

Systems, models and self-awareness: A SysML model of consciousness

Ricardo Sanz and Carlos Hernández

*Autonomous Systems Laboratory
Universidad Politécnica de Madrid*

Abstract

The advances towards having the necessary competences for engineering self-aware, conscious machines can happen in two main ways: i) as an artisanal practice based on exploratory approaches to mimicking conscious performances of humans and animals or ii) as an engineering practice based on solid scientific theories. If we decide to focus on this second approach, the theories needed must be quantitative and this confronts the mainstream theorisation in the field of consciousness that is mainly descriptive when not purely metaphysical. Beyond the needs for engineering, this quantitative theoretical approach may help reaching a common scientific picture for the consciousness domain. But, while there are some valuable attempts to mathematically formalise some theories of consciousness, they are always facing the problem of the generalised difficulties in understanding mathematical formalism by consciousness research stakeholders. The work in the ASys project addresses these issues in trying to be both precise and descriptive by means of using a semiformal engineering modelling language. The language selected for this work is SysML, a merger of the software-centric Unified Modeling Language and common modelling practices in the systems engineering community. The rationale for this approach is simple: minds are complex systems and to engineer them we need complex systems engineering methods.