**Implicit Invocation Architecture Style**

- Task
- Exception
- Message
- Ether
- Dispatched message
- Wiretap
- Task

**A Task Tree**

- Gather rock
  - Go to position
  - Grab rock
  - Lift rock
- Move left
- Move forward

**Implicit Invocation Architecture Style Evaluation**

- Accommodation of deliberate and reactive behavior: robot must coordinate actions to achieve assigned objectives with the reactions imposed by the environment.

In the TCA (Task-Control Architecture, which is a form of implicit architecture), task trees and task roles permit a clear-cut separation of action and reaction. Explicit support for concurrent agents.
Implicit Invocation Architecture Style Evaluation

- Allowance for uncertainty: robot must function in the context of incomplete, unreliable and contradictory information

How TCA addresses uncertainty is less clear. Often tentative task trees are created when an exceptional event happens.

- Accounting of dangers in the robot's operations and its environment: relating to fault tolerance, safety and performance, problems like reduced power supply, unexpectedly open doors, etc., should not lead to disaster

TCA exception, wiretapping and monitoring features address needs for performance, safety and fault tolerance.

Implicit Invocation Architecture Style Evaluation

- Flexibility: support for experimentation and reconfiguration

Implicit invocation style supports incremental development and replacement of components.

Implicit Invocation Architecture Style Overall Evaluation

- TCA offers a comprehensive set of features for coordinating the tasks of a robot. Most appropriate for more complex robot projects.
Blackboard Architecture Style Evaluation

- Accommodation of deliberate and reactive behavior: robot must coordinate actions to achieve assigned objectives with the reactions imposed by the environment.

  Components communicate via the shared repository: modules indicate their interest in certain types of information; the database returns relevant data either immediately or when some other module inserts the relevant data into the database.

Blackboard Architecture Style Evaluation

- Allowance for uncertainty: robot must function in the context of incomplete, unreliable and contradictory information.

  The blackboard helps to resolve conflicts or uncertainty in the robot's world view.

Blackboard Architecture Style Evaluation

- Accounting of dangers in the robot's operations and its environment: relating to fault tolerance, safety and performance, problems like reduced power supply, unexpectedly open doors, etc., should not lead to disaster.

  The TCA exception mechanisms, wiretapping and monitoring roles can be implemented by defining separate modules that watch the database for exceptional circumstances.
Blackboard Architecture Style Evaluation

- Flexibility: support for experimentation and reconfiguration
  Supports concurrency and maintenance by decoupling senders from receivers.

Blackboard Architecture Style Overall Evaluation

- Capable of modeling the cooperation of tasks in a flexible manner thanks to an implicit invocation mechanism based on the contents of the database