

## CLAIMS

1. A method comprising:
  - a processing device executing:
    - receiving a first request to initiate a set of operations to be run at a manufacturing system, wherein the set of operations comprises a plurality of operations that each have one or more time constraints;
    - determining a first plurality of candidate substrates to be processed during the set of operations;
    - running a first simulation of the set of operations for the first plurality of candidate substrates over a first time period, wherein the first simulation generates a first simulation output indicating a first number of candidate substrates that were successfully processed during each of the simulated set of operations to reach an end of the first time period; and
    - initiating, by setting a substrate counter value for a first operation of the set of operation based on the first number of indicated by the first simulation output, the set of operations at the manufacturing system to process the first number of candidate substrates over the first time period.
2. The method of claim 1, further comprising:
  - the processing device executing:
    - determining a set of time constraint windows based on each of the plurality of operations of the set of operations that each have the one or more time constraints; and
    - identifying, a largest time constraint window of the set of time constraint windows, wherein the first time period corresponds to an amount of time associated with the largest time constraint window.
3. The method of claim 1, wherein initiating the set of operations at the manufacturing system to process the first number of candidate substrates comprises:
  - setting the substrate counter value for the first operation of the set of operations to correspond to the first number, wherein the substrate counter value defines a total number of substrates at the manufacturing system to be initiated at the first operation over the first time period.
4. The method of claim 3, further comprising:
  - the processing device executing:

receiving a second request to initiate the set of operations to be run at the manufacturing system;

determining a second plurality of candidate substrates to be processed during the set of operations;

running a second simulation of the set of operations for the second plurality of candidate substrates over a second time period, wherein the second simulation generates a second simulation output indicating a second number of candidate substrates that were successfully processed during each of the simulated set of operations to reach an end of the second time period; and

updating the substrate counter value for the first operation of the set of operations to correspond to the second number.

5. The method of claim 1, wherein the first simulation further generates a second simulation output indicating an additional substrate processing capacity for a manufacturing equipment of the manufacturing system, the additional substrate processing capacity corresponding to a number of substrates that could be successfully processed additionally at the manufacturing equipment within the first time period, and wherein the method further comprises:

the processing device executing:

determining, based on the additional substrate processing capacity for the manufacturing equipment, a second number of candidate substrates, wherein the set of operations are initiated to process the first number of candidate substrates and the second number of candidate substrates over the first time period.

6. The method of claim 5, further comprising:

the processing device executing:

identifying a second plurality of candidate substrates to be processed during the set of operations based on the second number;

running a second simulation of the set of operations for the first plurality of candidate substrates and the second plurality of substrates over the first time period, wherein the second simulation generates a third simulation output indicating a third number of candidate substrates that were successfully processed during each of the simulated set of operations to reach the end of the first time period; and

determining whether the third number corresponds to a sum of the first number and the second number, wherein the set of operations are initiated to process the first number of candidate substrates and the second number of candidate substrates responsive to a determination that the third number corresponds to a sum of the first number and the second number.

7. The method of claim 1, wherein the one or more time constraints for an operation of the set of operations each comprise an amount of time after completion of the operation that one or more subsequent operations of the set of operations are to be completed.

8. The method of claim 1, wherein the first simulation comprises a heuristic simulation configured to simulate at least one of: one or more substrates being processed during the set of operations, a state of one or more manufacturing equipment of the manufacturing system, one or more operations of a process recipe associated with a substrate at the manufacturing system, or actions performed by an operator at the manufacturing system.

9. A system comprising:  
a memory; and  
a processing device coupled to the memory, the processing device to:  
receive a first request to initiate a set of operations to be run at a manufacturing system, wherein the set of operations comprises a plurality of operations that each have one or more time constraints;  
determine a first plurality of candidate substrates to be processed during the set of operations;  
run a first simulation of the set of operations for the first plurality of candidate substrates over a first time period, wherein the first simulation generates a first simulation output indicating a first number of candidate substrates that were successfully processed during each of the simulated set of operations to reach an end of the first time period; and  
initiate, by setting a substrate counter value for a first operation of the set of operation based on the first number of indicated by the first simulation output, the set of operations at the manufacturing system to process the first number of candidate substrates over the first time period.

10. The system of claim 9, wherein the processing device is further to:  
determine a set of time constraint windows based on each of the plurality of operations of the set of operations that each have the one or more time constraints; and  
identify, a largest time constraint window of the set of time constraint windows, wherein the first time period corresponds to an amount of time associated with the largest time constraint window.
11. The system of claim 9, wherein to initiate the set of operations at the manufacturing system to process the first number of candidate substrates, the processing device is to:  
set the substrate counter value for the first operation of the set of operations to correspond to the first number, wherein the substrate counter value defines a total number of substrates at the manufacturing system to be initiated at the first operation over the first time period.
12. The system of claim 11, wherein the processing device is further to:  
receive a second request to initiate the set of operations to be run at the manufacturing system;  
determine a second plurality of candidate substrates to be processed during the set of operations;  
run a second simulation of the set of operations for the second plurality of candidate substrates over a second time period, wherein the second simulation generates a second simulation output indicating a second number of candidate substrates that were successfully processed during each of the simulated set of operations to reach an end of the second time period; and  
update the substrate counter value for the first operation of the set of operations to correspond to the second number.
13. The system of claim 9, wherein the first simulation further generates a second simulation output indicating an additional substrate processing capacity for a manufacturing equipment of the manufacturing system, the additional substrate processing capacity corresponding to a number of substrates that could be successfully processed additionally at the manufacturing equipment within the first time period, and wherein the processing device is further to:

determine, based on the additional substrate processing capacity for the manufacturing equipment, a second number of candidate substrates, wherein the set of operations are initiated to process the first number of candidate substrates and the second number of candidate substrates over the first time period.

14. The system of claim 13, wherein the processing device is further to:

identify a second plurality of candidate substrates to be processed during the set of operations based on the second number;

run a second simulation of the set of operations for the first plurality of candidate substrates and the second plurality of substrates over the first time period, wherein the second simulation generates a third simulation output indicating a third number of candidate substrates that were successfully processed during each of the simulated set of operations to reach the end of the first time period; and

determine whether the third number corresponds to a sum of the first number and the second number, wherein the set of operations are initiated to process the first number of candidate substrates and the second number of candidate substrates responsive to a determination that the third number corresponds to a sum of the first number and the second number.

15. The system of claim 9, wherein the one or more time constraints for an operation of the set of operations each comprise an amount of time after completion of the operation that one or more subsequent operations of the set of operations are to be completed.

16. A non-transitory computer readable storage medium comprising instructions that, when executed by a processing device, cause the processing device to:

receive a first request to initiate a set of operations to be run at a manufacturing system, wherein the set of operations comprises a plurality of operations that each have one or more time constraints;

determine a first plurality of candidate substrates to be processed during the set of operations;

run a first simulation of the set of operations for the first plurality of candidate substrates over a first time period, wherein the first simulation generates a first simulation output indicating a first number of candidate substrates that were successfully processed during each of the simulated set of operations to reach an end of the first time period; and

initiate, by setting a substrate counter value for a first operation of the set of operation based on the first number of indicated by the first simulation output, the set of operations at the manufacturing system to process the first number of candidate substrates over the first time period.

17. The non-transitory computer readable storage medium of claim 16, wherein the processing device is further to:

determine a set of time constraint windows based on each of the plurality of operations of the set of operations that each have the one or more time constraints; and  
identify, a largest time constraint window of the set of time constraint windows, wherein the first time period corresponds to an amount of time associated with the largest time constraint window.

18. The non-transitory computer readable storage medium of claim 16, wherein to initiate the set of operations at the manufacturing system to process the first number of candidate substrates, the processing device is to:

set the substrate counter value for the first operation of the set of operations to correspond to the first number, wherein the substrate counter value defines a total number of substrates at the manufacturing system to be initiated at the first operation over the first time period.

19. The non-transitory computer readable storage medium of claim 18, wherein the processing device is further to:

receive a second request to initiate the set of operations to be run at the manufacturing system;

determine a second plurality of candidate substrates to be processed during the set of operations;

run a second simulation of the set of operations for the second plurality of candidate substrates over a second time period, wherein the second simulation generates a second simulation output indicating a second number of candidate substrates that were successfully processed during each of the simulated set of operations to reach an end of the second time period; and

update the substrate counter value for the first operation of the set of operations to correspond to the second number.

20. The non-transitory computer readable storage medium of claim 16, wherein the first simulation further generates a second simulation output indicating an additional substrate processing capacity for a manufacturing equipment of the manufacturing system, the additional substrate processing capacity corresponding to a number of substrates that could be successfully processed additionally at the manufacturing equipment within the first time period, and wherein the processing device is further to:

determine, based on the additional substrate processing capacity for the manufacturing equipment, a second number of candidate substrates, wherein the set of operations are initiated to process the first number of candidate substrates and the second number of candidate substrates over the first time period.