CEPS

Cognitive Engineering Process Support



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MOTIVATION & GOALS

Motivation: As the complexity of engineering products increases, the processes involved become more **complex** and **collaborative**. This results in numerous corner cases, process variations and completion criteria for different process steps.

Goal: Supporting engineers and process modelers through these processes by:

- Improving artifact traceability and trace navigation
- Supporting more fine-grained artifact properties in process modelling
- Supporting temporally-aware process constraints
- Identifying process deviations at runtime and generating repairs
- Providing runtime, customized process guidance for engineers

Project FactBox Project Name CEPS Project ID MFP II 2.1 Duration 36 Months

Area 2

Cognitive Robotics and Shop Floors

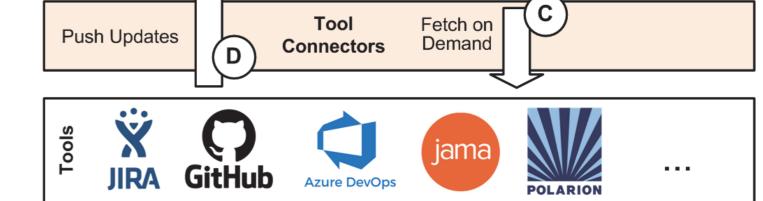
Project Lead

DI Michael Mayrhofer

APPROACH Process Dashboard Refresher 💮 Controls SIELA-jira_[SIELA-20_Integrate Team Centric QA Tracking] Create Process Instance Quality Assurance Constraint: 1. Select Proces SRtraceToBUC SIELA-jira Each SR linked via an MMF must trace to at least one Business Use Case (BUC). Fetch Availabl Execute any one of the following actions to fulfill constraint 2. Enter Artifac Add some issuelinks to linksOutgoing of SIELA-3_Enable Per Team Process View SIELA-20 8 jira_core_artifact Remove SIELA-3_Enable Per Team Process View from linksOutgoing of SIELA-8_Team-centric Views Create > Filter Refresh State

The Guidance Dashboard. The dashboard shows an overview of the process and currently active process step. Here, the engineer can check the pre- and postconditions of the step, as well as the quality constraints to be fulfilled.

SYSTEM ARCHITECTURE System Architect Team QA Engineer Developer Lead **Engineers Process Dashboard** Repair Options В Obtain **Process** Instantiate Datamapping Status **Repair Generator** $\int G$ Process Repair Updates **Incremental Constraint Process Engine** Checker Constraint Create Steps / Update Step State / Update of Evaluation All Change Constraint Changed / Propagate Output to Evaluation Step Output Result Changed **Artifact Store (Database)** Process Instances Load ---▶ Step Constr **Process Definition**



The System Architecture. Tool connectors observe the changes happening in the tools used by the engineers. The changes are passed to the process engine, returning updated process step information.

CONTRIBUTION

Scientific contribution

Publications in reputable journals and conferences

A novel runtime process constraint checking method

A novel runtime-checked temporal constraint specification language

Economic contribution

Supporting faster error recognition and offering repair suggestions Rapidly enabling and training developers and engineers Adding supplementary process monitoring options

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Engineering







