
A USER-CENTERED APPROACH TO VISUALIZING ALGORITHM BEHAVIOUR FOR REAL-TIME DATABASES.

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Abstract

Real Time Database Systems (RTDBS) designers are charged with systems that produces results in a timely and consistent fashion. Therefore, the design of this kind of databases needs user requirements to support both data structures and the dynamic behaviours of the database algorithms using visualization technique. In this paper, we present a user-centered visualization based on our understanding of the work RTDBS and the needs of designers derived from the first significant user study of RTDBS. The tool presents RTDBS designers with both 'at a glance' understanding of algorithm behavior, and low-level details. The overall satisfaction mean score was 4.83 (std. dev. = 1.27), with mean satisfaction score for the visualization component being 5.17 (std. dev. = 1.11). Users rated the ease of learning a mean score of 4.42 (std. dev. = 1.44). Also, users self-rated performance was strongly correlated to ease of learning (Pearson, 0.84, $p < 0.001$), mirroring the desire for the tool to be easily learnable for success. Also, the user rated the ease of searching and of seeing patterns and anomalies in the data with a mean score of 5.25 (std. dev. = 0.96) and 4.42 (std. dev. = 1.56), respectively. Results from preliminary usability testing of a case study show that users performed better and found easier those RTDBS tasks.

Keywords: *Information visualization, RTDBS, User-Centered design, Usability testing.*