CLAIMS:

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:

generate a model for simulating a portion of an assembly line based on a plurality of inspection data of that assembly line, wherein the assembly line includes at least a first device, a first inspection station subsequent to the first device, and a plurality of secondary devices, wherein the plurality of secondary devices are subsequent to the first device, wherein the assembly line includes a second inspection station subsequent to a second device of the plurality of secondary devices of the assembly line, and 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;

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

receive scan data of a first inspection of a product being assembled, wherein the first inspection is positioned at the first inspection station in the assembly line subsequent to the first device in the assembly line and prior to the plurality of secondary devices;

execute the model using the scan data as inputs to generate a final profile of the product, wherein the model simulates an actual profile of the product upon reaching the second inspection station;

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 second inspection station is positioned subsequent to completion of the assembly line.

3. The computer device of Claim 1, 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.

4. The computer device of Claim 1, wherein the product is a semiconductor wafer, wherein the first device is a grinder, and wherein the first inspection station includes a nanotopography measurement device.

5. 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.

6. The computer device of Claim 1, wherein if the determination is that the final profile does not exceed 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 associated with the first device;

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 to prevent the subsequent inspection from exceeding the at least one of the one or more thresholds.

7. 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:

generating a model for simulating a portion of an assembly line based on a plurality of inspection data of that assembly line, wherein the assembly line includes at least a first device and a second device, wherein the second device is subsequent to the first device, wherein the assembly line includes a second inspection station subsequent to the second device of the assembly line, and wherein the second inspection station is positioned subsequent to completion of the assembly line;

storing, in the at least one memory device, the 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 the first device in the assembly line and prior to the second device processing the product to be assembled;

executing the model using the scan data as inputs to generate a final profile of the product, wherein the model simulates an actual profile of the product upon reaching the second inspection station;

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.

8. The method of Claim 7, 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.

9. The method of Claim 8 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.

10. The method of Claim 7, wherein the product is a semiconductor wafer, wherein the first device is a grinder and wherein the first inspection station includes a nanotopography measurement device.

11. The method of Claim 7 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.

12. The method of Claim 7, wherein if the determination is that the final profile does not exceed at least one of the one or more thresholds, the method further comprises:

analyzing a plurality of prior inspections to determine a trend associated with the first device;

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 to prevent the subsequent inspection from exceeding the at least one of the one or more thresholds.

13. The computer device of claim 1, wherein the plurality of secondary devices further includes a third device and a third inspection station, wherein the third device and the third inspection station are between the first device and the second device on the assembly line, and wherein the at least one processor is further programmed to:

execute the model using the scan data as inputs to generate a secondary profile of the product, wherein the model further simulates the third device processing the product to be assembled;

receive secondary scan data of the product to be assembled from the third inspection station subsequent to the third device processing the product to be assembled;

compare the secondary scan data to the secondary profile; and

if there is a difference between the secondary scan data and the secondary profile, cause the third device to be adjusted.

14. The computer device of claim 13, wherein the at least one processor is further programmed to execute the model using the secondary scan data as inputs to generate the final profile of the product, wherein the model simulates the second device.

15. 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:

generate a model for simulating a portion of an assembly line based on a plurality of inspection data of that assembly line, wherein the assembly line includes at least a first device and a plurality of secondary devices, wherein the plurality of secondary devices are subsequent to the first device, wherein the assembly line includes a second inspection station subsequent to ~~the~~a second device of the assembly line, and wherein the second inspection station is positioned subsequent to completion of the assembly line;

store, in the at least one memory device, the 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 the first device in the assembly line and prior to the plurality of secondary devices;

execute the model using the scan data as inputs to generate a final profile of the product, wherein the model simulates an actual profile of the product upon reaching the second inspection station;

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.

16. The computer device of claim 15, 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.

17. The computer device of claim 15, wherein the product is a semiconductor wafer, wherein the first device is a grinder, and wherein the first inspection station includes a nanotopography measurement device.

18. The computer device of claim 15, wherein if the determination is that the final profile does not exceed 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 associated with the first device;

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 to prevent the subsequent inspection from exceeding the at least one of the one or more thresholds.

~~19. The computer device of claim 15, 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, 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.~~