Code Instrumentation With Non-functional Properties

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Code instrumentation is a common method for tracing programs. Developers use it to understand and monitor modern systems with millions of lines of code. Unfortunately, current software-based tracing methods concentrate on preserving logical correctness only and are thus inadequate for application areas such as embedded systems, real-time systems, and concurrent software. This talk presents a new side of code instrumentation; considering non-functional properties. Specifically, the talk discusses two approaches relevant for time-sensitive applications: (1) Time-aware instrumentation preserves timing constraints under instrumentation and (2) time-triggered runtime verification provides sound monitoring while preserving jitter and resource demand bounds. Although the two approaches concentrate on timing aspects, they clearly demonstrate the need for future work on instrumentation mechanisms that preserve non-functional properties.

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