

The University of Texas at Dallas
Dept. of Electrical and Computer Engineering

EEDG/CE 6303: Testing and Testable Design

HW # 1: Due on Tuesday 1/30/2024 - 11:59 pm (US CST) - Submission only through Elearning

When you submit any report, please comply with the following guidelines carefully:

- *Have the **cover page** (provided in the course webpage in Elearning) for each document (e.g. homework, project, report, etc.) that you submit. Fill all information that include: (1) your name as it appears in your **student ID card**, (2) course name/number, (3) homework/project number, and (4) the **Statement of Academic Honesty** that you sign.*
- *Make one single PDF file for your report (with the signed cover page be the first page) and then upload it before the deadline. Note that multiple attempts are allowed but only the last one will be graded.*

1. Read the article titled: Toyota Case: Single Bit Flip That Killed (available in <https://www.eetimes.com/toyota-case-single-bit-flip-that-killed/>). In at most one page, comment how circuit/system testing may prevent such scenarios.
2. The design and analysis (test, assessment) of electrostatic discharge (ESD) protection circuits are critical for integrated chips (IC) reliability. For IC device testing using traditional methods, various ESD pulses are applied and the analysis of their behavior (e.g., current-voltage (IV) curves) is observed to ensure reliability.

Search the Internet to find an article on **ESD stress assessment/testing** in integrated chips. One source is the electronic databases in the UTD McDermott library (<http://www.utdallas.edu/library>). In your search, relevant keywords/phrases include: pre- and post- ESD stress analysis, IV curve tracing/shift, human body model (HBM) versus charged device model (CDM), testing high-speed interfaces Transmit (TX) and Receive (RX) pins, device characterization with transmission line pulse (TLP).

In at most three pages, (i) summarize the key part of the paper (e.g. model, methodology, results), (ii) explain your own opinion on using statistical analysis (that is the foundation of machine-learning approaches) for ESD stress assessment. Attach the article that you found to your report.