The AXI bus works on the burst-based communication system and it has 5 independent channels for the transactions. The control and address data are transmitted from the master to the slave before the data burst. The AXI transactions are performed with the help of a regulator. The testbench is using variable re usable components to do the tasks.

### Introduction

A great American businessman, Mr. Gordon Moore, once predicted the growth in electronic circuits. He stated that the number of transistors on an IC will double every eighteen months. As the number of transistors increases, the system tends to become more complex. In today's age, there are approximately 10 billion transistors embedded in a single square inch of an IC.

### Methodology

#### DESIGN UNDER TEST (DUT)

The AXI bus works on the burst-based communication system and it has 5 independent channels for the transactions. The control and address data are transmitted from the master to the slave before the data burst. The master sends the read response signal after the completion.

- **AXI Write Address Channel**
- **AXI Write Data Channel**

#### Verification Scheme

The results of the simulation are discussed below. The transaction starts from the driver sending signals to the DUT. The sequence is generated from the uvm_sequence class. For purpose of simulation, two memories were created using an associative array. One memory acted as master and others acted like a slave. Data from the random memory location of the master was copied and sent the data at the random memory location of the slave and later the data at the slave was read to check if it was transferred correctly. Some of the simulations went correct while some simulations faced errors. Some of those screen captures are mentioned below.

#### Analysis and Results

In some cases, the data received from the slave didn’t match the data that was transmitted. That is the case where UVM throws an error. Sometimes it fails to read from invalid memory of slave which is also an error. Below are the figures for such errors.

### Acknowledgements

We would like to extend our gratitude towards our project advisor, Dr. Lili He, for all the coordination and support provided by her. A special thanks to our co-advisor Prof. Morris Jones for helping us in the process of choosing our project topic and also making us capable of completing the project by educating us via his lectures. We are thankful to San Jose State University for providing us with all the amenities that aided us in completing the project.

### Key References