Real-Time Data Processing Software

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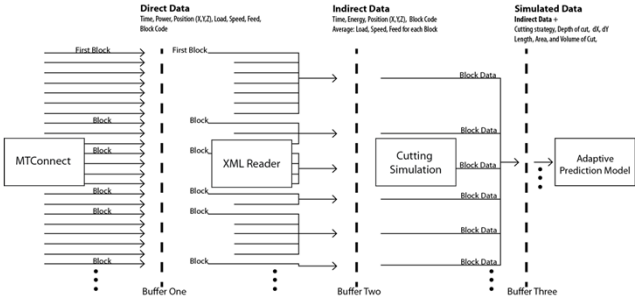
Introduction and Objective

- Real-time data processing is used to collect and process data in parallel to a machine's operation to save time and data storage
- Machine's output data is online and can be accessed remotely from anywhere in the world with internet access
- Goal of the project is to create a user friendly software that will perform real-time data collection and processing of manufacturing data

Methodology

Real-time data processing architecture



Experimental Setup

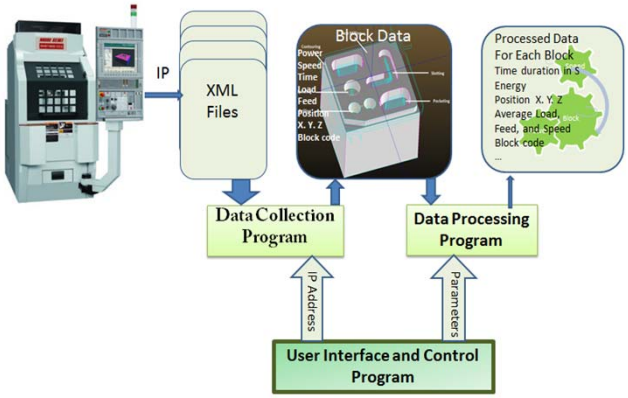
Number of Experiments of data source

Number of Experiments:

96 Milling passes
27 Slotting, Contouring and Pocketing passes
16 Spiraling and Drilling cuts

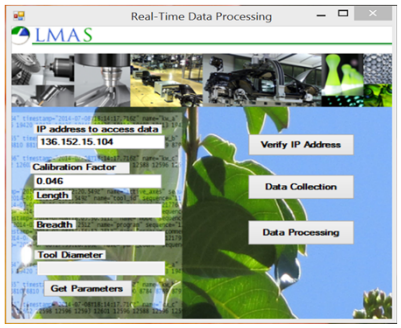
Part	Cycle Time (s)	Data Size (MB)	Processing Time(s)
1	6183	25.26	5699

System Design



Results

User Friendly Interface and Control Program



Results

Data Collection Program
- Read user input IP address and access the online location
- Continuously collect specified data from the controller's output
- Block-wise file creation

Data Processing Program
- Read user input parameters
- Read data from each block file and perform the mathematic calculation
- Synchronize with backend agent

User Interface and Control Program
- Take user input IP address and verify it
- Read input parameters
- Start data collection program and start data processing program

Conclusion

Fast and real time
- Pipe-lined operation: machine active execution, data collection and data processing

Flexible and easy to use
- Programs can be configured to run together in parallel
- Or can be executed as standalone applications
  - Capture a set of data blocks
  - Reprocess set of captured data with different parameters
- With internet access, real-time data can be captured and processed from anywhere in the world

Future Research Directions

- Integrate cutting simulation into the software
- The output of real-time data processing software can be used as input for further modeling or analytics
- Additional applications can be configured to run as part of the real-time data processing software

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