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PRIVACY MANAGEMENT IN ONLINE SOCIAL NETWORKS

Abstract

People are willing to share their personal information in social networks. The users are allowed to create and share content about themselves and others. When multiple entities start distributing content without a control, information can reach unintended individuals and inference can reveal more information about the user. This thesis first categorizes the privacy violations that take place in online social networks. Our proposed approach is based on agent-based representation of a social network, where the agents manage users' privacy requirements by creating commitments with the system. The privacy context, including the relations among users or content types are captured using description logic. We propose a sound and complete algorithm to detect privacy violations on varying depths of social networks. We implement the proposed model and evaluate our approach using real-life social networks.

A content that is shared by one user can very well violate the privacy of other users. To remedy this, ideally, all the users that are related to a content should get a say in how the content should be shared. To enable this, we model users of the social networks as agents that represent their users' privacy constraints as semantic rules. In one line, we propose a reciprocity-based negotiation for reaching privacy agreements among users and introduce a negotiation architecture that combines semantic privacy rules with utility functions. In a second line, we propose a privacy framework where agents use Assumption-based Argumentation to discuss with each other on propositions that enable their privacy rules by generating facts and assumptions from their ontology.

PUBLICATIONS

Journal Papers

1. Dilara Keküllüoğlu, Nadin Kökciyan, and Pınar Yolum. “Preserving Privacy as Social Responsibility in Online Social Networks”. In: *ACM Transactions on Internet Technology (TOIT)* (2017). Being revised.
2. Nadin Kökciyan, Nefise Yaglıkci, and Pınar Yolum. “An Argumentation Approach for Resolving Privacy Disputes in Online Social Networks”. In: *ACM Transactions on Internet Technology (TOIT)* (2017). To appear.
3. Nadin Kökciyan and Pınar Yolum. “PriGuard: A Semantic Approach to Detect Privacy Violations in Online Social Networks”. In: *IEEE Transactions on Knowledge and Data Engineering (TKDE)* 28.10 (2016), pp. 2724–2737.
4. Nadin Kökciyan et al. “Semantic Description of Liver CT Images: An Ontological Approach”. In: *IEEE Journal of Biomedical and Health Informatics (JBHI)* 18.4 (2014), pp. 1363–1369.

Book Chapters

1. Nadin Kökciyan and Pınar Yolum. “PriGuardTool: A Web-Based Tool to Detect Privacy Violations Semantically”. In: *Engineering Multi-Agent Systems (EMAS) Workshop, Revised, Selected, and Invited Papers*. Ed. by Matteo Baldoni et al. Springer, 2016, pp. 81–98.
2. Yavuz Mester, Nadin Kökciyan, and Pınar Yolum. “Negotiating Privacy Constraints in Online Social Networks”. In: ^[1]_[SEP] *Advances in Social Computing and Multiagent Systems: International Workshop on Collaborative Agents Research and Development (CARE), and International Workshop on Multiagent Foundations of Social Computing (MFSC)*. Ed. by Fernando Koch, Christian Guttmann, and Didac Busquets. Springer, 2015, pp. 112–129.

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2. Dilara Keküllüoglu, Nadin Kökciyan, and Pinar Yolum. “A Tool for Negotiating Privacy Constraints in Online Social Networks (Demo Paper)”. In: *European Conference on Artificial Intelligence (ECAI)*. 2016.
3. Dilara Keküllüoglu, Nadin Kökciyan, and Pinar Yolum. “Strategies for Privacy Negotiation in Online Social Networks”. In: *European Conference on Artificial Intelligence (ECAI)*. 2016, pp. 1608–1609.
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5. Nadin Kökciyan. “Privacy Management in Agent-Based Social Networks (Doctoral Consortium)”. In: *AAAI Conference on Artificial Intelligence*. 2016.
6. Nadin Kökciyan, Nefise Yaglikci, and Pinar Yolum. “Argumentation for Resolving Privacy Disputes in Online Social Networks”. In: *Proceedings of the International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*. 2016, pp. 1361–1362.
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8. Nadin Kökciyan. “Privacy Management in Agent-Based Social Networks”. In: *Proceedings of the 2015 International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*. 2015, pp. 2019–2020.
9. Nadin Kökciyan and Pinar Yolum. “Commitment-based privacy management in online social networks”. In: *Multiagent Foundations of Social Computing Workshop at International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*. 2014.

Defense Jury Members

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