Protecion Strategies for Open Information Systems

An alternative approach to traditional access control and privacy preserving algorithms for information policy issues is “information accountability”.

In a world where information is ever more easily copied and improperly passed on even by authorized users, and where automated correlations and inferences across multiple databases can uncover information even when it has not been explicitly revealed, accountability must become a primary means by which society addresses issues of appropriate use. Towards this end we are developing tools for tracking the use of information and identifying privacy policy violations.

Approach and Impact

New approach

• AIR policy language for defining expressive privacy policies
• AIR reasoner generates NL-like explanation for policy decision using dependency tracking
• Justification UI provides a graphical representation of explanations

Research Impact

• Dependency tracking: Reasoner maintains set of premises from which any conclusion was derived using a Truth Maintenance System.
• Reasoning efficiency: nested rules and goal direction
• Customizable explanations: Provides automated and customizable explanations for policy conclusions using dependencies and policy descriptions.

AIR Policy Language

AIR is a rule-based policy language grounded in Semantic Web technologies that can be used to express policies about information access and use. It focuses on generating explanations for policy decisions as they allow end users to understand how the results were obtained, increase trust in the policy decision and enforcement process, and enable policy administrators to ensure the correctness of the policy. Our policy approach (i) provides customizable explanations for policy decisions, (ii) provides more efficient and expressive reasoning through the use of nested sub-rules and goal direction, and (iii) is grounded in Semantic Web technologies.

Justification User Interface

As explanations are usually in the form of proof trees, which might be incomprehensible to end users, we have developed a graphical justification user interface in Tabulator Firefox extension. This allows users to view the explanation provided by the AIR reasoner in different ways: (i) in a simple rule language, N3, (ii) in a graphical layout that highlights the result of the reasoning and shows both the NL explanation as well as specific premises, and (iii) a textual view that presents the information in a format that is expected by lawyers.

AIR Ontology


TAMI: Transparent Accountable Data Mining Initiative

http://dig.csail.mit.edu/TAMI

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