


Portland State
UNIVERSITY

# ROBOTIC HANDLER FOR SOCKETING AND DE-SOCKETING CPU ON A MOTHERBOARD

Portland State University Capstone Project Proposal

September 28, 2016

# Background

Intel Quality and Reliability team has built and developed a reference system that we placed in our Customer site

- The reference system is an Intel reference design motherboard with several attachments and features added
- For a suspected failing unit, the customer can put it in Intel test system to verify the failure before sending it back to Intel
- Intel keep on adding improvements to automate the testing as much as possible, in which the latest generation only require several mouse clicks to run the functional and electrical testing automatically

# Problem

The feedback that Intel got from the customers is that in order for them to adopt our test system, it would require an extra headcount for the system

- An operator is needed to put a CPU on a board, run a test and wait until it is over, then remove the CPU and place a new one
- Most of the time, Intel would be the one paying for a contract worker to be placed at the customer site

# Proposed Solution

Automate the socketing and de-socketing process of a CPU from a tray into a motherboard and back to the tray

- The automation should work in sync with the tests sequence that are already in place in the system, when the test is running and when the test is over
- The heat sink on top of the CPU would need to be modified
- The team would work remotely with one of the engineer in Malaysia that is responsible in the design of the heat-sink

# Project Deliverables

A robotic handler that can:

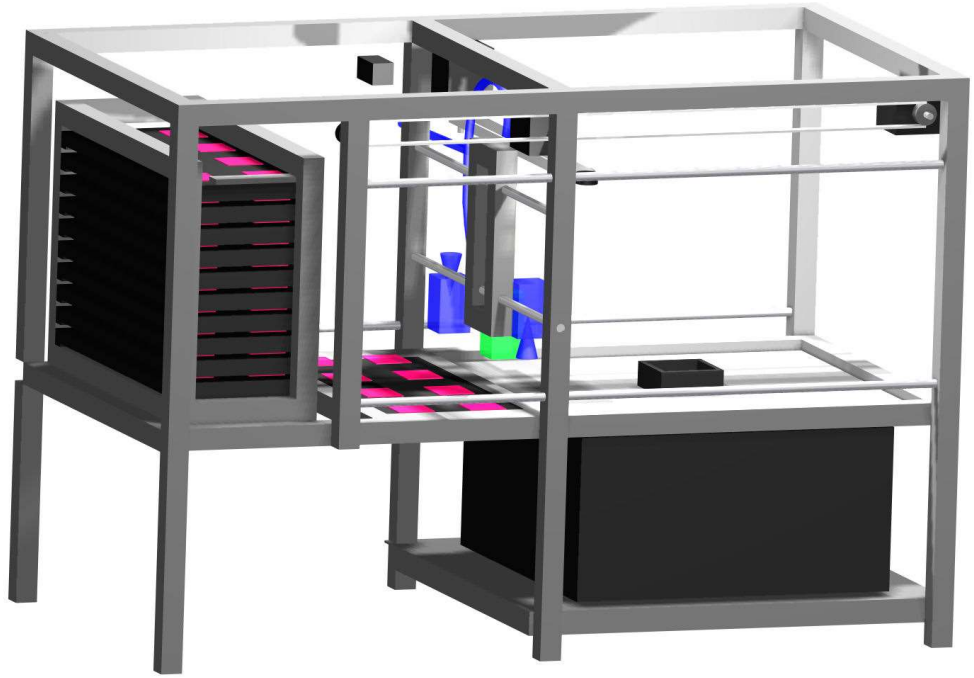
- Be loaded with trays of CPU
  - Two separate (stack of) trays, one for the good units and the other for bad units
- Take photos (top and bottom) of the CPU to check for physical damage
- Socket the CPU into a motherboard
- Wait for the test to be running and recognize when it is over
- Return the CPU into a tray
  - A good CPU back into its original tray, a bad CPU goes to the bad CPU tray
- Repeat the process

# Skills

This project would involve a team of engineers knowledgeable in software, electronics, and mechanical engineering

- Able to work with engineers from different disciplines
- In addition to the local Engineers, the team would also need to be able to remotely work with Intel Engineers located overseas with different time zones

# Concept Drawing



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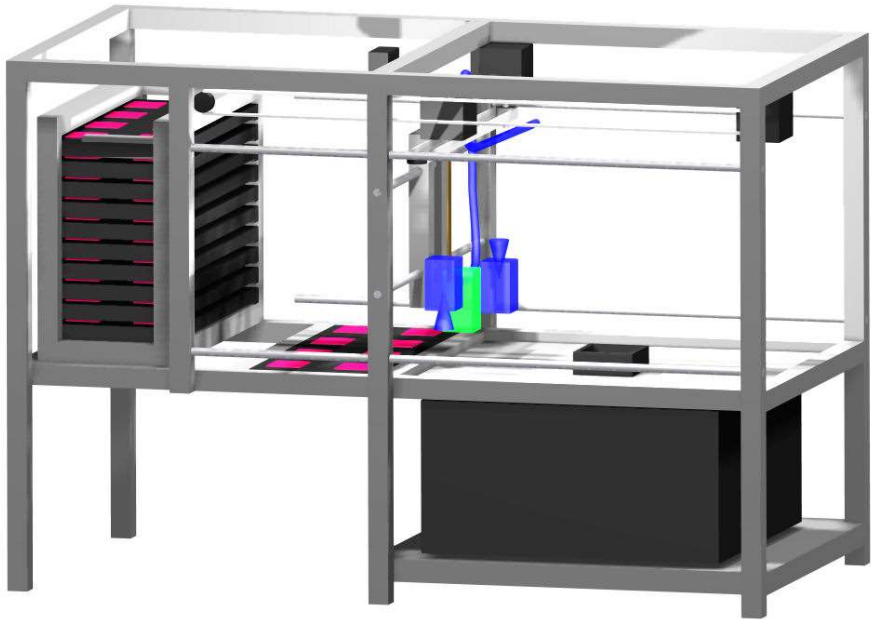

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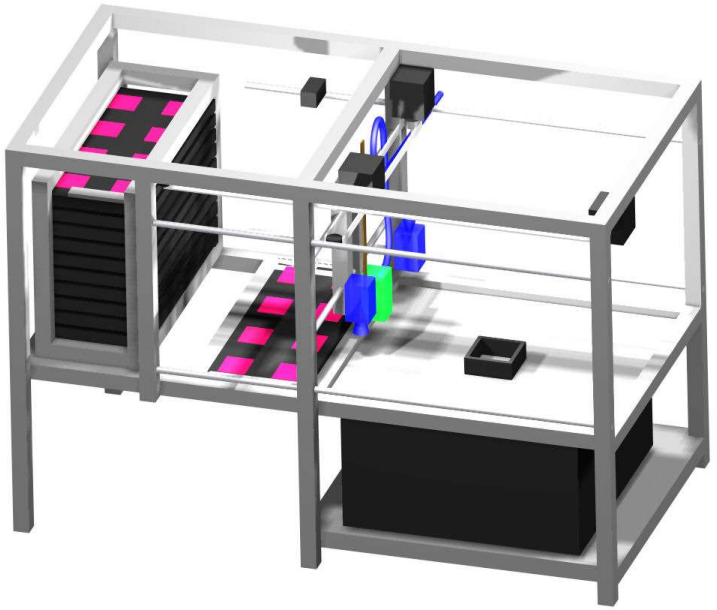

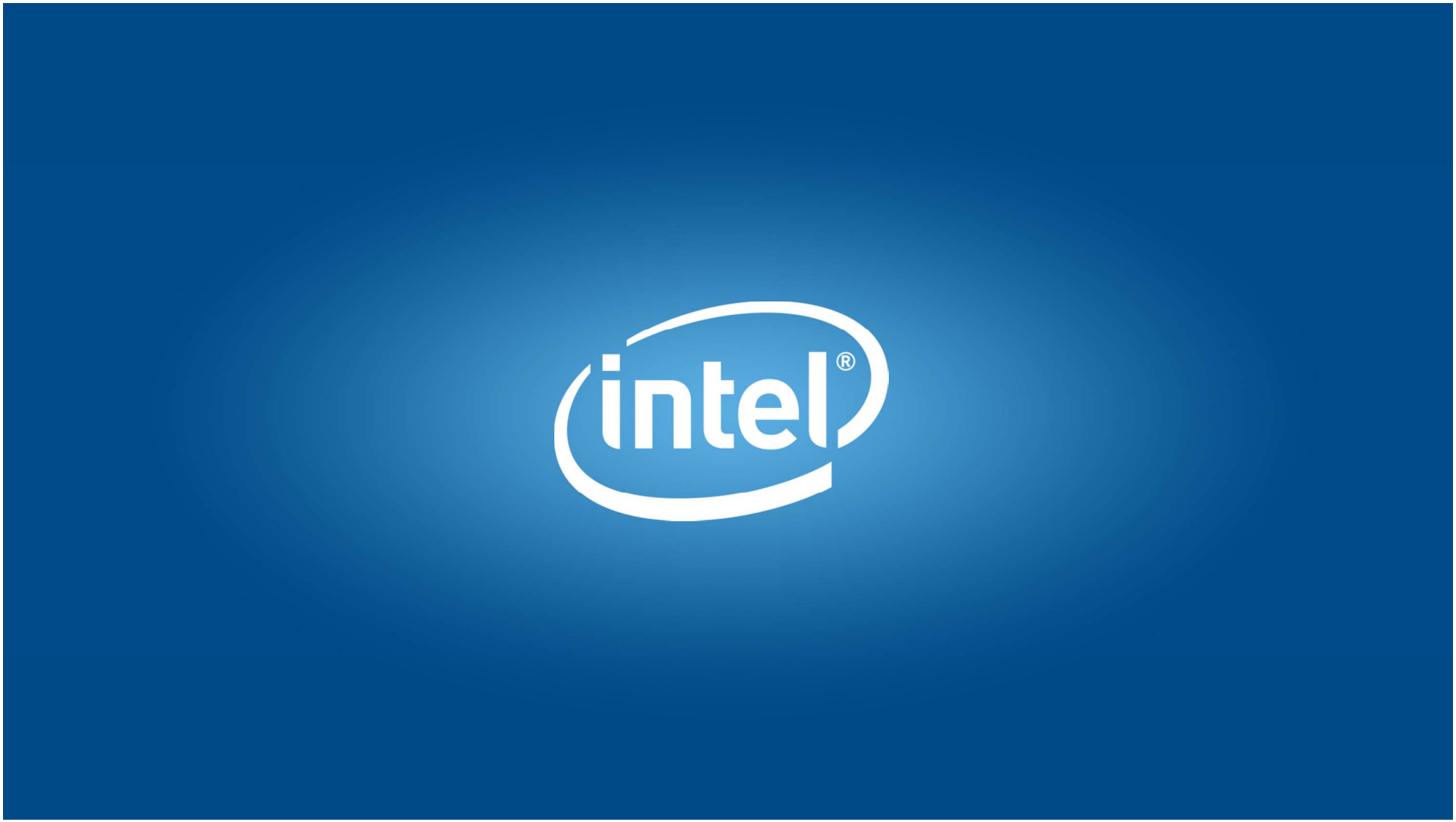
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