



**MOTIUS**  
WE R&D.

## Silicon Case Studies

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November 19, 2025 20:31 (ccd1cd0)



# Silicon Case Studies

Our proven RISC-V projects demonstrate end-to-end capability from FPGA prototyping to manufactured silicon.

## **Game Engine Chip - Manufactured Silicon**

### **2022-2024 | Manufacturing Complete**

Our first custom chip - from FPGA prototype to 40 manufactured chips. The complete ASIC lifecycle.

[→ Read More](#)

## **Commercial RISC-V Platform**

### **2025 | Active Commercial Project**

Dual RISC-V CPU integration (Andes + Synopsys) for trade show demonstrator and reference platform.

[→ Read More](#)

## **eMil ML System**

### **2022-Today | Government-Funded Research**

Machine learning system optimization on RISC-V with custom FFT accelerator for edge processing.

[→ Read More](#)

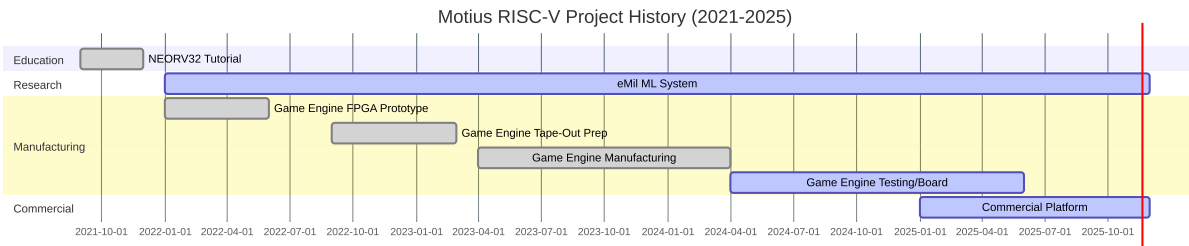
## **NEORV32 Tutorial**

### **2021 | Open-Source Contribution**

Custom CRC module integration tutorial for open-source RISC-V microcontroller.

[→ Read More](#)

# Project Timeline



# Project Summary

| Project             | Timeline     | Type          | CPU Core(s)           | FPGA Platform         | Status               |
|---------------------|--------------|---------------|-----------------------|-----------------------|----------------------|
| Game Engine Chip    | 2022-2024    | Manufacturing | Custom game engine    | AMD Artix-7 → Silicon | ✓ 40 chips received  |
| Commercial Platform | 2025-ongoing | Commercial    | Andes + Synopsys      | Kintex-7, Ultrascale+ | ↻ Active development |
| eMil                | 2022-today   | Research      | Western Digital EH1   | AMD Artix-7           | ↻ Ongoing            |
| NEORV32             | 2021         | Education     | NEORV32 (open-source) | AMD Artix-7           | ✓ Complete           |

# Key Achievements Across Projects

## Silicon Manufacturing

-  First custom chip designed and manufactured
-  40 working chips received in M.2 QFN package
-  Successfully debugged manufacturing defects
-  18-24 month real-world timeline experienced
-  Open-source manufacturing flow proven (Google/efabless)

## RISC-V Integration

-  3 different RISC-V CPU cores integrated
-  Andes commercial CPU (commercial client)
-  Synopsys ARC-V CPU (commercial client)
-  Western Digital EH1 (eMil)
-  NEORV32 open-source (tutorial)

## Custom IP Development

-  CRC module (NEORV32)
-  FFT accelerator (eMil)
-  Complete game engine (Game Engine - in silicon!)
-  All custom IP cores developed in-house

## FPGA Platforms

-  AMD Xilinx Artix-7
-  AMD Xilinx Kintex-7
-  AMD Xilinx Ultrascale+
-  Multiple board variants (Nexys A7, Arty A7, Genesys 2)

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