# Generative AI for Chip Design

## A Comprehensive Learning Resource Collection

### ■ Who This Is For

This collection of training modules is designed for those from relevant backgrounds who want to understand how artificial intelligence is revolutionizing computer chip design. Whether you are a high school student exploring STEM fields, an undergraduate student in EE/CS/CE or any other STEM field, an educator in the relevant fields, a professional chip designer interested in AI applications, these materials will guide you.

### ■ What You'll Discover

Explore how Large Language Models (LLMs) are being used to automatically design computer chips. You will learn about how to convert software code to hardware designs, generating computer circuits from natural language descriptions, creating tests for chip validation, and much more.

### ■■ Time Investment Guide

| Material Type | Time Commitment | Best For |
|---|---|---|
| Quick Overview (This Document) | 5 minutes | Getting oriented |
| Interactive Tutorials (Colab Scripts) | 30-90 minutes each | Hands-on learning |
| Research Papers | 20-45 minutes each | Deep understanding |
| Presentation Slides | 15-30 minutes each | Visual learners |
| Video Presentations | 45-60 minutes each | Comprehensive overview |
| Complete Collection | 40-45 hours total | Thorough exploration |

### ■ Featured Research Areas

• LLM4Verilog: Automatic generation of Verilog using LLM
• LLM4Validation: Automatic generation of SystemVerilog assertions & testbench files using LLM
• LLM4Security: Automatic detection of hardware security risks using LLM
• LLM4HLS: Automatic High-level Synthesis for C codes using LLM
• LLM4Analog: Automatic generation of analog circuit netlists from schematics.

### ■ Getting Started

Begin with the interactive tutorials in the 'colab-scripts' folder - these are designed to run in your web browser without any software installation. Each tutorial includes step-by-step explanations and real examples. The README.md file provides links to all papers, code repositories, and additional resources. Don't worry if some technical terms are unfamiliar at first - the materials are designed to build your understanding progressively.