

# Chasing Away **R**Ats: Semantics and Evaluation for **R**elaxed **A**tomics on Heterogeneous Systems

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**“Everyone can cook”**



**“Everyone (thinks they) can cook”**



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## **Health code violations**

**Typhus**



**Meningitis**



**Plague**



**Salmonellosis**



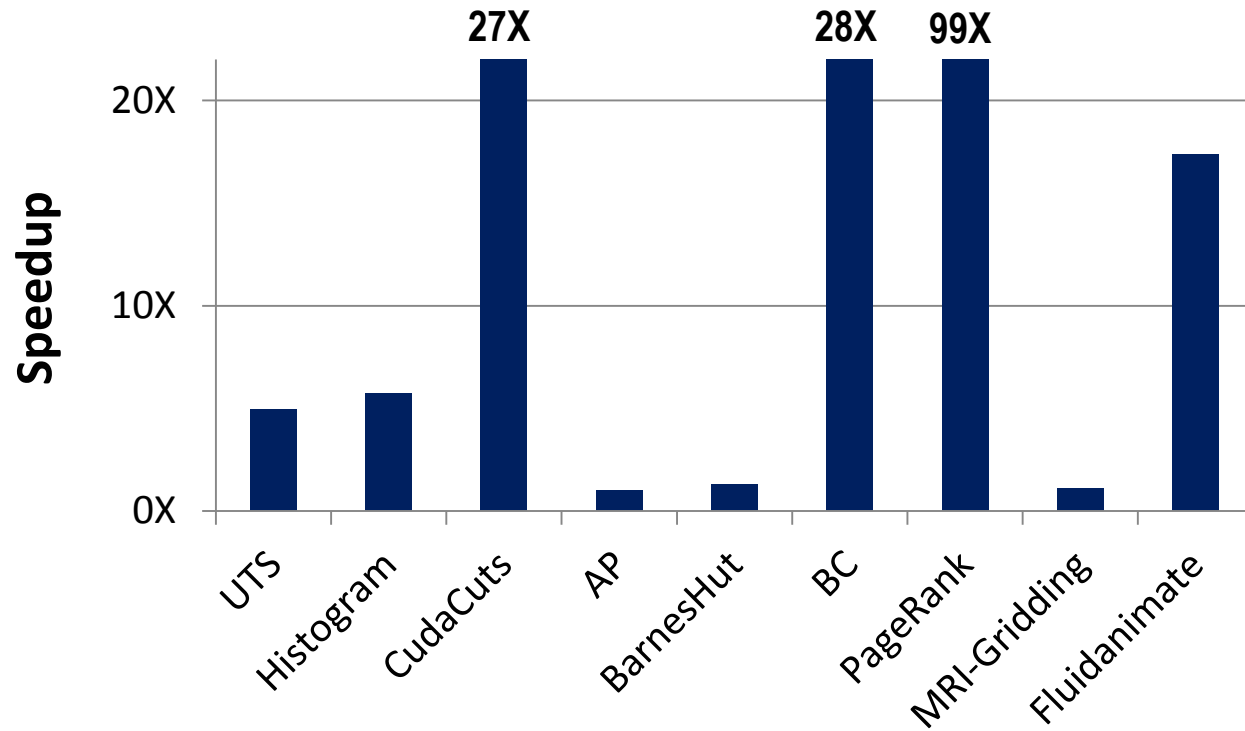
**Rat-bite Fever**



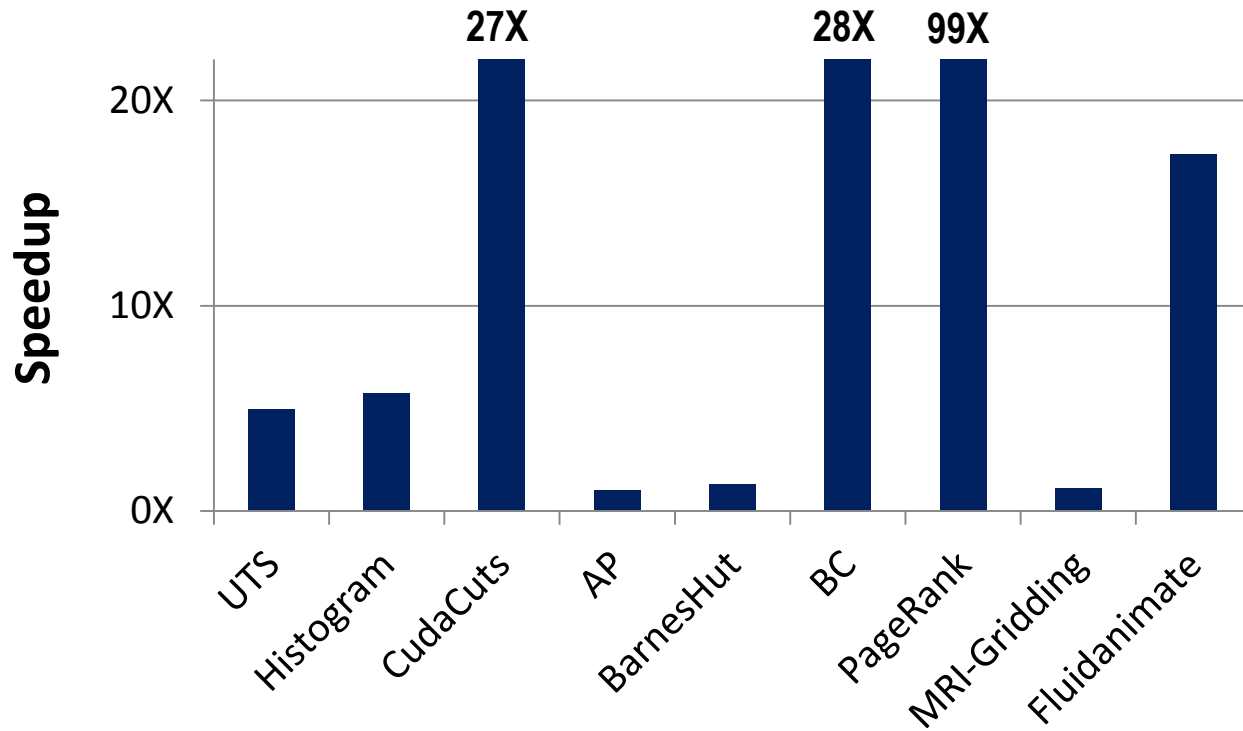
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Correctness ~~Health code~~ violations

Incorrect usage  **No formal specification**  Not portable



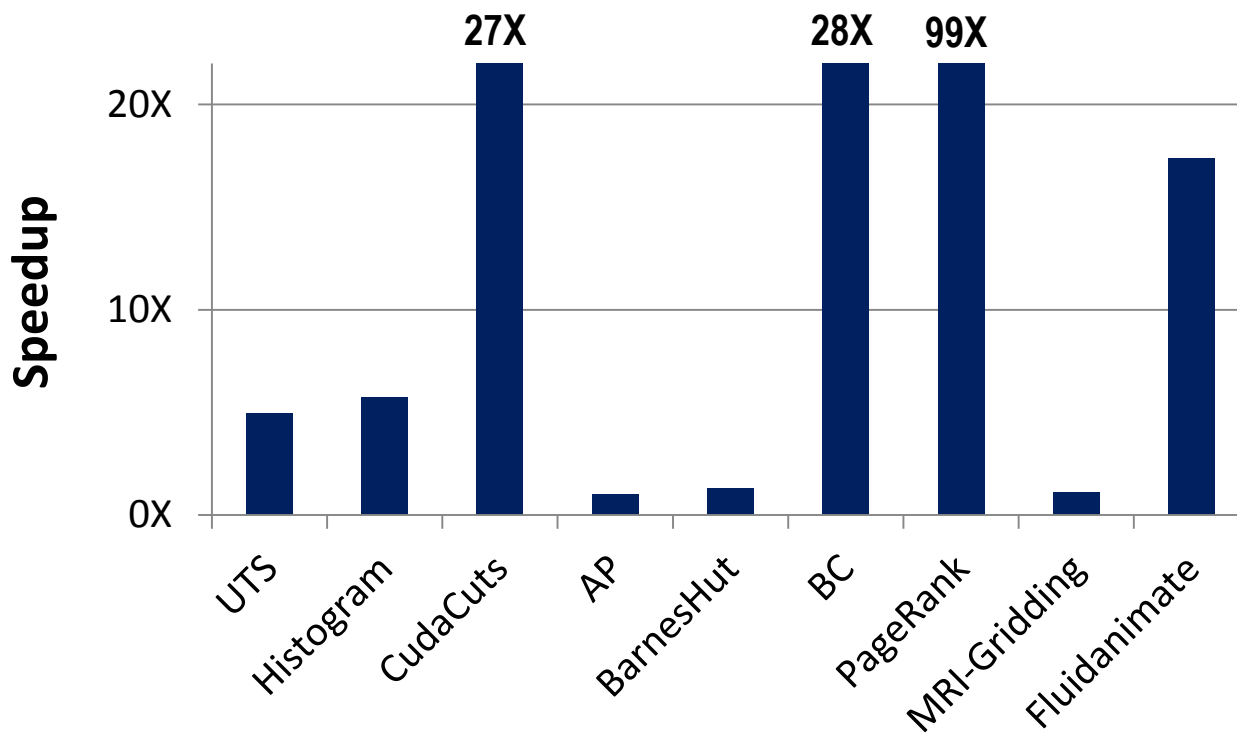
Hard to debug



Out-of-thin-air values



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**Our Goal: Formal Specification + Efficiency**



# Data-Race-Free-Relaxed (DRFrIx) Consistency

Analyze how real codes use relaxed atomics

Work Queues      Seqlocks

Event Counters      Ref Counters

Flags      Split Counters



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**Everyone can use RAts safely**