Codasip Studio™ Design and customization toolset

Codasip Studio is a unique collection of tools for fast and easy designing or modification of processors. Introduced in 2014, it is silicon-proven by major vendors. All-in-one, highly automated, Codasip Studio is perfect for you to efficiently and cost-effectively customize an existing Codasip® RISC-V processor or design your own processor from scratch.

Benefits

→ Comprehensive processor description
→ Description in familiar C-based language
→ Fully automated SDK generation
→ Analyze software using in-built profiler
→ Clean, human-readable RTL generated
→ Automatically generated verification environment
→ Fully automated design flow

Codasip Studio is based on open standards and tools such as Eclipse, LLVM, Verilog, SystemVerilog, and UVM to ensure compatibility and longevity.

Our technology foundation

With Codasip Studio, automate processor design and development by using a single description of the processor capabilities. The description is written in CodAL™, a high-level processor description language similar to C. Everything needed to implement, verify, and write software for the processor is generated from the CodAL description automatically.

Better, unique PPA

Codasip Studio adds domain-specific instructions natively into the processor pipeline and features powerful high-level processor synthesis technology. The performance of generated processors exceeds hand-optimized designs.

Codasip Studio’s advanced profiling capabilities allow for analyzing the application code to determine potential optimizations and achieve the best possible PPA.
Rigorous verification

Strong verification methodology employed by Codasip Studio combines a standardized approach, simulation, and static checking for reliable results.

Codasip Studio provides a consistency checker, random assembler program generation, and an automatically generated UVM environment.

UVM allows the generated RTL for your processor to be checked against your instruction-accurate reference model. Multiple model formats are available to ensure that at each step of the verification, you have the best trade-off between viability and performance. From virtual prototyping to detailed system debug, Codasip Studio generates the models you need.

Customer examples

Equalization algorithms for audio processing

Design exploration in Codasip Studio suggested starting with RV32I instructions and extending the set with M and custom DSP instructions:

→ Final result 56.24× throughput of original design
→ Gatecount 2.43× greater than original design
→ Codesize 3.62× smaller than in original design
→ Significant saving in mask-making costs by targeting older coarser technology node

Quantum-resistant security for low resource devices

Accelerating a digital signature algorithm was achieved by adding one instruction to a Codasip RISC-V Processor:

1. Final result 2.8× faster than the original design
2. Gatecount 1.02× greater than original design
3. Codesize 1.32× smaller than in original design

Processor for a unique AI compute platform

To achieve low power AI computation in a compact chip, Codasip Studio added custom extensions to a Codasip RISC-V processor (B, DSP, zero-overhead loops, and coprocessor interface instructions) to perform:

→ General purpose tasks
→ Domain specific tasks
→ Offloading part of the DSP work

Ways to use Codasip Studio

Codasip Studio is both powerful and versatile, enabling you to use it in a way that best suits your needs:

1. Getting started is easy when you select any of our ready-made Codasip RISC-V Processors as a quick- start base for your own custom design.

2. You can also start from scratch and create a fully custom processor of any type (RISC, CISC, VLIW, DSP and others).

3. You can optimize your existing core described in CodAL, too.

4. Or you can use Codasip Studio just for painless maintenance of your legacy proprietary processor’s SDK.

Happy customers include