

17. Let an intelligent machine explain its decisions

More and more decisions that traditionally were taken by humans, are taken by intelligent machines that perform complex reasoning. An automatic pilot can fly and even land an airplane. A medical expert system can propose diagnoses and treatments of patients based on their symptoms. In current systems, only the results of the automatic reasoning are shown to the user. This makes it hard for the user to understand and trust the results.



Our demo shows how a user of a safety and security system uses visualization to understand why and how an automatic reasoning system has reached its conclusions. This allows the user to gain both a better understanding of the situation and to improve trust in the reasoning system.

ICT science question

How can we best visualize the reasons why an automatic reasoning system has come up with certain conclusions? The combination of the use of probabilistic reasoning and subsequent visualization of the reasons behind the decision is new and especially important in costly and safety critical situations.

Application

Our current application area is the safety and security domain. No known products offer visualization of the reasons behind the decisions.



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COMMIT/ project
METIS Dependable Cooperative Systems for Public Safety

Alternative Application

Any system employing automatic reasoning is a potential application. This is especially relevant in systems where automatic reasoning takes high impact decisions. For example: computer aided diagnosis systems are used to control the state of an aircraft. If the automated system indicates that an engine should be replaced, then a human would be expected to be able to carefully check the reasoning behind such a costly and safety critical decision.



Before one trusts complex high-tech critical decision support systems, they need to visualize their line-of-reasoning.



How to visualize the decision and reasoning rationale of complex decision support systems.



New insights in visualizing the internal line-of-machine-reasoning for complex decision support systems.



Visualization of the inner line-of-reasoning of a state-of-the-art reasoning technique.

