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# From novice to expert decision behavior: an automatic modeling approach with Petri nets

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If a user interacts with a computer, then his behavior can be traced with a sequence of states and transitions. To investigate the interaction processes with reasonable complex systems, we need support of special tools. We present a program, that analyze incomplete sequences of states and transitions, to come up with the underlying net structure and different measures of complexity of the decision process.

On the basis of the empirical result [2], that the decision effort of the behavior of novices is significantly larger than the decision effort of experts, we can conclude, that the complexity of the decision behavior is negatively correlated with the cognitive complexity of the corresponding mental model.

One of the most interesting aspect of nets constructed with our analyzing tool is the possibility to measure the behavioral and decision effort in a simple fashion. Now each researcher is able to investigate and model the learning process of a user.

To measure complexity of a system described with a state transition matrix in a quantitative way is one side; the other side is to transform the structure of a given system in an 'appropriate form'. One qualitative approach to figure complexity is drawing the 'net structure' of the system [1]. If we use Petri nets instead of the equivalent state transition formalism [3], we can simulate the user's mental model in an executable form with Petri net simulators, too. As a "radiologist" it is now possible to produce a couple of pictures of decision processes and scan them for interesting pattern.

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[3] A.I. Wasserman, Extending state transition diagrams for the specification of human-computer interaction, IEEE Transactions on Software Engineering, SE-11 (1985) 699-713.