

How to Soar with CSP

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Abstract. In this talk, I shall discuss work on the necessary technology required for flight clearance of Autonomous Aircraft employing Agents by reducing the certification problem to small verifiable steps that can be carried out by a machine. The certification of such Agents falls into two parts: the validation of the safety of the Agent; and the verification of the implementation of the agent. The work focuses on the Soar agent language and the main results are:

- language subset for Soar, designed for formal analysis;
- a formal model of the Soar subset written in CSP;
- a prototype translator “Soar2Csp” from Soar to the CSP model;
- a framework for static analysis of Soar agents through model checking using FDR2;
- the identification of “healthiness conditions” required of any Soar Agent;
- a verifiable implementation of the CSP based Soar agents on an FPGA.