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(54) Title: MULTI-AGENT COMPUTER CONTROL SYSTEM WITH ITERATIVE OPTIMISATION FOR AUTONOMOUS AGENT COORDINATION

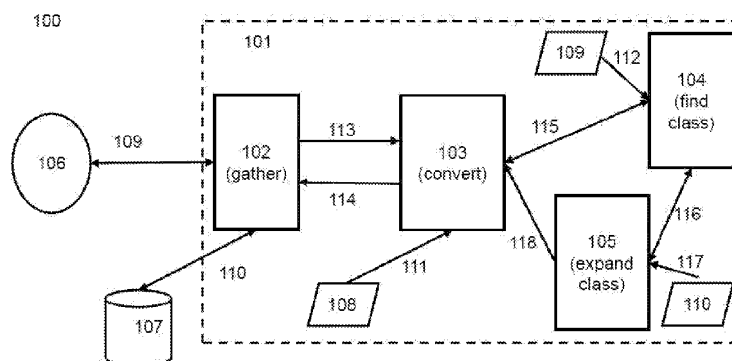


Figure 1 functional schematic of a multiagent computer control system.

(57) Abstract: A multi-agent computer control system optimises the coordination of autonomous agents using an iterative optimisation process. The system initialises system states and relational constraints, receives state intentions from multiple agents, and computes a combined set of permissible states. The optimisation process transforms system states into Base_Equilibrium_Factor_Northogonal (BEFN) states, where equilibrium, factor, and northogonal geometries define structured search directions. The system iteratively refines states by searching along equilibrium geometry, northogonal geometry, and updating the base point to determine an optimised state. Unlike conventional gradient descent methods, which rely on gradient-based minimisation, the present system uses multi-directional search mechanisms that improve constraint-aware optimisation, prevent local minima, and enhance agent coordination. The optimised state is used to dynamically control the agents, ensuring efficient, scalable, and adaptive decision-making in real-time multi-agent environments. The disclosure is applicable to autonomous traffic coordination, robotic systems, distributed computing, multi-objective optimisation and other multi-agent systems requiring dynamic optimisation.

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