

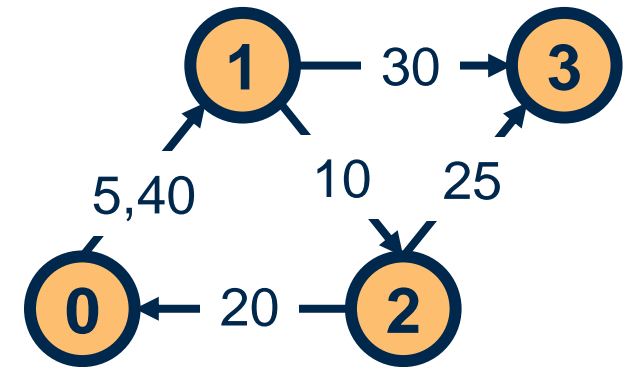
Optimizing Temporal Motif Mining On A GPU

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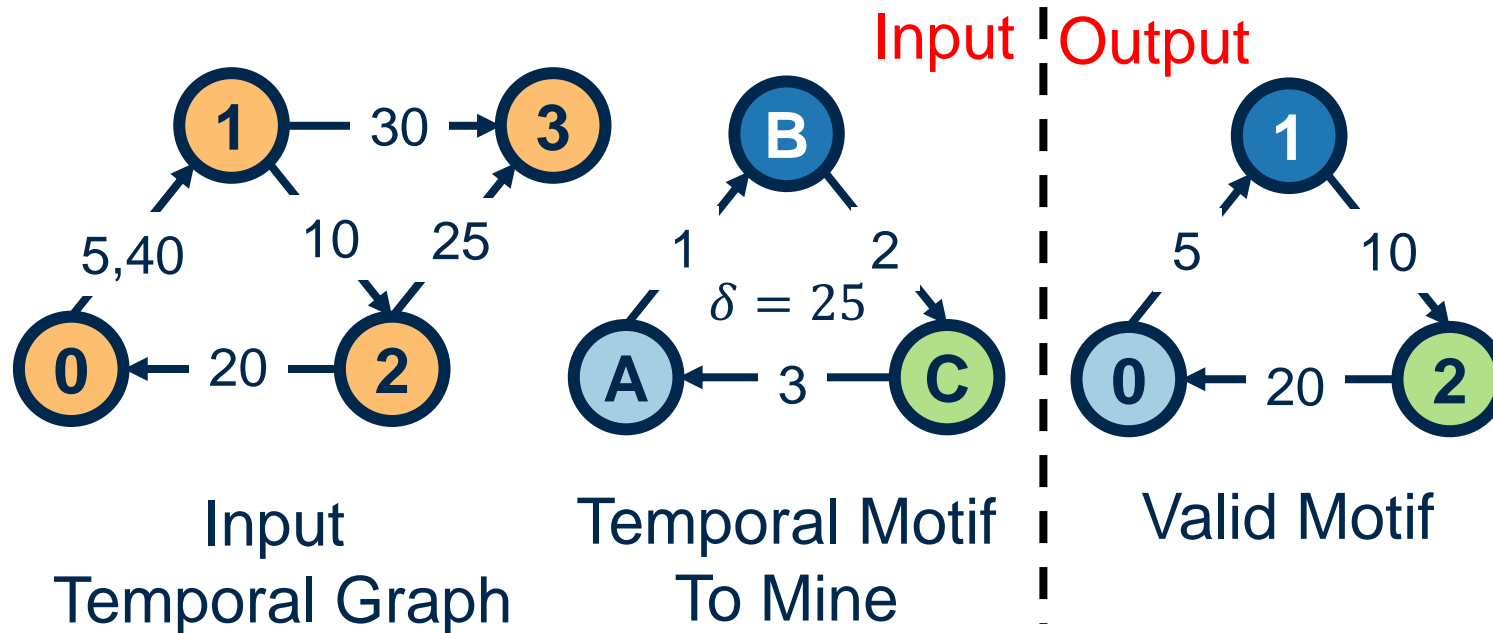
Temporal Graph

- Edge timestamps record the time of interaction between set of nodes
- *E.g.*, email exchange network – timestamp records time for sending/receiving an email from one user to another



Mining Temporal Motifs

- Temporal motifs – chronologically-ordered edge sequences that happen within a time window.
- Temporal Motifs Mining – mining all occurrences of a temporal motif in a temporal graph



Applications Of Mining Temporal Motifs

Information
Flow Analysis
Social Media
Networks



Detection of
Financial
Fraud



Identifying
Insider
Threats

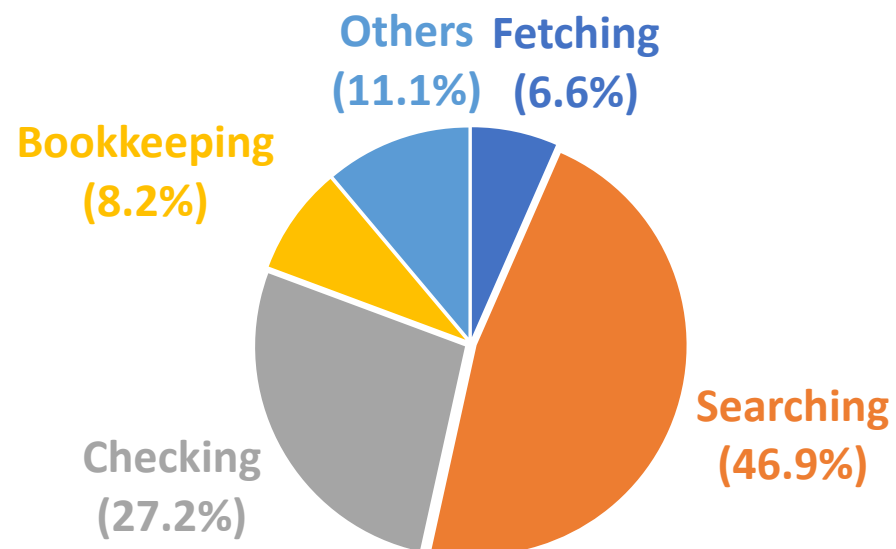


Monitoring
Electrical
Power Grids

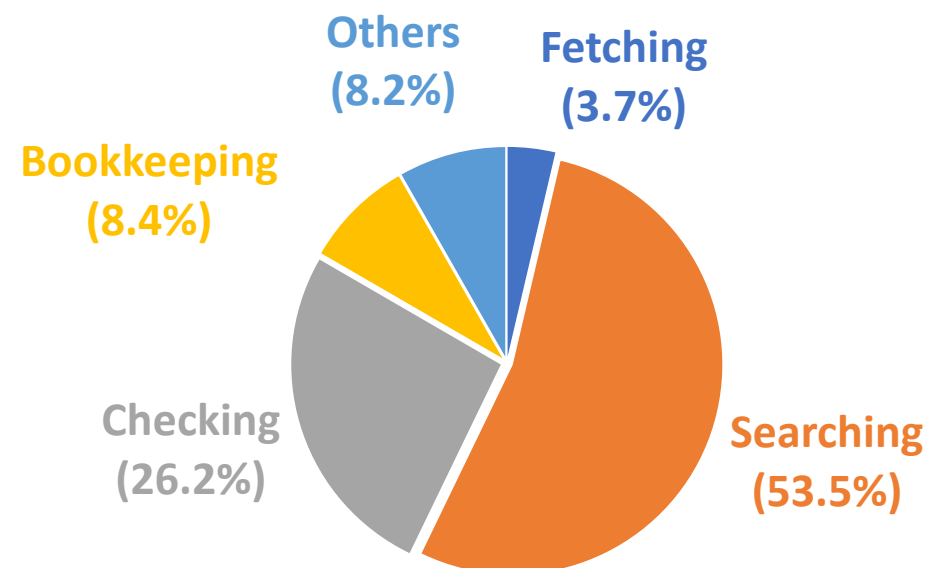


Characterization for a baseline GPU implementation

Instruction Count Distribution

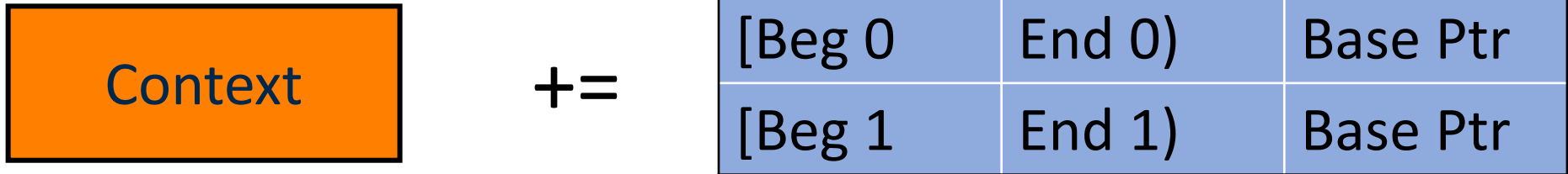


Stall Distribution



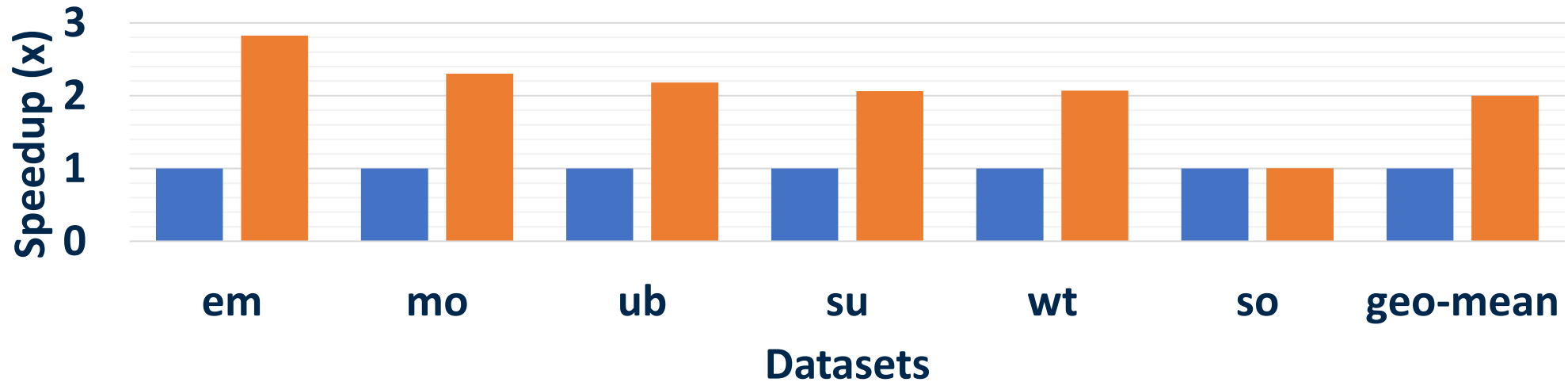
Sub-optimal performance due to excessive search operations

Search Result Memoization



Performance Improvement

■ baseline ■ memoization



Thank You