

## WHAT IS CLAIMED IS:

1. A computer device comprising at least one processor in communication with at least one memory device, wherein the at least one processor is programmed to:
  - store, in the at least one memory device, a model for simulating a portion of an assembly line;
  - receive scan data of a first inspection of a product being assembled, wherein the first inspection is positioned at a first inspection station in the assembly line subsequent to a first device in the assembly line;
  - execute the model using the scan data as inputs to generate a final profile of the product;
  - compare the final profile to one or more thresholds;
  - determine if the final profile exceeds at least one of the one or more thresholds; and
  - if the determination is that the final profile exceeds at least one of the one or more thresholds, cause the first device to be adjusted.
2. The computer device of Claim 1, wherein the at least one processor is further programmed to generate the model for simulating a portion of an assembly line based on a plurality of inspection data of that assembly line.
3. The computer device of Claim 2, wherein the assembly line includes a second inspection station subsequent to a second device of the assembly line, and wherein the model generates the final profile of the product, which simulates an actual profile of the product upon reaching the second inspection station.
4. The computer device of Claim 3, wherein the second inspection station is positioned subsequent to completion of the assembly line.
5. The computer device of Claim 3, wherein the plurality of inspection data includes a first plurality of scan data of a plurality of individual products

at the first inspection station and a second plurality of scan data of the plurality of individual products at the second inspection station.

6. The computer device of Claim 5, wherein the at least one processor is further programmed to:

receive scan data of a second inspection of a product being assembled at the second inspection station;

compare the scan data of the second inspection to the final profile; and  
adjust the model based on the comparison.

7. The computer device of Claim 1, wherein the product is a semiconductor wafer.

8. The computer device of Claim 7, wherein the first device is a grinder and wherein the first inspection station includes a nanotopography measurement device.

9. The computer device of Claim 1, wherein the at least one processor is further programmed to:

generate one or more adjustments to first device based on the comparison of the final profile to one or more thresholds and the model; and

transmit the one or more adjustments to at least one of a user and the first device.

10. The computer device of Claim 1, wherein if the determination is that the final profile exceeds at least one of the one or more thresholds, the at least one processor is further programmed to:

analyze a plurality of prior inspections to determine a trend;

predict if a subsequent inspection of a subsequent product may exceed at least one of the one or more thresholds based on the trend; and

adjust the first device based on the trend.

11. A method for analyzing an assembly line, the method implemented by a computing device including at least one processor in communication with at least one memory device, the method comprising:

storing, in the at least one memory device, a model for simulating a portion of an assembly line;

receiving scan data of a first inspection of a product being assembled, wherein the first inspection is positioned at a first inspection station in the assembly line subsequent to a first device in the assembly line;

executing the model using the scan data as inputs to generate a final profile of the product;

comparing the final profile to one or more thresholds;

determining if the final profile exceeds at least one of the one or more thresholds; and

if the determination is that the final profile exceeds at least one of the one or more thresholds, causing the first device to be adjusted.

12. The method of Claim 11 further comprising generating the model for simulating a portion of an assembly line based on a plurality of inspection data of that assembly line.

13. The method of Claim 12, wherein the assembly line includes a second inspection station subsequent to a second device of the assembly line, and wherein the model generates the final profile of the product, which simulates an actual profile of the product upon reaching the second inspection station.

14. The method of Claim 13, wherein the second inspection station is positioned subsequent to completion of the assembly line.

15. The method of Claim 13, wherein the plurality of inspection data includes a first plurality of scan data of a plurality of individual products at the first inspection station and a second plurality of scan data of the plurality of individual products at the second inspection station.

16. The method of Claim 15 further comprising:  
receiving scan data of a second inspection of a product being assembled at the second inspection station;  
comparing the scan data of the second inspection to the final profile; and  
adjusting the model based on the comparison.
17. The method of Claim 11, wherein the product is a semiconductor wafer.
18. The method of Claim 17, wherein the first device is a grinder and wherein the first inspection station includes a nanotopography measurement device.
19. The method of Claim 11 further comprising:  
generating one or more adjustments to first device based on the comparison of the final profile to one or more thresholds and the model; and  
transmitting the one or more adjustments to at least one of a user and the first device.
20. The method of Claim 11, wherein if the determination is that the final profile exceeds at least one of the one or more thresholds, the method further comprises:  
analyzing a plurality of prior inspections to determine a trend;  
predicting if a subsequent inspection of a subsequent product may exceed at least one of the one or more thresholds based on the trend; and  
adjusting the first device based on the trend.