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(57) Abstract :

An artificial intelligence system for real-time code optimization includes a code ingestion interface (101), a feature extraction engine (102), a context synthesis engine (103), an optimization model core (104), a transformation orchestration controller (105), a validation layer (106), a deployment gateway (107), and a telemetry feedback path (108). Software artifacts and runtime conditions are jointly analysed to generate candidate optimization actions, validate semantic and performance acceptability, and selectively apply approved transformations. Feedback from deployed outcomes updates future optimization decisions, thereby enabling adaptive, governed, and context-specific code improvement across heterogeneous execution environments.

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