

# DHANASANKAR K

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## ASPIRATION

Motivated and detail-oriented fresher with a strong interest in VLSI, analog, and digital design. Gaining hands-on experience in Verilog for digital circuits and building core skills in analog concepts like device modeling and biasing. Quick learner with strong analytical thinking, eager to contribute to real-world mixed-signal projects in a dynamic semiconductor environment.

## EDUCATION

- **B.E in Electronics and Communication Engineering**, Government College of Engineering, Erode **2021 – 2025**  
CGPA: 7.6
- **Higher Secondary Education**, Gandarvakkottai, Pudukottai (State Board) **2021**  
Percentage: 76.8

## TECHNICAL SKILLS

- **Area of Interest:** Digital Design
- **FPGA Platforms:** DE2-70 (Altera Cyclone II), Artix-7 (Xilinx)
- **Programming:** C (basic), Python (image processing and visualization)
- **HDL:** Verilog
- **Simulation Tools:** Icarus Verilog, Xilinx Vivado 2019.1
- **Analog Design Tools:** LTspice,
- **Off-chip Protocols:** UART, SPI, I2C
- **OS:** Ubuntu Linux

## INTERNSHIP EXPERIENCE

- **TechVolt Pvt. Ltd, Coimbatore** - Embedded Systems and IoT **Jun – Jul 2023**
  - Gained hands-on experience in microcontroller programming and IoT development.
  - Interfaced sensors and actuators using ESP8266, ESP32, and NodeMCU boards.
  - Built real-time data acquisition systems with Arduino and NodeMCU for temperature, humidity, and motion sensing.
  - Explored MQTT and HTTP protocols for cloud-based IoT communication and dashboard integration.
- **Silicon Craft VLSI Training and Research Institute, Chennai** - VLSI Intern **Jul – Aug 2024**
  - Worked on digital design concepts including logic gates, multiplexers, decoders, and flip-flops using Verilog.
  - Simulated RTL code for combinational and sequential circuits using Icarus Verilog and GTKWave.
  - Contributed to the development of a secure digital voting machine project including counters and control logic.
  - Understood the basics of FPGA design flow, testbench creation, and waveform-based debugging.
- **Silicon Craft VLSI Training and Research Institute, Chennai** - Design Verification Trainee **Feb 2025 – Present**
  - Gained in-depth knowledge of digital circuit design concepts including combinational and sequential logic blocks.
  - Explored digital design by writing and simulating Verilog RTL code for counters, FSMs, and data paths.
  - Practiced RTL-to-gate-level synthesis flow and debugging techniques using industry-standard tools.
  - Understood and implemented core communication protocols such as UART, SPI, I2C, and APB for chip-to-chip and peripheral communication.

- Designed and simulated testbenches to verify an APB-to-I2C bridge and ensured correct protocol-level handshaking and data flow.

## MAJOR PROJECTS

### • Real-Time Image Processing on FPGA

- Designed Sobel edge detection and 46 real-time image filters in Verilog for grayscale image processing.
- Integrated VGA display output and SDRAM buffering for real-time frame rendering.
- Implemented filters such as median, Gaussian, inversion, and morphological operations using case-based selection.
- Simulated and verified functionality using Icarus Verilog; visualized output using Python Matplotlib for pixel accuracy.

### • I2C Master-Slave Communication

- Implemented I2C protocol using finite state machine (FSM) logic in Verilog.
- Developed modules for START/STOP condition, address phase, read/write control, and ACK/NACK handling.
- Designed and simulated master-to-slave data transfer with customizable address configuration.
- Verified functionality using waveform analysis in GTKWave, confirming signal timing and protocol correctness.

### • UART Loopback Communication System

- Designed and implemented a UART-based communication system with a transmitter, receiver, and return transmitter using Verilog.
- Created FSM-based control logic to transmit data from UART TX to RX and echo the received byte back using second TX.
- Verified functionality with testbench simulation, observing correct data transfer and return using GTKWave.
- Demonstrated the full-duplex loopback mechanism and validated data integrity between multiple UART modules.

## ACADEMIC PROJECTS

### • Dual Axis Solar Tracker

- Developed a solar tracking system to align panels with the sun's movement using dual-axis rotation.
- Enhanced energy efficiency by continuously optimizing panel orientation based on real-time light intensity.
- Implemented LDR (Light Dependent Resistor) sensing and servo motor control logic using Arduino.
- Designed and debugged the embedded control algorithm for automatic solar panel alignment.

### • Color-Based Product Sorting

- Built an automated sorting system using TCS3200 color sensor and servo-based diverter mechanism.
- Programmed the system to detect object color and classify items into specific output bins.
- Utilized Arduino microcontroller for sensor interfacing and actuator control logic.
- Demonstrated application in industries such as food processing, recycling, and packaging.

## CO-CURRICULAR ACTIVITIES

- **Achieved Rank 1 on HDLBits:** Solved all digital design problems on the HDLBits platform using Verilog and organized all solutions in a dedicated GitHub repository.
- **Extensive Coding Practice:** Practiced numerous digital design problems in Verilog, creating well-structured GitHub repositories with topics organized by module, testbench, and functionality.

## SOFT SKILLS

- Debugging    • Schematic-reading    • Time-management    • Circuit-troubleshooting    • Problem-solving
- Communication    • Team-collaboration    • Decision-making