

Overall intentions

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The SOUL project tries to develop a cognitive architecture for complex cognitive control.

Control systems are software-intensive applications that are getting extremely complex not only in the field of distributed large-scale process control (e.g. energy management systems) but also in the context of deeply embedded devices (e.g. in the automotive industry).

Modern trends in controller architectures for autonomous systems (robots, industrial plants, web bots, etc.) are progressively focused in explicit formulations of high-level human cognitive capabilities.

Among them we consider essential the capability of assigning meaning to perceptual flows that the autonomous agent obtains from its interaction with a surrounding physical world and the capability for introspection.

In this project we try to:

- investigate the nature and generation mechanisms of meaning in cognitive autonomous systems and
- to apply the emerging concepts in several research platforms with very different cognitive requirements and contexts: heterogeneity, scalability and visual awareness.

In this context, the project tries to build a formal theory of meaning to be applied in the definition of control mechanisms based on explicit representations of meaning. These mechanisms will be used in the design self-aware control architectures for autonomous systems and will be implemented in the form of reusable software modules using standardized software deployment platforms.

Finally, as real testbeds, the conceptual framework, the architecture and the reusable modules will be used in three application domains: autonomous robots, complex industrial plants and immersive games.