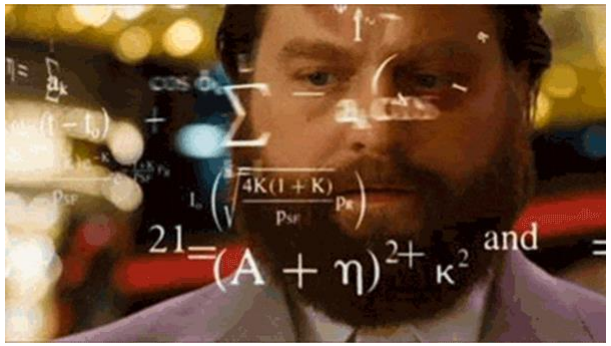
The problem?

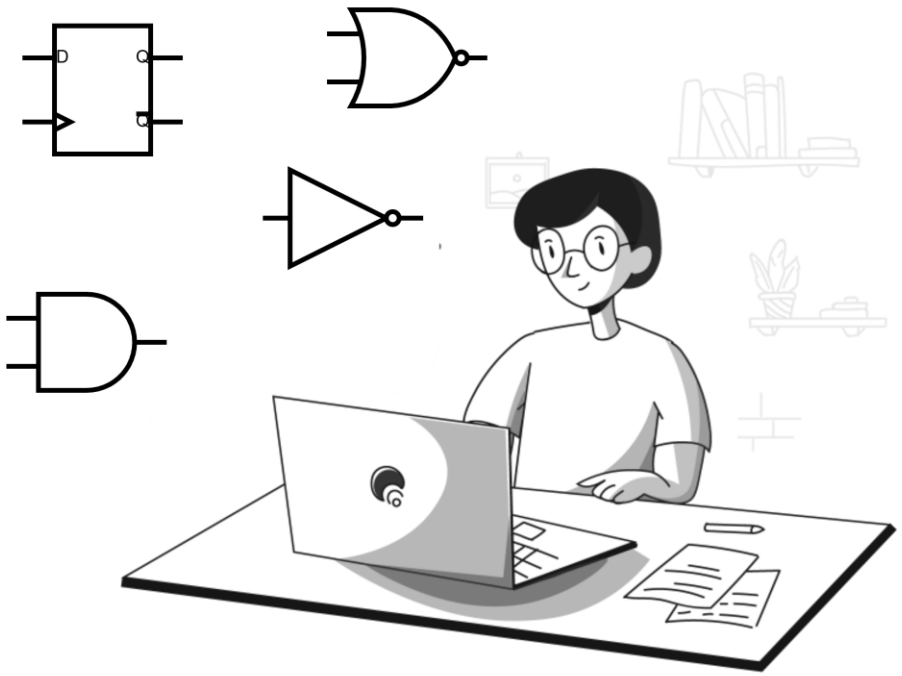
$10k – $15k USD

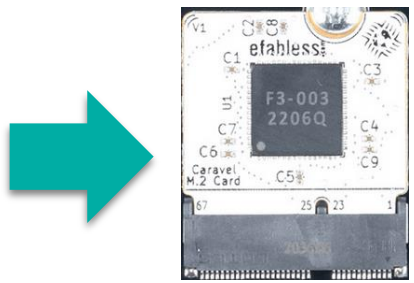


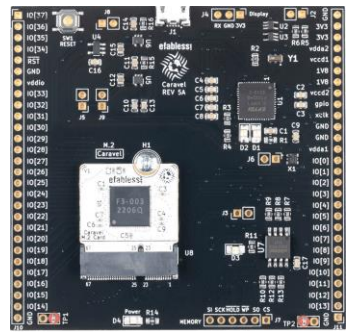


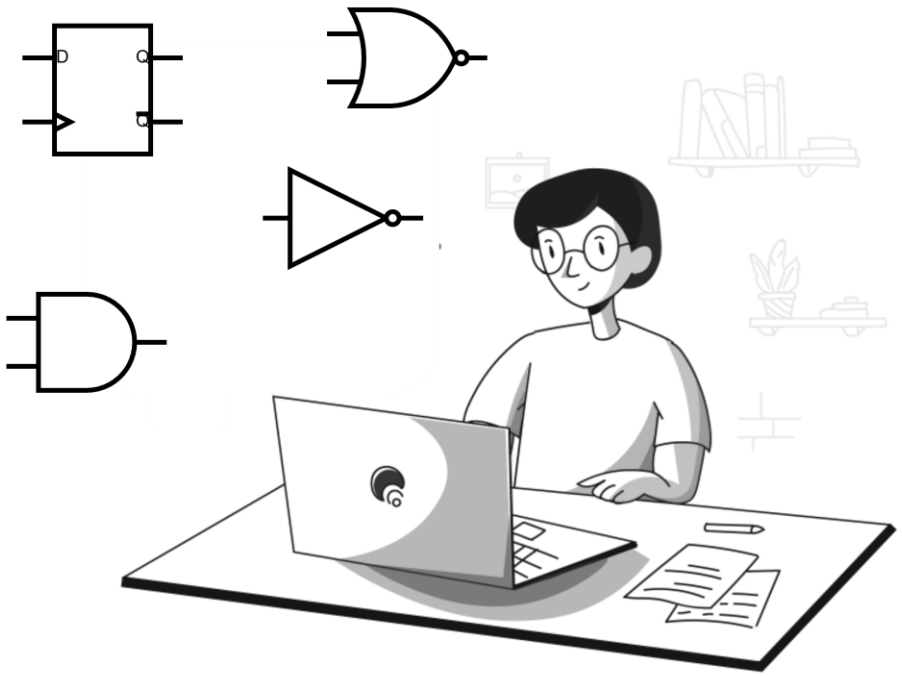
$10k/n-tiles USD

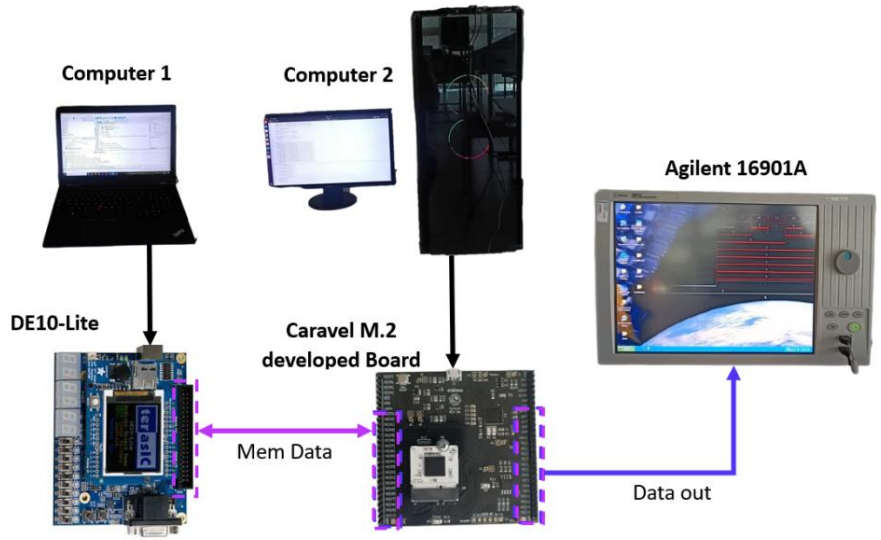




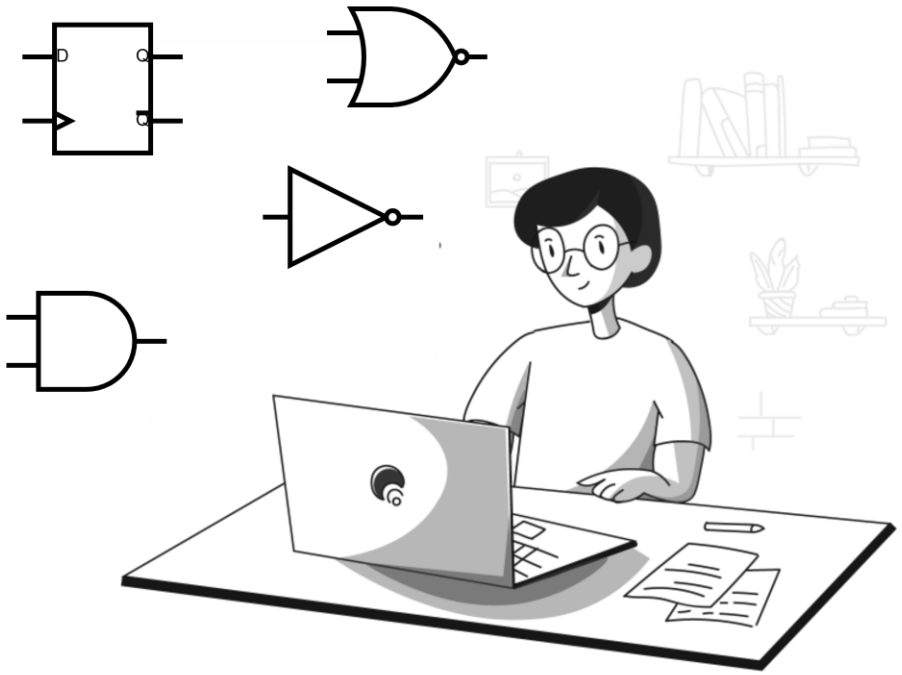

efabless
F3-003
2206Q
Caravel
M.2 Card

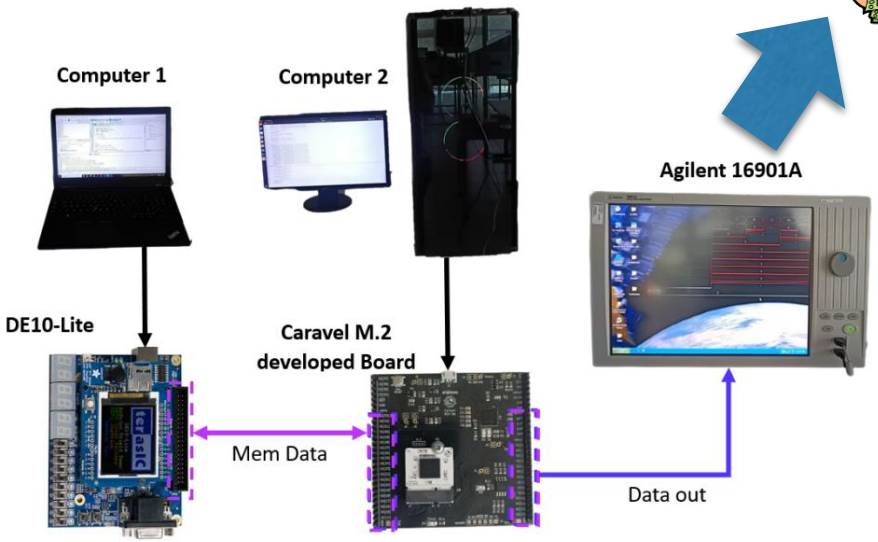






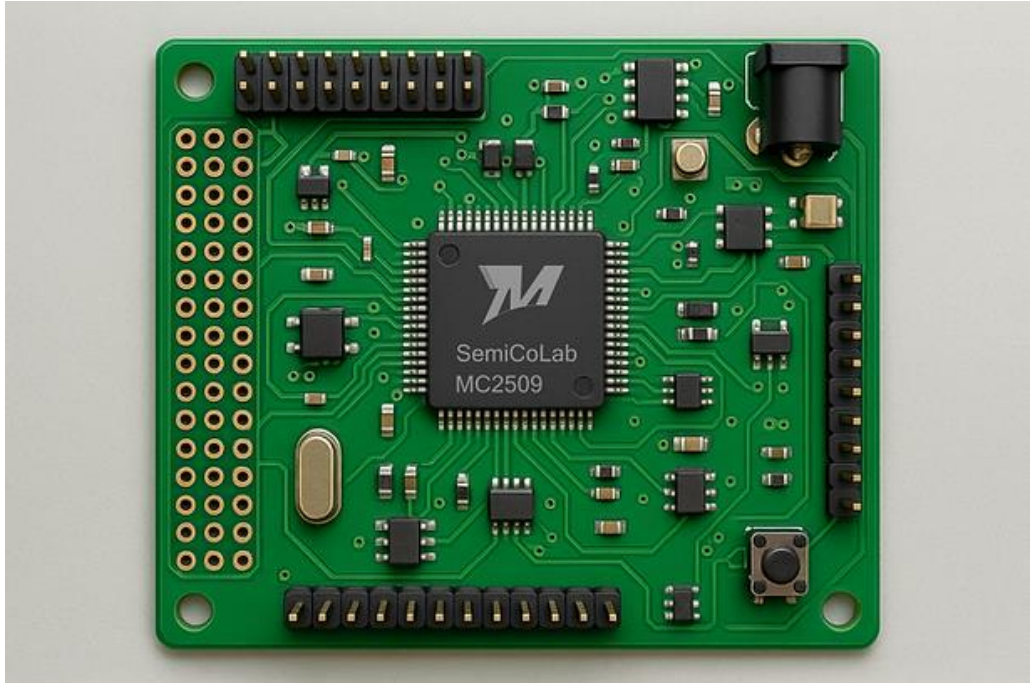
Process flow of the evaluation system using the DE10-Lite board, the Agilent 16901A Logic Analyzer, the Caravel breakout board, the Keithley 2200-30-5 power supply, and a computer to configure the devices.





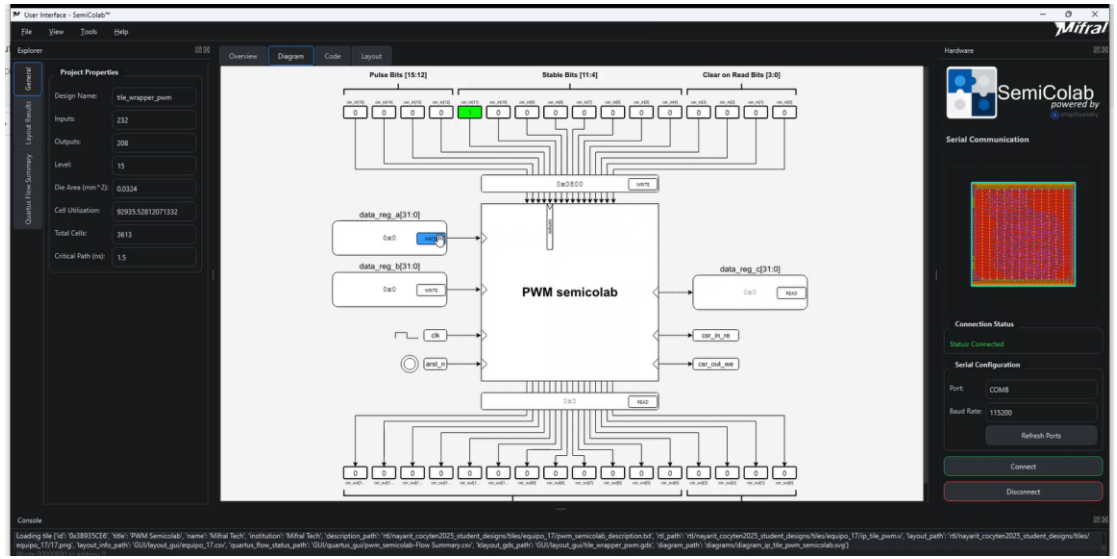
Process flow of the evaluation system using the DE10-Lite board, the Agilent 16901A Logic Analyzer, the Caravel breakout board, the Keithley 2200-30-5 power supply, and a computer to configure the devices.

SemiCoLab

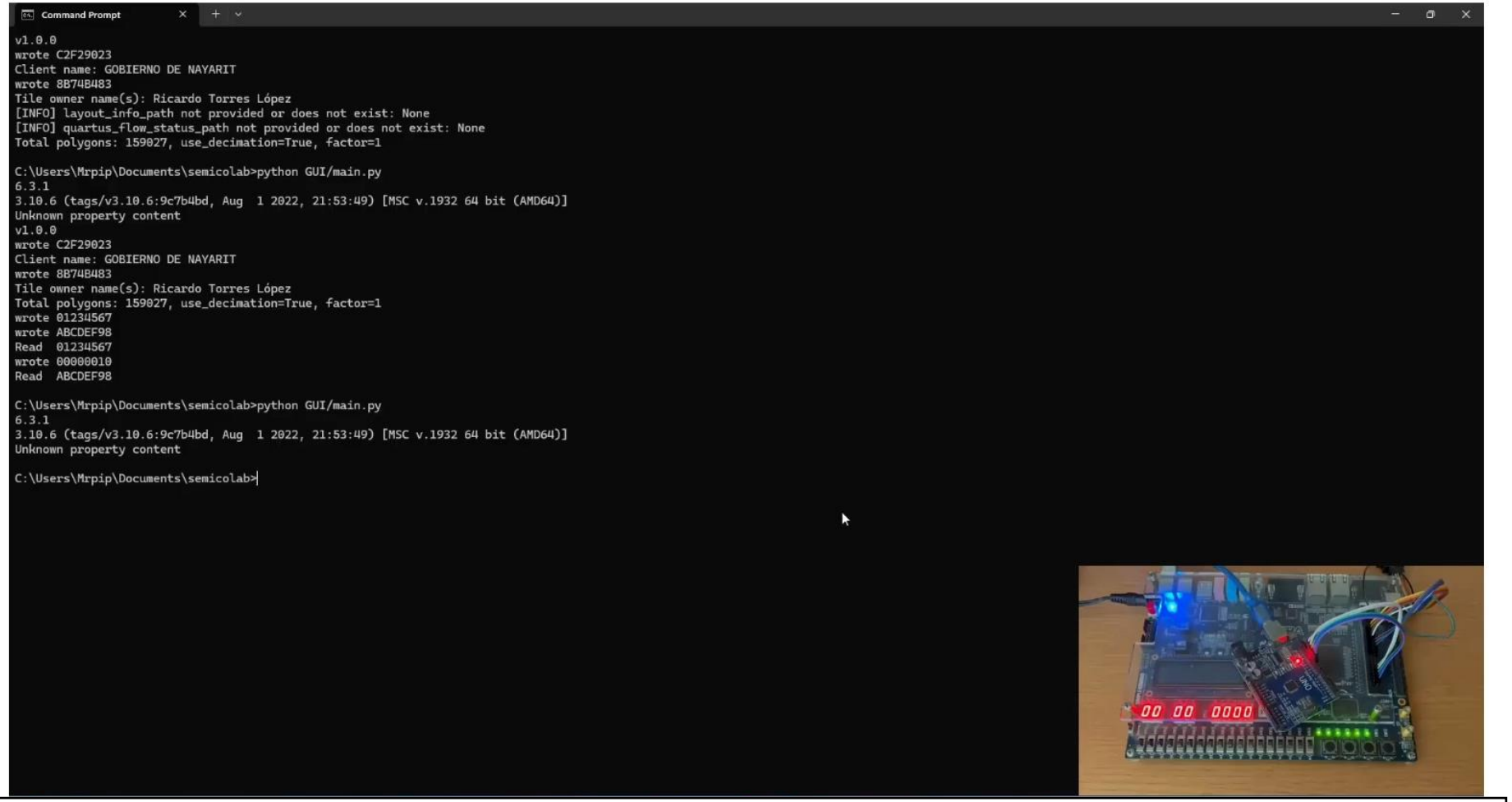


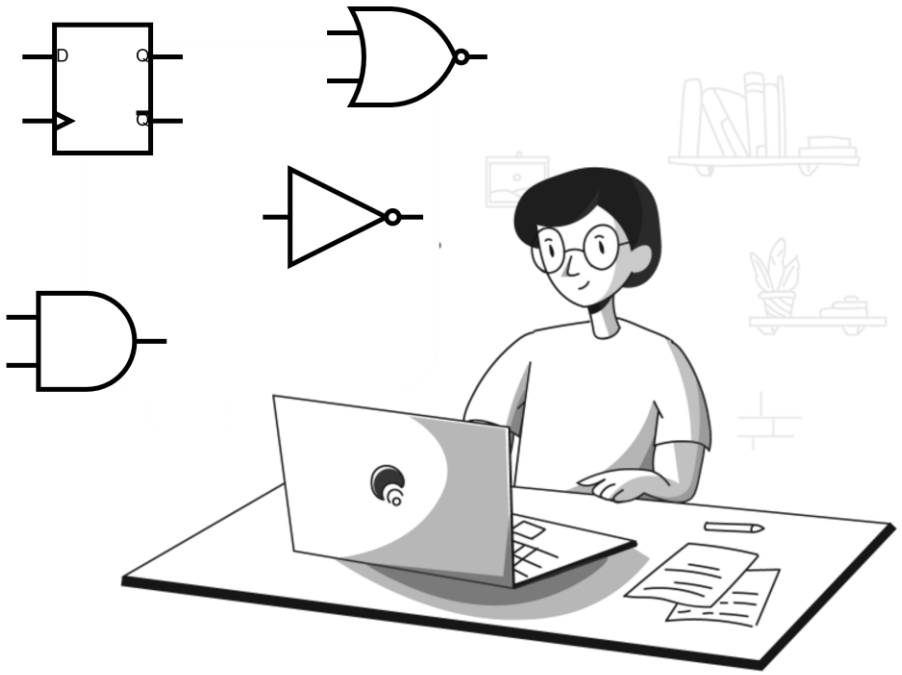
SemiCoLab is an educational and collaborative initiative designed to democratize access to the complete integrated-circuit (IC) design flow. The platform enables students, educators, and enthusiasts to create digital, analog, and mixed-signal systems using fully open-source EDA tools, and to manufacture them through a cost-shared Multi-Project Silicon (MPS) model that significantly reduces barriers to entry and accelerates practical learning.

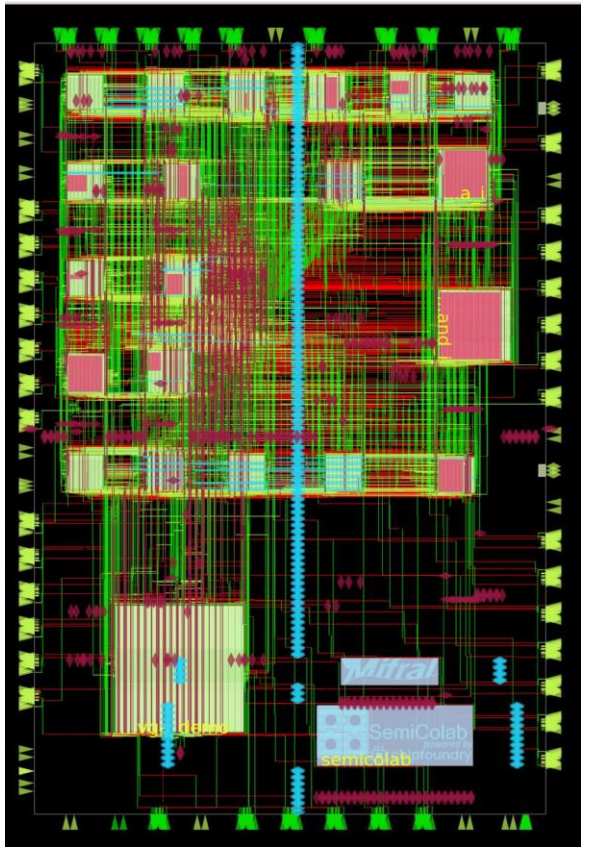
SemiCoLab



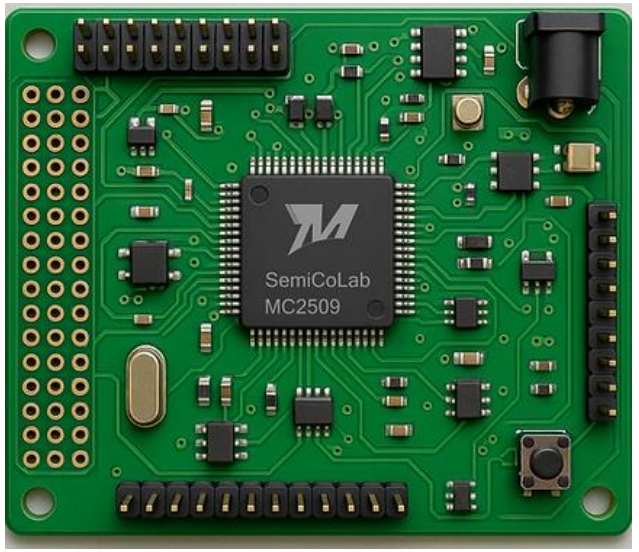
Unlike other academic chip-design programs, SemiCoLab includes a dedicated software environment for direct interaction, debugging, and functional testing of the fabricated systems—without requiring specialized laboratory equipment. This makes hands-on ASIC education more accessible, scalable, and aligned with modern semiconductor workforce needs.


Command Prompt
v1.0.0
wrote C2F29023
Client name: GOBIERNO DE NAYARIT
wrote 8B74B483
Tile owner name(s): Ricardo Torres López
[INFO] layout_info_path not provided or does not exist: None
[INFO] quartus_flow_status_path not provided or does not exist: None
Total polygons: 159027, use_decimation=True, factor=1
C:\Users\Mrpip\Documents\semicolab>python GUI/main.py
6.3.1
3.10.6 (tags/v3.10.6:9c7b4bd, Aug 1 2022, 21:53:49) [MSC v.1932 64 bit (AMD64)]
Unknown property content
v1.0.0
wrote C2F29023
Client name: GOBIERNO DE NAYARIT
wrote 8B74B483
Tile owner name(s): Ricardo Torres López
Total polygons: 159027, use_decimation=True, factor=1
wrote 01234567
wrote ABCDEF98
Read 01234567
wrote 00000010
Read ABCDEF98
C:\Users\Mrpip\Documents\semicolab>python GUI/main.py
6.3.1
3.10.6 (tags/v3.10.6:9c7b4bd, Aug 1 2022, 21:53:49) [MSC v.1932 64 bit (AMD64)]
Unknown property content
C:\Users\Mrpip\Documents\semicolab>

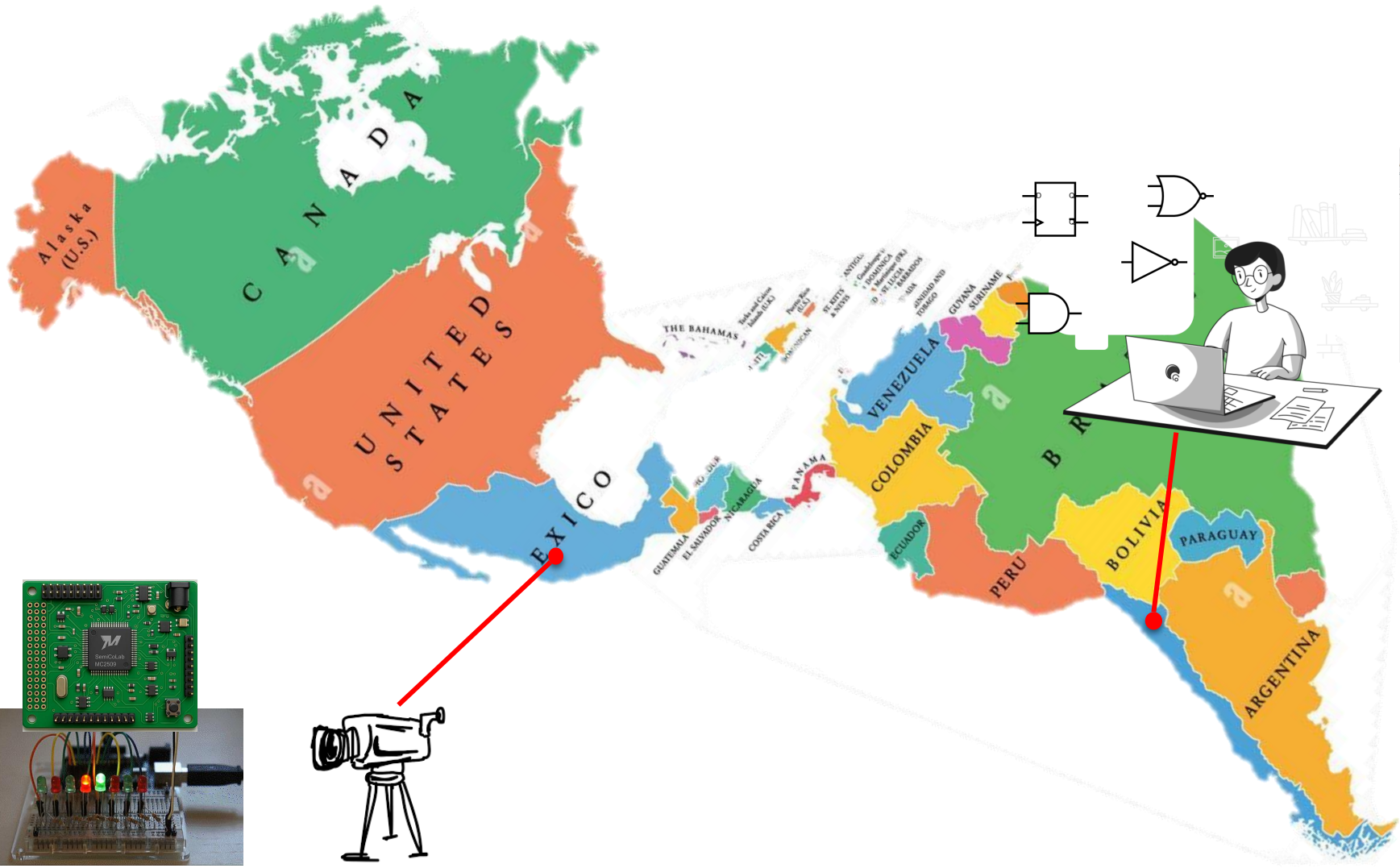


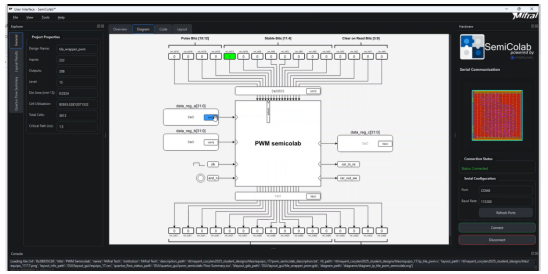


GDSII layout corresponding to the inaugural fabrication round of the SemiCoLab platform

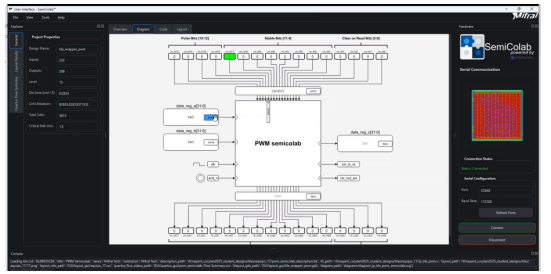


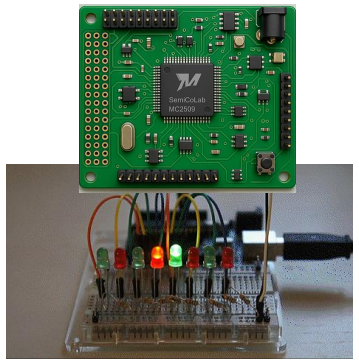
A user development board that enables seamless connection to a computer running the SemiCoLab software, as well as interaction with other external devices.


Alaska (U.S.)
CANADA
UNITED STATES
EXICO
THE BAHAMAS
GUATEMALA
EL SALVADOR
NICARAGUA
COSTA RICA
PANAMA
VENEZUELA
COLOMBIA
ECUADOR
PERU
BOLIVIA
PARAGUAY
ARGENTINA
GUYANA
SURINAME


PWM semicolab
SemiColab

Mifral





LinkedIn

SCAN ME

https://www.mifral.com/semicolab