The El-Rewini/Ali Scheduling of In-Forest Task Graph on Two Processors with Communication

Project Presentation

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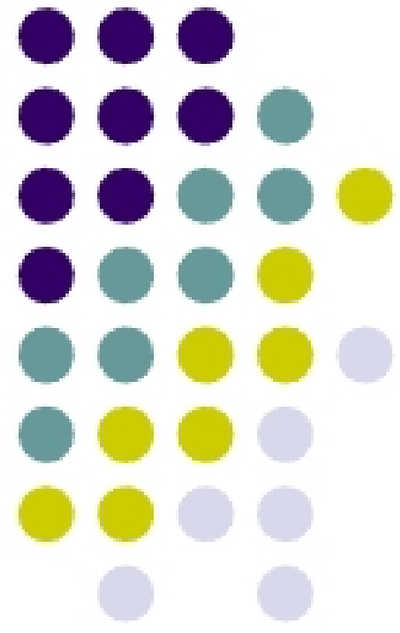

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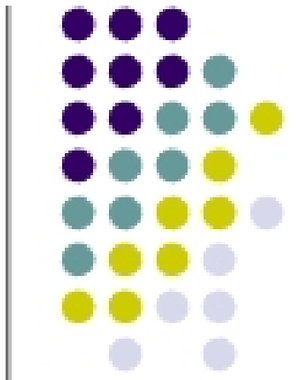
Problem description



- An in-forest task graph allows only one successor task for each node. Out-forest task graphs are reversed.
- The Hu Scheduling algorithm (1961) of in/out-forest task graphs on arbitrary number of processor assumes **no communication cost**.
- The El-Rewini/Ali algorithm (1994) was the first to achieve optimal scheduling of in/out-forest tasks graph **with communication**. It does limit the maximum number of processors to two.
- The El-Rewini/Ali algorithm introduced the notion of Augmental Graph to compensate for the communication cost. The Augmental Graph can be scheduled using the Hu algorithm followed by the SwapAll check to verify or correct the resulting schedule.

My proposed solution

- This project provided an advanced framework to simulate both Hu algorithm (on arbitrary number of processors) and the El-Rewini/Ali algorithm.
- User can create, edit and store task graphs using node and successor arc editors.
- After the required algorithm is selected, the user can animate the process of the GANTT diagram creation.
- Augmental graph creation is show in the detailed algorithm output memo control. Sibling analysis results can be seen graphically.
- My project currently supports only the In-Forest – it can be easily extended for Out-Forest task graphs.