

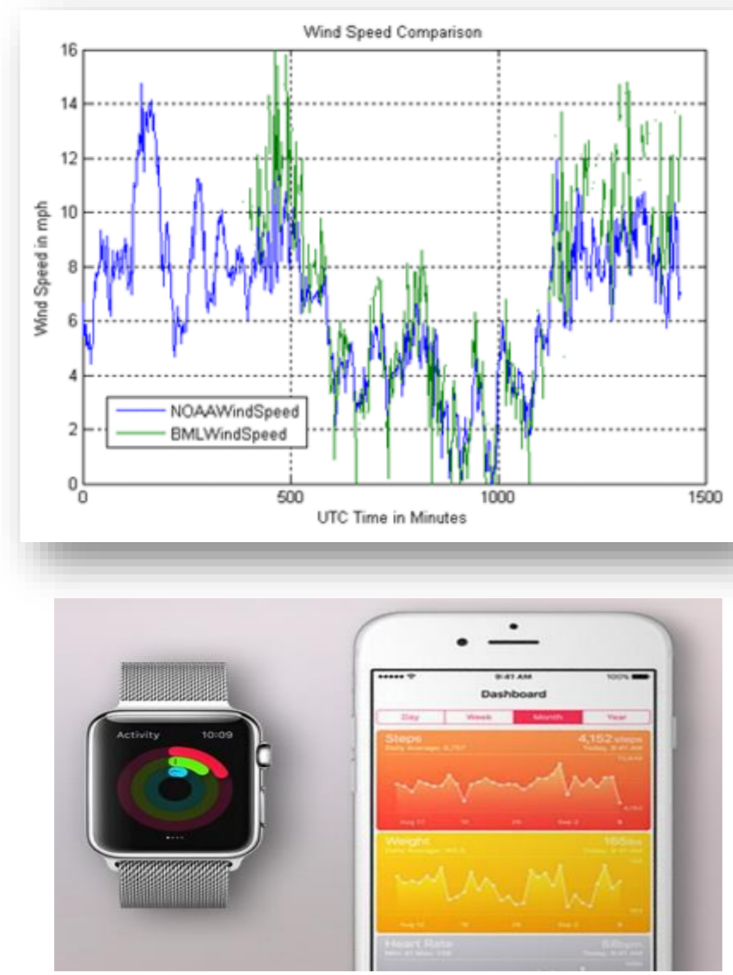
FRESH: A Lock Free Data Series Index

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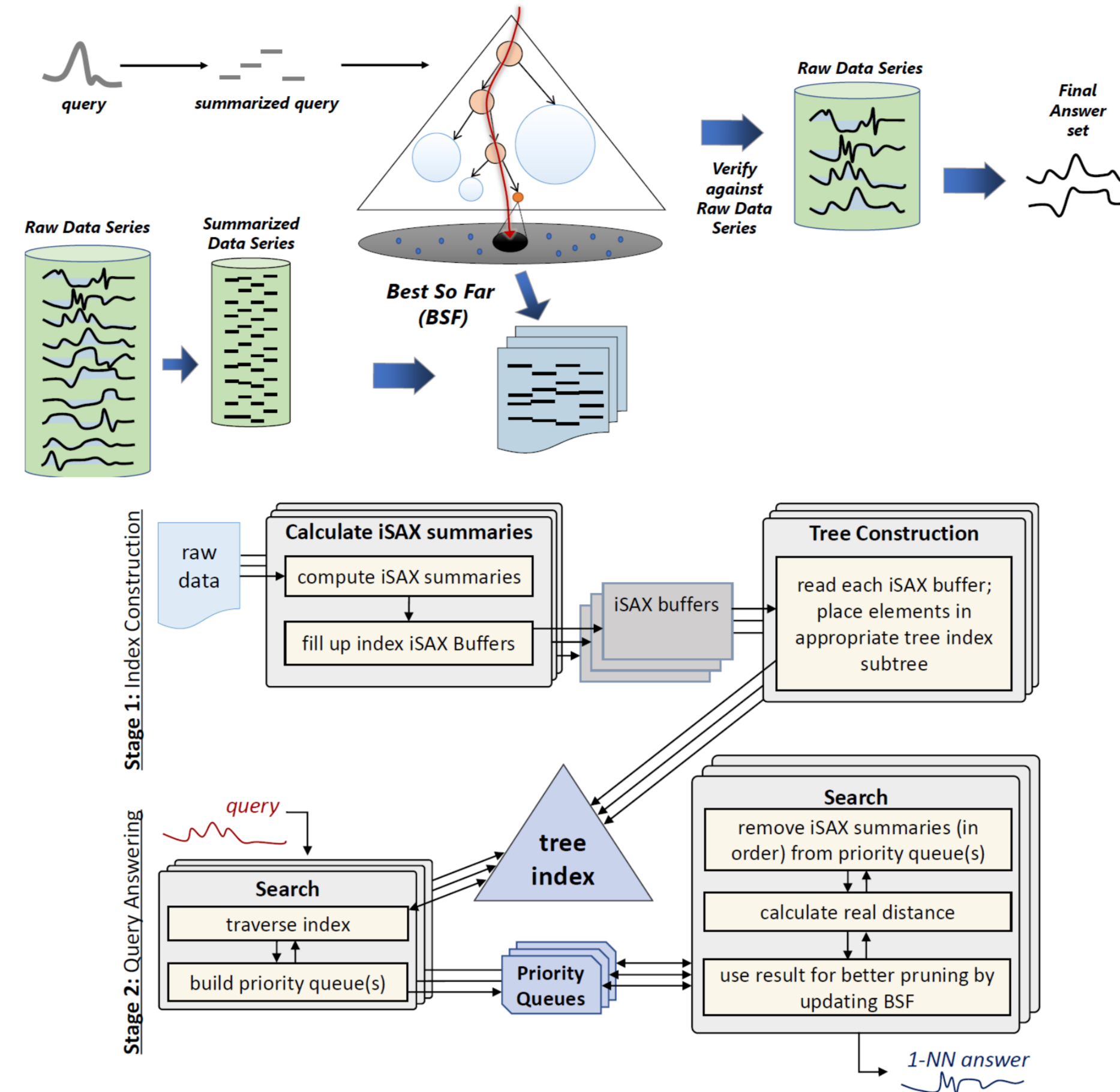
Motivation and Challenges

Data Series

- Many Applications
 - Seismology
 - Astrophysics
 - Neuroscience
 - Engineering etc.

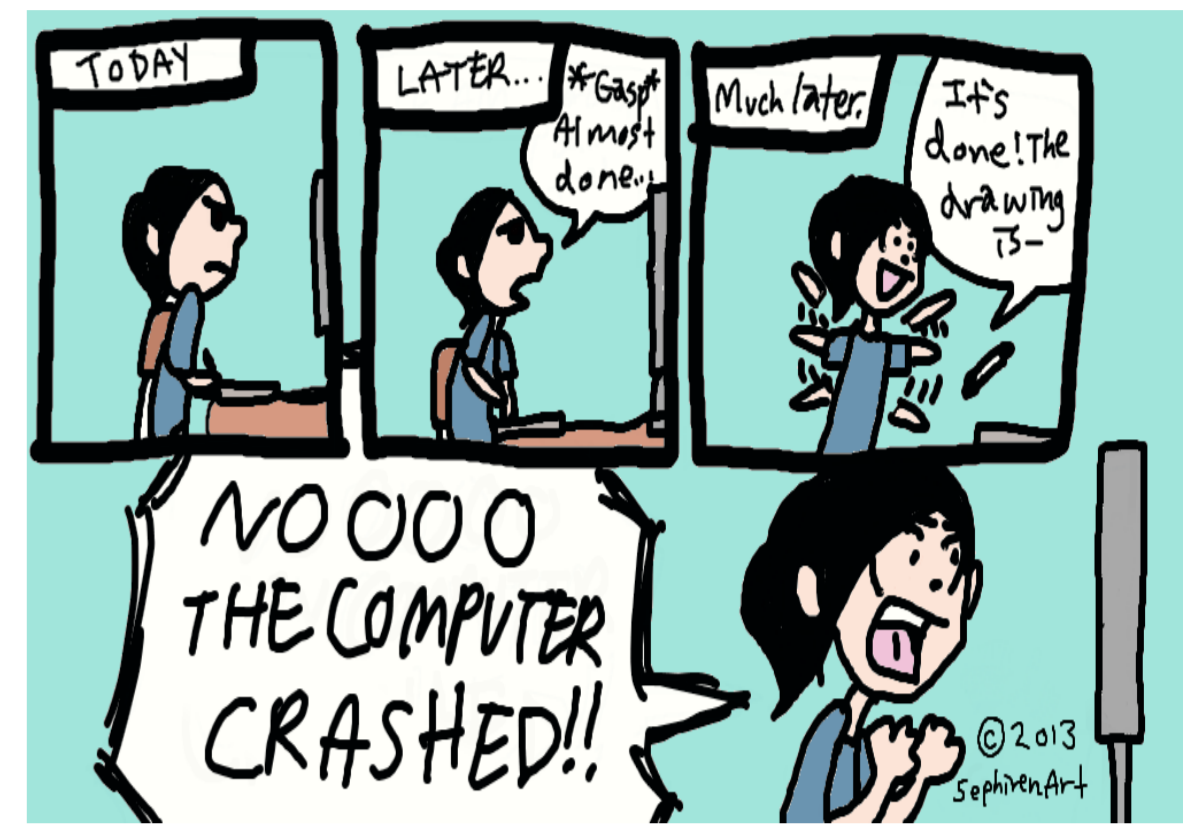


How an iSAX data series index works

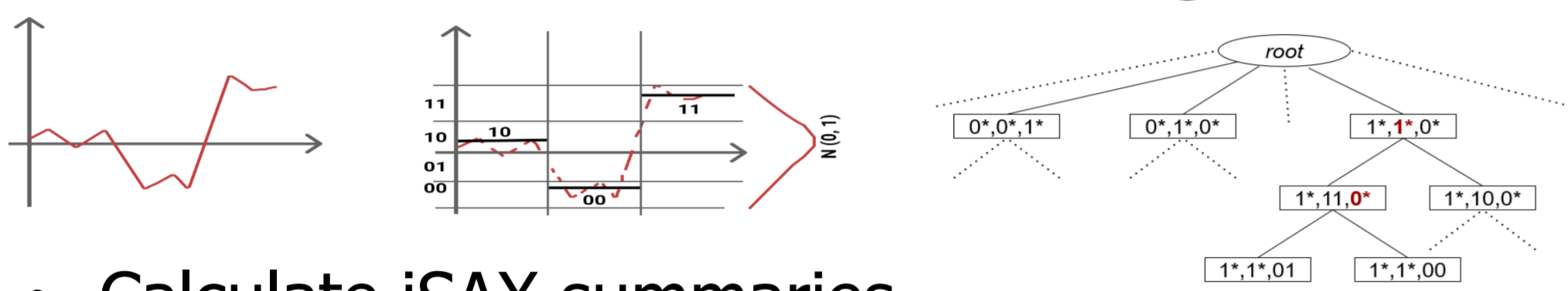


Blocking Implementations

- Use of locks
- Convoying
- Priority Inversion
- Restricted Parallelism
- Thread holding the fails



Data Series Processing



- Calculate iSAX summaries

Similarity Search

Find the most similar series of a collection to a query series

Transform to non-Blocking Implementations

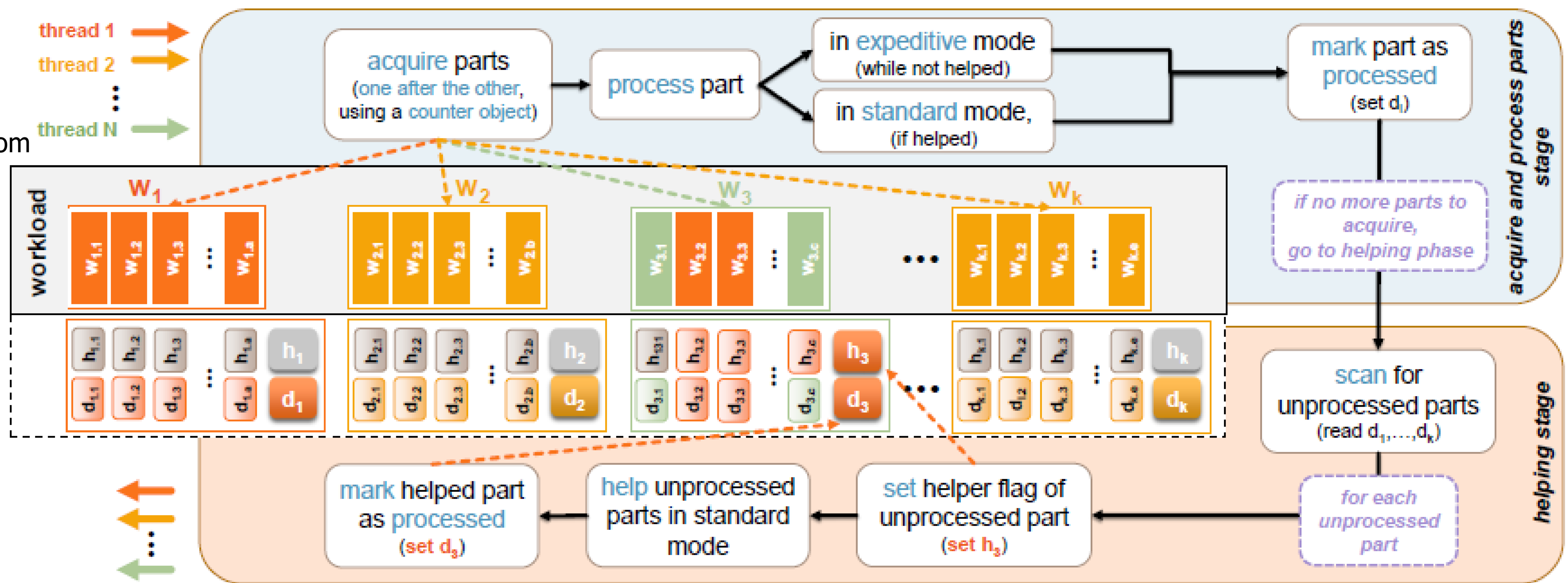
- Some sort of helping is needed.
 - Helping is costly
 - Adds complexity
 - It's not always easy to implement.



Refresh

Generic approach

- Applicable to any blocking locality-aware data series index
- Ensures Lock-Freedom



Evaluation

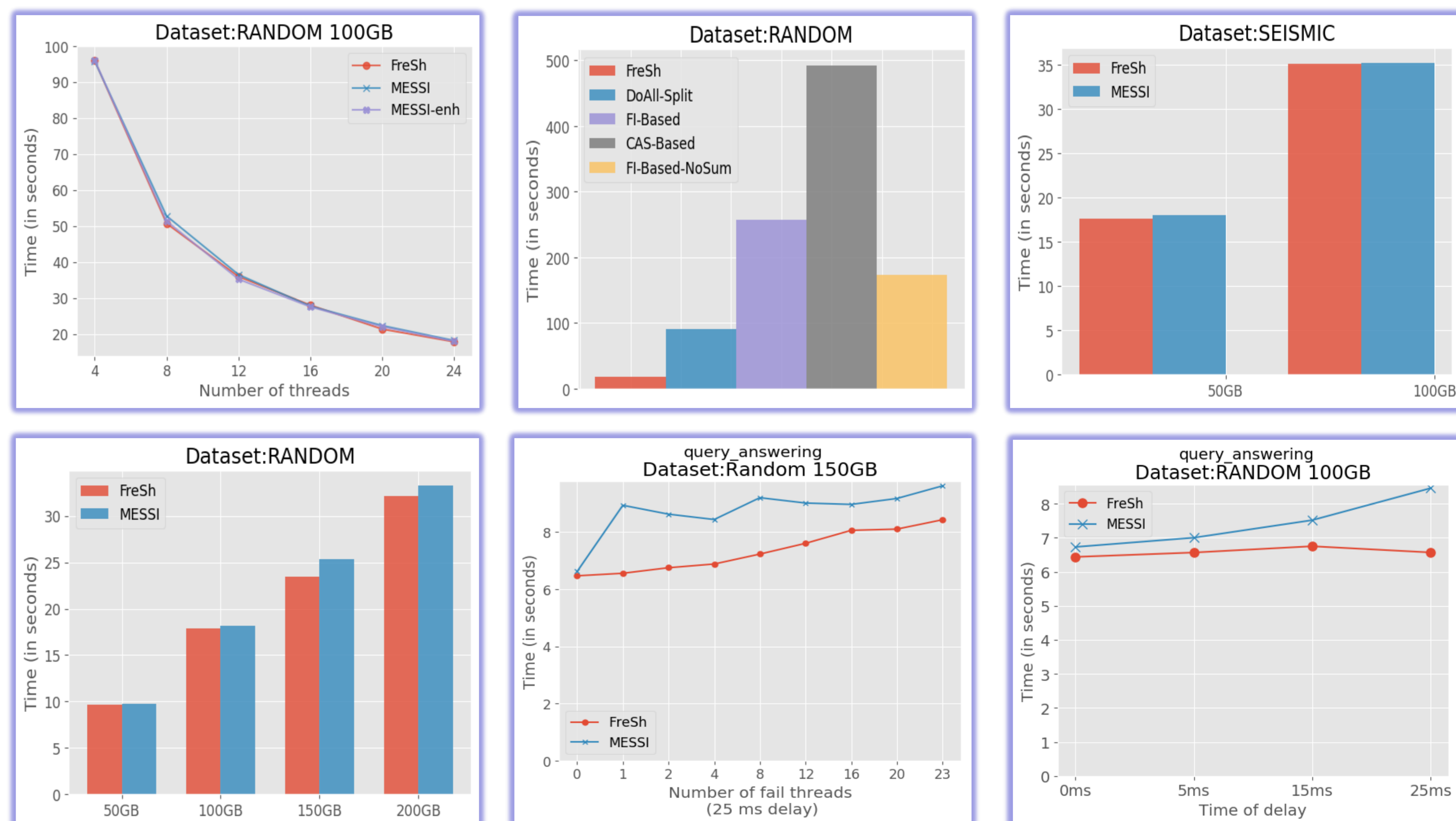
Results

Configurations and Datasets

- Compared with optimized SOTA MESSI index.
- Use both synthetic and real datasets.

Experimental Findings

- FreSh performs as good as the SOTA blocking index.
- No penalty for providing lock-freedom.
- FreSh outperforms by far several lock-free baselines we have designed.
- In case of delays achieves better performance.



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