

Enterprise Platform and Integration Concepts | Research Group of Prof. Dr. Hasso Plattner

Autopilot ON: A Cockpit for Self-Driving Databases

MOTIVATION

One of the current trends in the software industry is to automate database configuration and other housekeeping tasks that are typically carried out by human database administrators. The idea is to use machine learning to automatically train the optimal parameters for a given system, dataset, and workload. Several database vendors have announced that they are investing into ‘self-driving’ features to reduce the costs and complexity of operating database installations and to achieve better performance. It is expected that much of the effort in managing, maintaining and tuning database systems can be diminished. The benefit of these advancements will impact database administration in general, regardless of classical on-premise or cloud deployments. However, similar to autonomous vehicles, there are situations where a fully self-driving (‘level 5’) database is not desirable. The role of the database administrator will not become obsolete, but it will change.

GOAL

Building on previous work in database research and our research group, the goal of the Bachelor’s project is to explore how a management cockpit for self-driving databases can ideally support in database administration and monitoring tasks. Hyrise, the main memory research database developed at our research group, already offers a multitude of configuration options and tuning strategies. As part of this project, participants will work with the existing, modern C++ codebase and extend the capabilities of Hyrise with regards to the parameters that are available for tuning. Furthermore, approaches for visualizing and communicating the available strategies and the derived parameter decisions within the database system shall be explored and implemented as an interactive administration cockpit.

SETTING

This Bachelor’s project will be a joint effort of HPI and the SAP Innovation Center Network. We expect a close collaboration between both parties. Project participants will regularly visit

ICN offices to facilitate proper information exchange in both directions. The team will have access to state-of-the-art IT resources provided by HPI.

SKILLS

Prior knowledge and experiences with business applications are not required. However, participants are expected to have prior experiences in database management, for example from the DBS lecture, and should be motivated to specialize in database-specific topics. Motivation to work as a team, communicate results, and dive deep into existing technology is a must. Programming experiences with front-end frameworks (e.g., React, AngularJS), JavaScript, SQL, C++, or Python are beneficial.

CONTACT

For questions and details visit us in the Villa, 2nd floor on Campus II or write us an email.

Jan Kossmann (jan.kossmann@hpi.de)

Dr. Matthias Uflacker (matthias.uflacker@hpi.de)