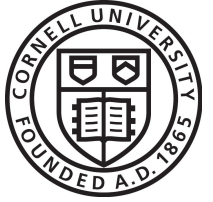


TFPX Mini Workshop

TIM deposition and module placement

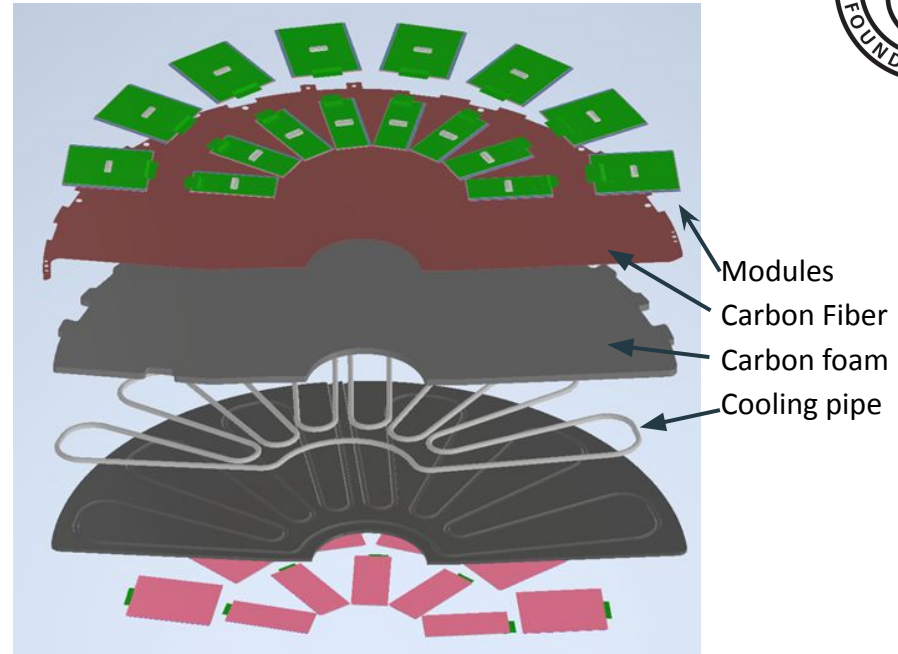
Sterre Hoogendoorn, Cornell University
February 8th, 2024

Outline



Process:

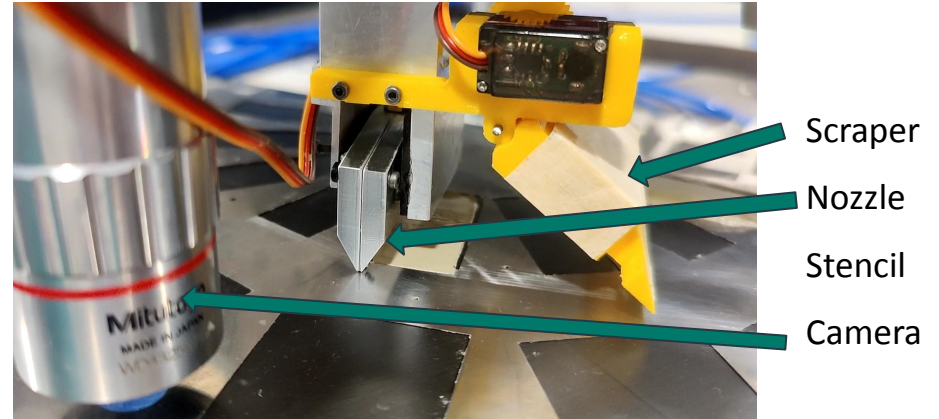
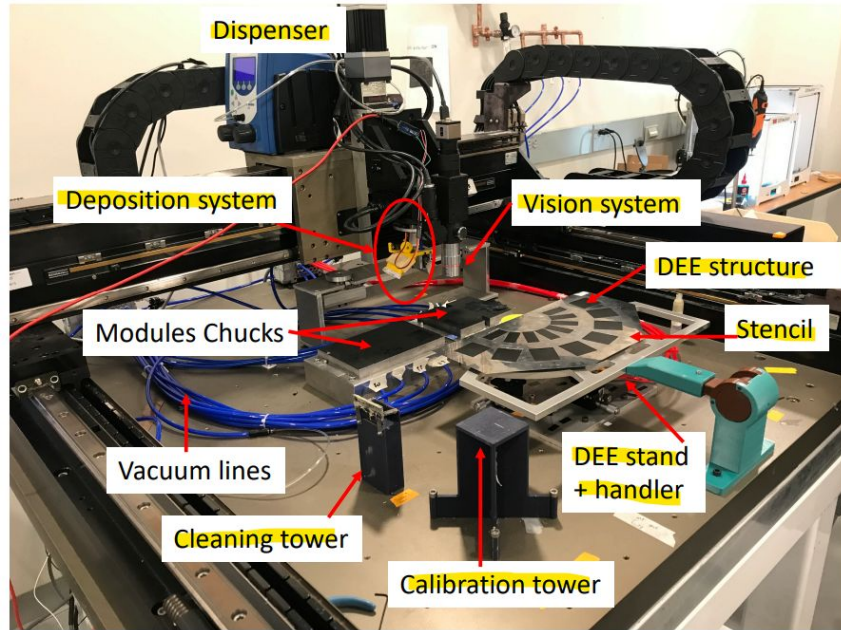
1. Make the Dee (Timo's talk)
2. **Deposit T.I.M.**
3. **Pick and place modules**



The Final Result: Dee with modules

1. TIM Deposition Routine

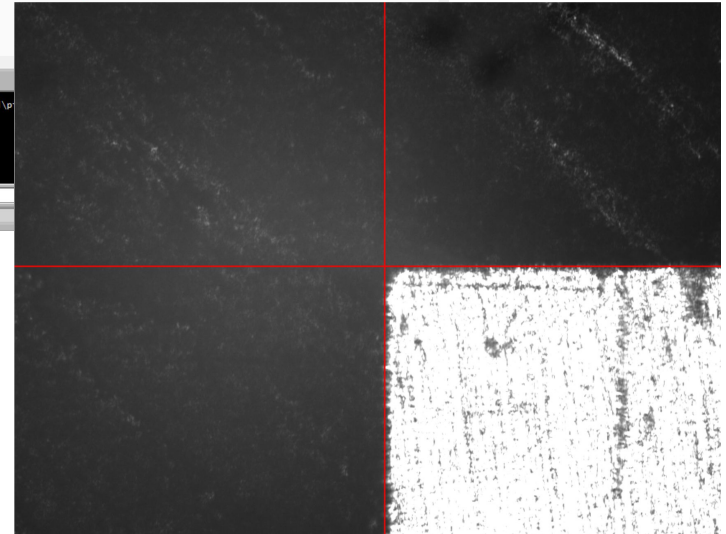
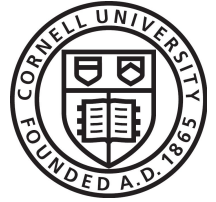
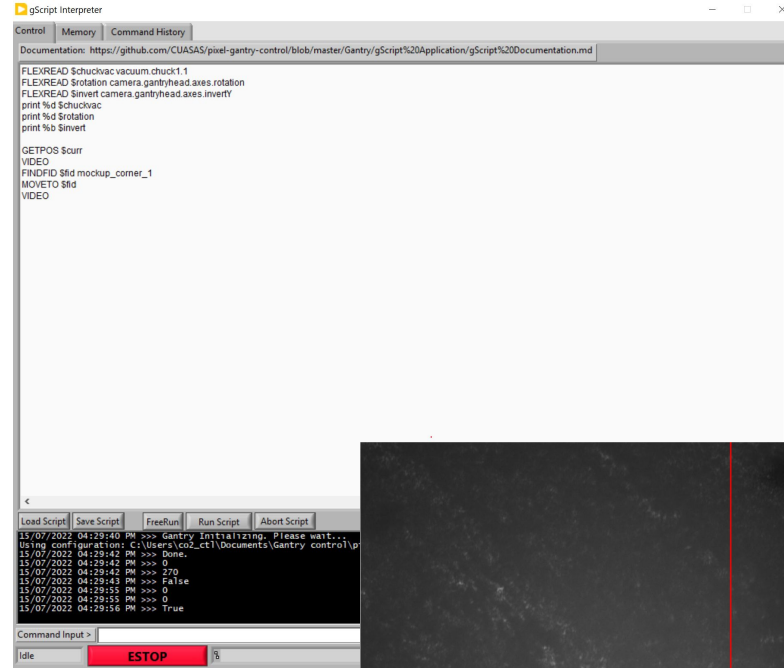
Routine Hardware and Tools

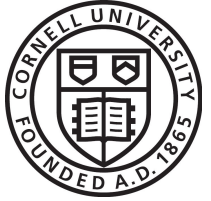


TIM nozzle dispensing onto a stencil on top of a DEE prototype.

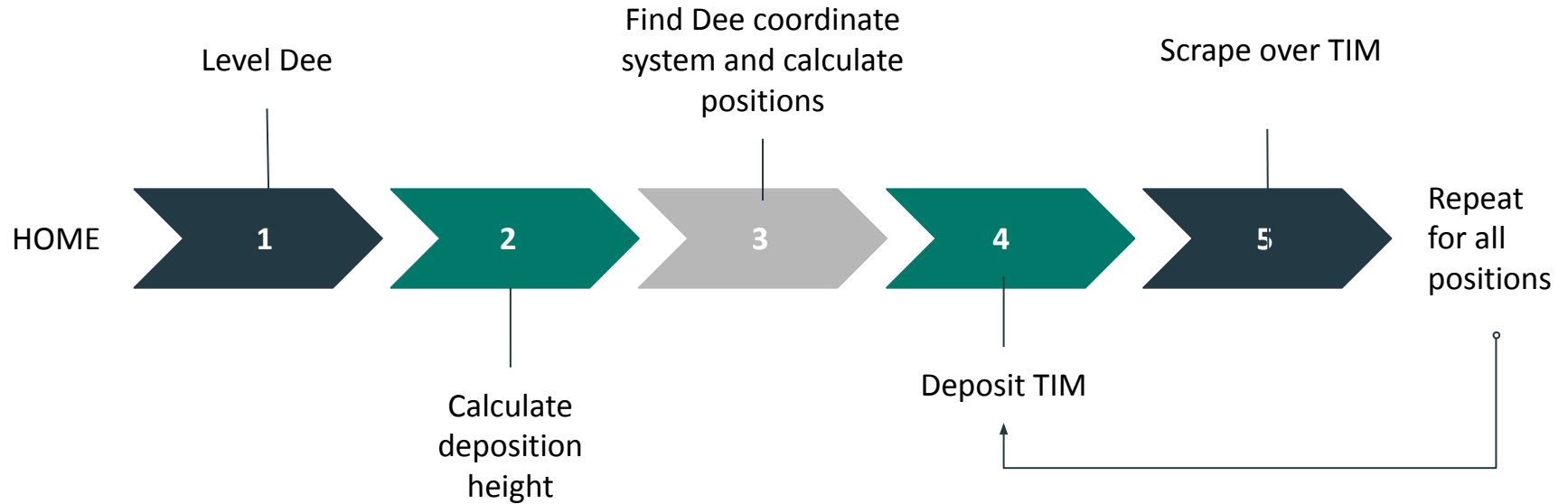
Routine Software

- Code written in gScript
 - Text-based interpreter written within LabView
- flex_config.txt file
 - Stores hardcoded numbers: module positions, offsets, coordinates, etc
- Pattern recognition for finding fiducials
 - Corner finding





TIM Deposition Steps



TIM Deposition Steps

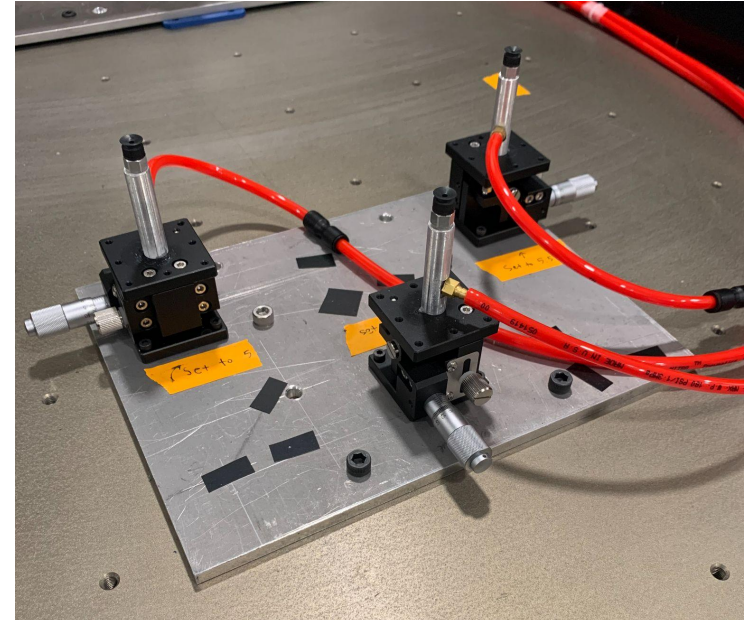
Level Dee

1. Move to each of three stand positions
2. Use camera to calculate height
3. Adjust stands to level

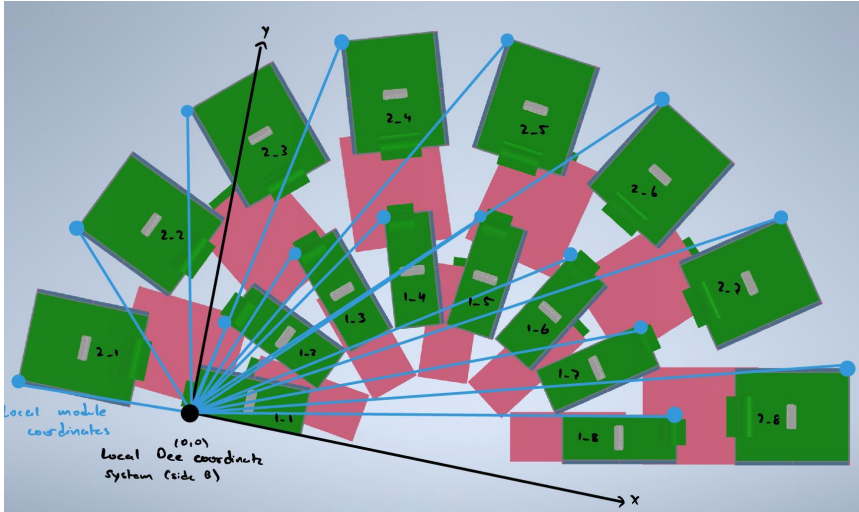


Calculate deposition height

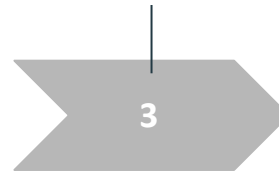
1. Move to calibration tower
2. Follow steps in code
3. Calculates height



TIM Deposition Steps

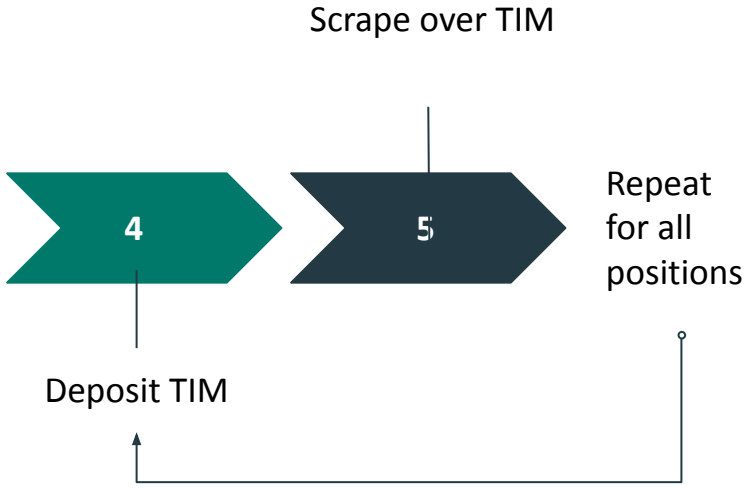
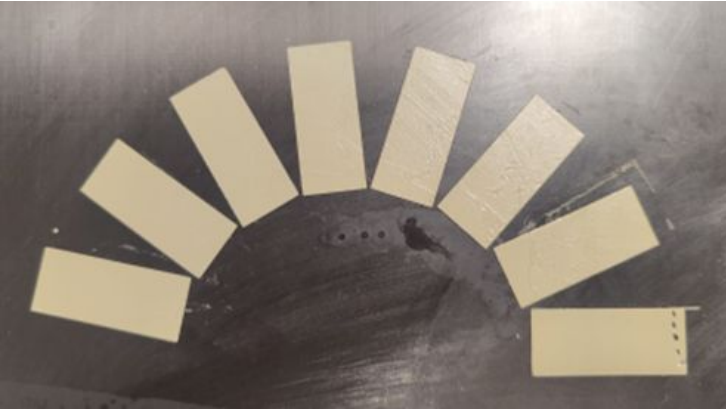
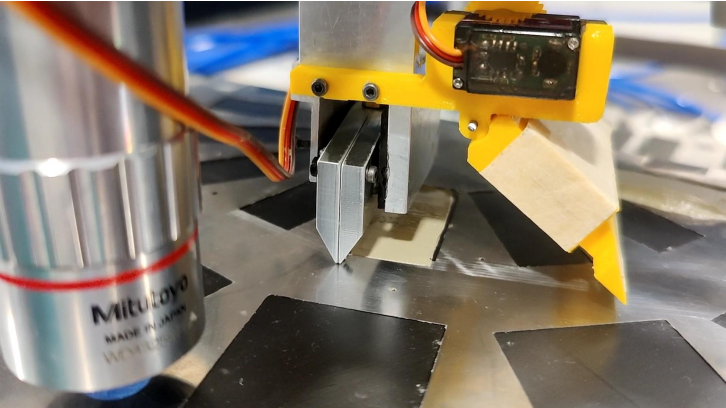
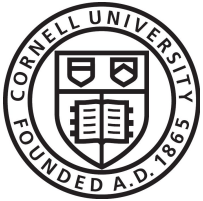


Find Dee coordinate system and calculate positions



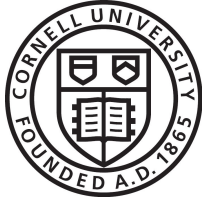
1. Move to reference module
2. Measure the four corners of the module
3. Calculate Dee coordinate system
4. Calculate global deposition positions and rotations

TIM Deposition Steps

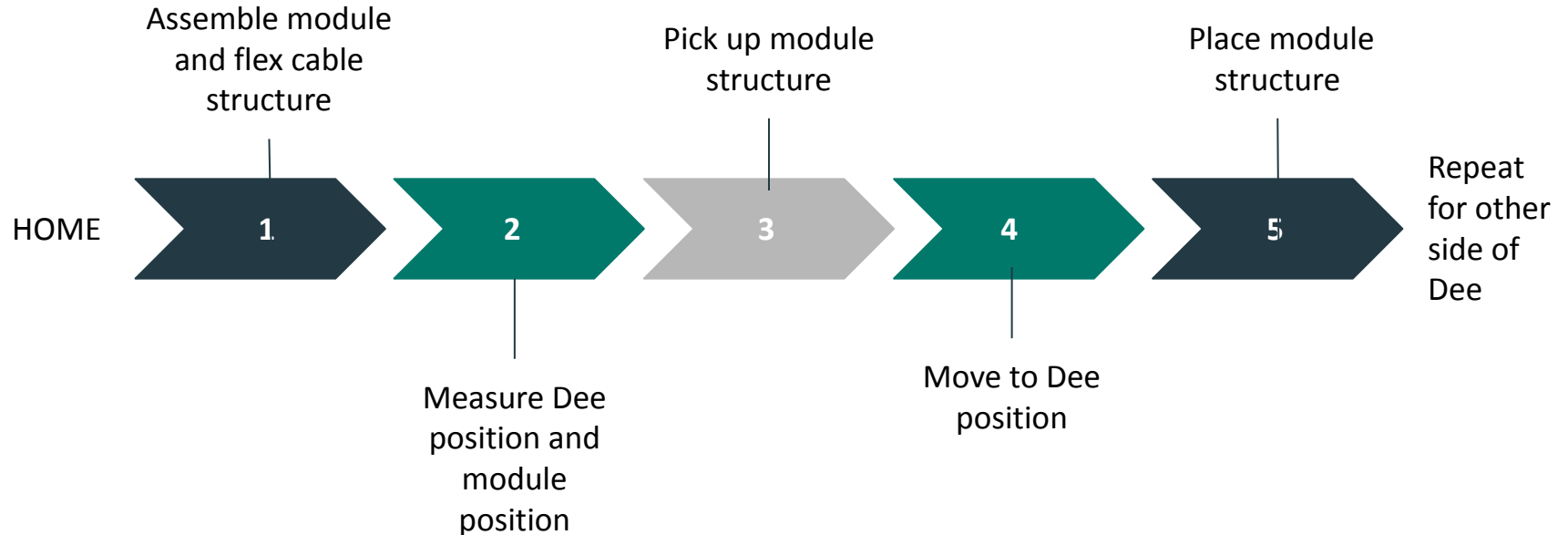


2. Pick and place routine

Note: details of process are currently changing but the general steps of the process will remain the same



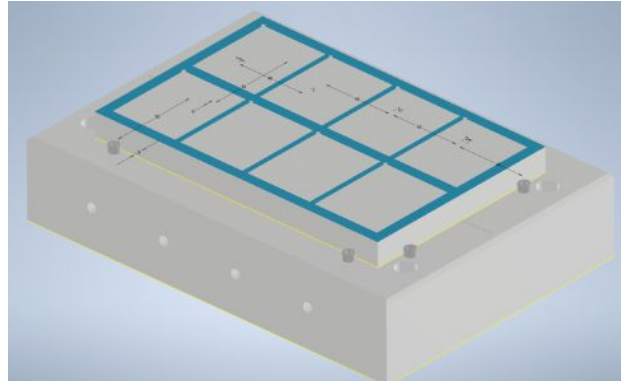
Pick and Place Steps



Pick and Place Steps

Assemble module
and flex cable
structure

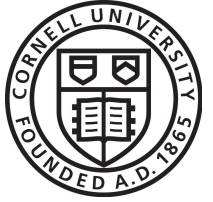
HOME



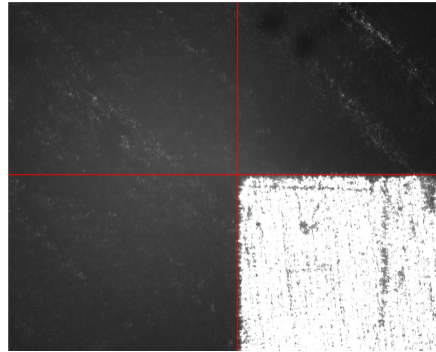
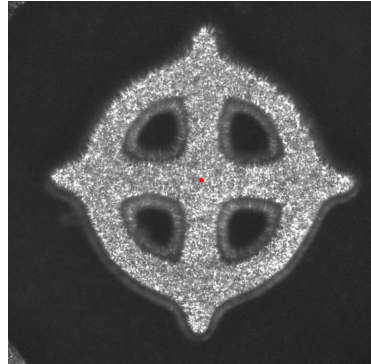
2x2 Chuck -> changing to instead hold
modules and flex cable



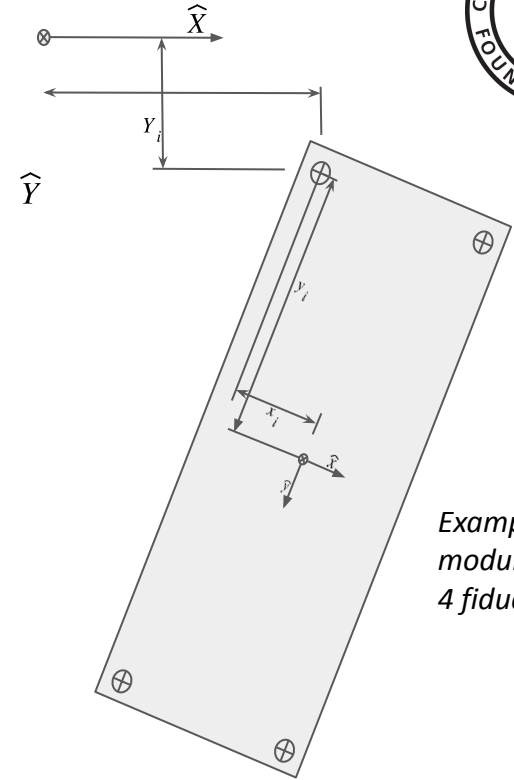
Pick and Place Steps



Measure Dee position and module position

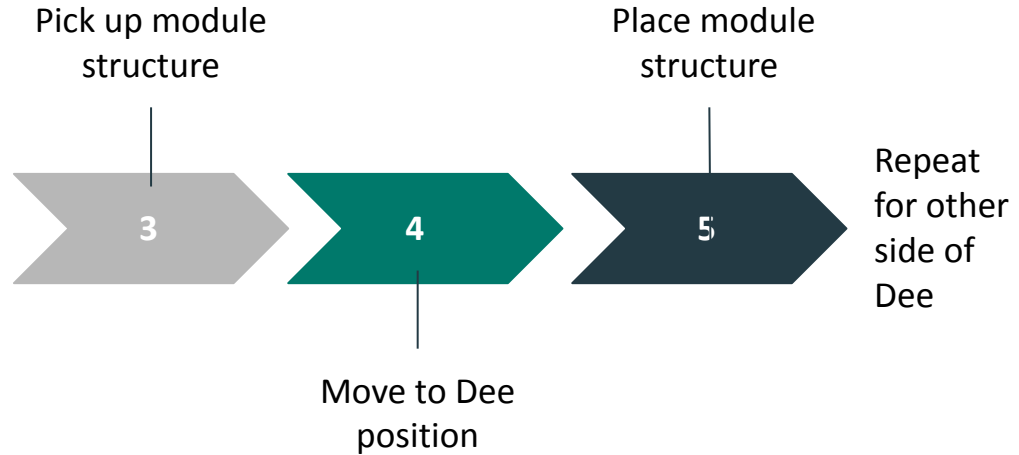
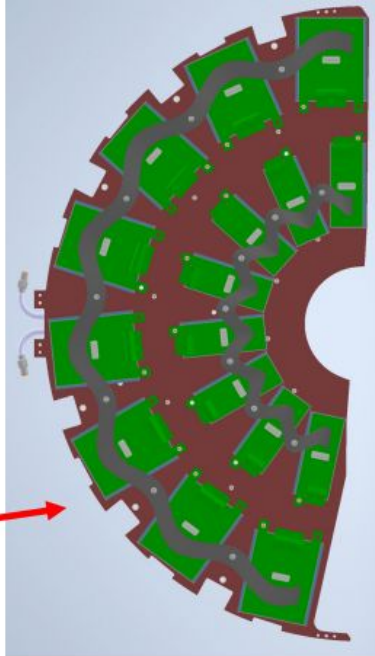
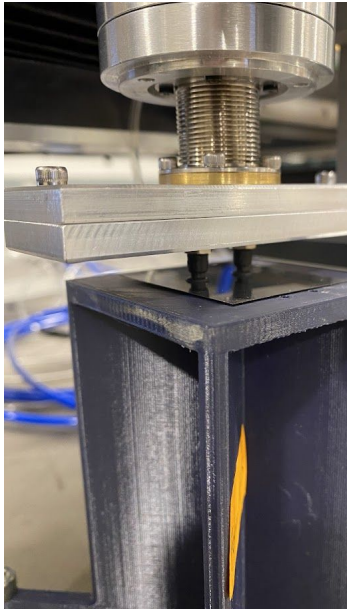


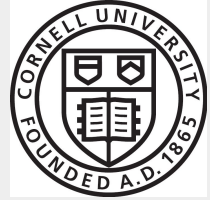
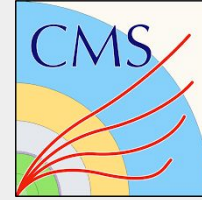
Example fiducials



*Example 2x1 module with 4 fiducials**

Pick and Place Steps





Questions?