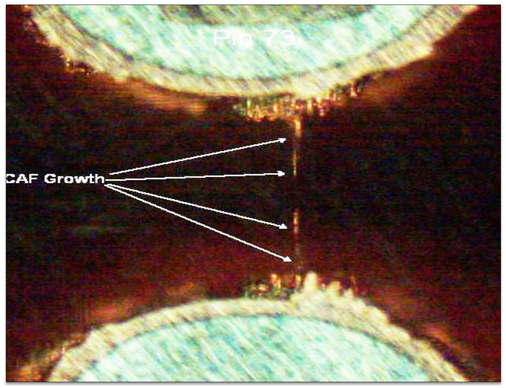
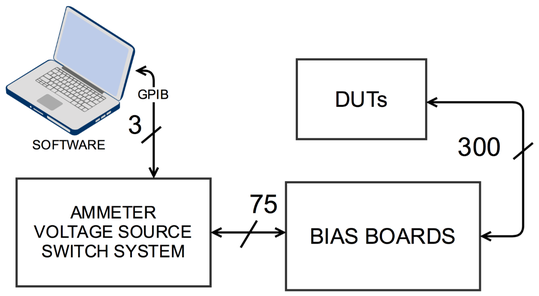
Intel CAF Tester Development

Background

- Intel aims to keep platforms for seven years or more, so they need to understand how small changes affect the lifetime of a product.
- A conductive anodic filament (CAF) is a conductive copper filament that forms in the dielectric material between two adjacent conductors in a printed circuit board (PCB).
- Need accelerated test environment, which includes high temperature, humidity, and voltage to model CAF failures over long periods of time.
- New PCB designs require tighter spacing between traces and vias, which increases the likelihood of CAF failures.
- Testing requires many devices as manufacturing and material variations will occur.



CAF Growth



Test Set-Up

Project Description

Intel would like to upgrade their current CAF testing system's hardware and software. The software needs to be upgraded to the MATLAB platform, and the hardware needs to be redesigned to ease test set up time.

Project Impact

Overview	Before	After
Number of laptops required	3	1
Test setup time	8 hrs	1 hr
Required wire connections	600	75
Post test data processing	40 hrs	0 hrs
Software Features		
Pause test	no	yes
Show failure at a glance	no	yes
Data collection rate adjustment	no	yes
Data accessibility	Once Every 24 hrs	Any-time
Continue from previous test	no	yes

Comparison Between Set-Ups

Deliverables

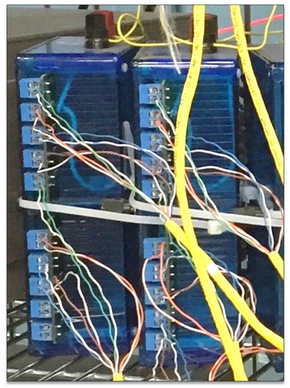
Software:

- Upgrade software from Visual Basic 6.0 to MATLAB 2015a
- Implement new features

Hardware:

- Redesign "bias" boxes
- Simplify test and decrease set-up time

Results



Previous CAF Set-Up

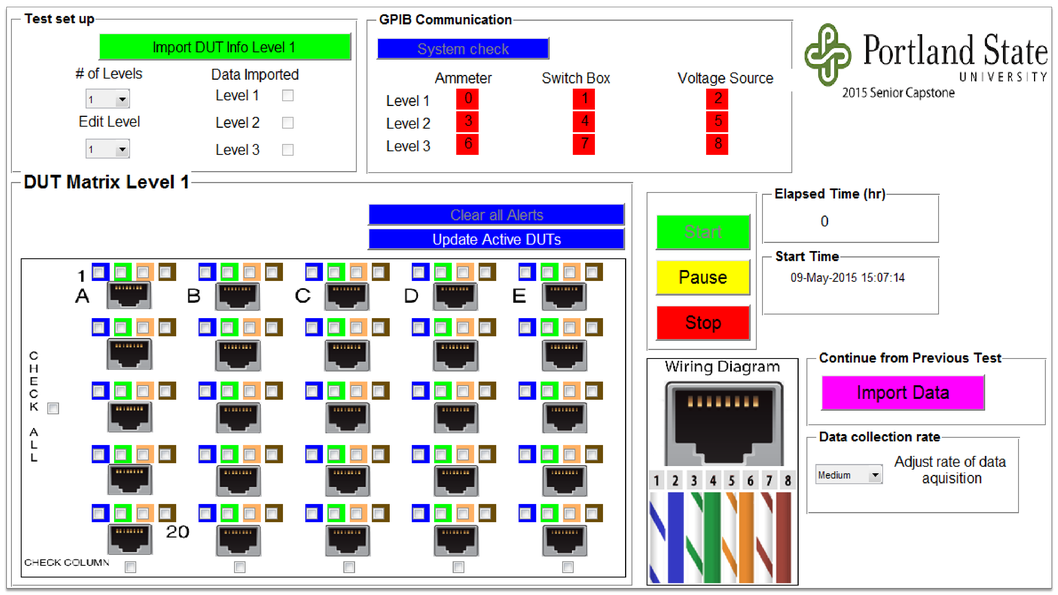
New CAF Set-Up

Previous CAF Set-up

- Looked like a rats nest
- Time consuming setup (**8+ hrs**)
- Required 600 screw terminal connections

New CAF Set-up

- Easier wiring scheme – reduces set up time by **90%**.
- Compact design - new CAF setup requires only 75 Ethernet connections for one test



Upgraded MATLAB GUI

- GUI is user friendly, intuitive, and easy to maintain
- GUI is designed to match the physical interface of the new test setup
- Software compiles and handles **millions** of data points over **thousands** of hours
- **Previous** software only output time, current, and resistance. All other columns of data had to be **manually** populated, which required **40 hours** of processing

Team Members

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