

## References

Alberti, M.; *et al.* Mapping Deontic Operators to Abductive Expectations. **Journal of Comput. Math. Organ. Theory**, v.12, Issue 2–3, p.205–225, 2006.

Al-Muhtadi, J.; *et al.* Cerberus: a context-aware security scheme for smart spaces. In: **1<sup>st</sup> IEEE International Conference On Pervasive Computing And Communications** (PerCom 2003), p.489–496, 2003.

Ao, X.; *et al.* Law-Governed Communities Over the Internet. In: 4<sup>th</sup> International Conference on Coordination Models and Languages, **Lecture Notes in Computer Science**, v.1906, p.133–147, 2000.

AOSE. Website of the **9<sup>th</sup> International Workshop on Agent Oriented Software Engineering**. URL: <<http://grasia.fdi.ucm.es/aose08/>>. Accessed on June, 2008.

Artikis, A.; *et al.* Animated specifications of computational societies. In: **1<sup>st</sup> International Joint Conference on Autonomous Agents and Multiagent Systems**, ACM, Italy, p.1053–1061, 2002.

Artikis, A. Executable Specification of Open Norm-Governed Computational Systems. **PhD thesis**, Department of Electrical & Electronic Engineering, Imperial College, 2003.

Avizienis, A.; *et al.* Basic Concepts and Taxonomy of Dependable and Secure Computing. **IEEE Transactions on Dependable and Secure Computing**, v.1, n.1, p.11–33, January-March, 2004.

Baader, F.; *et al.* The **Description Logic Handbook: Theory, Implementation, Applications**. Cambridge University Press, UK, 2003. ISBN 0-521-78176-0.

Bajo, J.; *et al.* Chapter 7. Agent applications in Tourism. **Issues in Multi-Agent Systems - The AgentCities.ES Experience**. Antonio Moreno and Juan Pavón (eds.), Birkhäuser, p.179–206, 2008.

Bechhofer, S.; *et al.* **OWL Web Ontology Language Reference**. Recommendation from W3C since February, 2004. URL: <<http://www.w3.org/TR/owl-ref/>>. Accessed on February, 2008.

Bellifemine, F.; *et al.* Developing multi-agent systems with jade. Castelfranchi, C. and Lesperance, Y. (editors). **Lecture Notes in Artificial Intelligence**, Intelligent Agents VII, n.1571, p.89–103, Springer-Verlag, 2001.

Bellifemine, F.; *et al.* **JADE Programmer's Guide**. CSELT, 2002a, TILab. URL: <<http://jade.csel.it/doc/programmersguide.pdf>>. Accessed on February, 2008.

Bellifemine, F.; *et al.* **JADE Administrator's Guide**. CSELT, 2002b, TILab. URL: <<http://jade.csel.it/doc/administratorsguide.pdf>>. Accessed on February, 2008.

Berezdivin, R.; *et al.* Next-generation wireless communications concepts and technologies. **IEEE Communications Magazine**, 40, p.108–16, 2002.

Berners-Lee, T.; *et al.* The Semantic Web, **Scientific American**. 284(5), p.34–43, May 2001.

- Boella, G.; *et al.* Workshop on Coordination, Organization, Institutions and Norms at the **17<sup>th</sup> European Conference on Artificial Intelligence (COIN@ECAI2006)**, August, 28, 2006a, Riva del Garda, Italy.
- Boella, G.; *et al.* Introduction to normative multiagent systems. **Journal of Comput. Math. Organ. Theory**. v.12, Issue 2–3, p.71–79, 2006b, ISSN 1381-298X.
- Boella, G. and Torre, L. van der. Substantive and Procedural Norms in Normative Multiagent Systems. **Journal of Applied Logic**. 2007.
- Boissier, O.; *et al.* International Workshop on Organizations in Multi-Agent Systems FROM ORGANIZATIONS TO ORGANIZATION ORIENTED PROGRAMMING IN MAS at the **4<sup>th</sup> International Conference on Autonomous Agents and Multiagent Systems (OOP@AAMAS2005)**, July, 2005, the Netherlands.
- Bouquet, P.; *et al.* C-OWL: Contextualizing Ontologies. In: **2<sup>nd</sup> International Semantic Web Conference (ISWC-03), Lecture Notes on Computer Science**, n.2870, p.164–179, Springer Verlag, 2003.
- Bradshaw, J.; *et al.* KAoS. Toward an Industrial-Strength Open Agent Architecture. **Software Agents**, J.M. Bradshaw (Ed.), AAAI Press, p.375–418, 1997.
- Breitman, K.K.; *et al.* Using Ontologies to Formalize Services Specifications. In: Multi-Agent Systems, **3<sup>rd</sup> NASA - Goddard/ IEEE Workshop FAABS III**, Formal Approaches to Agent-Based Systems. Greenbelt, MA. 2004.
- Breitman, K. K.; *et al.* CATO - A Lightweight Ontology Alignment Tool. In: **17<sup>th</sup> Conference on Advanced Information Systems Engineering (CAiSE '05)**, 2005, Porto, Portugal. CAiSE Revised Short Paper Proceedings, v.161, p.83–88, 2005. ISBN 972-752-078-2.
- Breitman, K.; *et al.* Semantic Web: Concepts, Technologies and Applications. **NASA Monographs on Systems and Software Engineering Series**. First Edition. Springer Verlag London. v.1. 2007. 329 pp. ISBN 978-1846285813.
- Bresciani, P.; *et al.* Tropos: an agent-oriented software development methodology. **Journal of Autonomous Agents and Multi-Agent Systems**, v.8, n.3, p.203–236, 2004.
- Broersen, J.; *et al.* Designing a Deontic Logic of Deadlines. **Lecture Notes in Artificial Intelligence**, v.3065. Springer-Verlag. 2004.
- Castelfranchi, C.; *et al.* Deliberative Normative Agents: Principles and Architecture. In: **Agent Theories, Architectures, and Languages (ATAL-99)**, p.364–378, 1999.
- Castelfranchi, C. Engineering Societies in the Agents World. **Lecture Notes in Computer Science**, Engineering Social Order, Springer, p.1–18, 2000.
- Castelfranchi, C. and Falcone, R. Founding Autonomy: The Dialectics between (Social) Environment and Agents Architecture and Powers. **Lecture Notes in Artificial Intelligence**, 2969, p.40–54, 2004.
- Cervenka, R.; *et al.* AML: Agent Modeling Language toward industry-grade agent-based modeling. Agent-Oriented Software Engineering V, **Lecture Notes in Computer Science**, v.3382, p.31–46, 2005.
- Chen, H.; *et al.* Intelligent agents meet the semantic web in smart spaces. **IEEE Internet Computing**. 8(06). p.69–79, 2004.
- Chopinlaud, C.; *et al.* Prevention of harmful behaviors within cognitive and autonomous agents. In: **7<sup>th</sup> European Conference on Artificial Intelligence (ECAI'06)**, p.205–209, 2006.

COIN. Website of the **Coordination, Organization, Institutions and Norms in agent systems workshop**. URL: <<http://www.pcs.usp.br/~coin/>>. Accessed on July, 2008.

Collins, H. *et al.* The **Supply Chain Management Game for the 2007 Trading Agent Competition**, CMU-ISRI-07-100, 2007. URL: <<http://www.sics.se/tac/tac07scmspec.pdf>>. Accessed on February, 2008.

Collins, J. AAI-07 Workshop on **Trading Agent Design and Analysis (TADA-07)**, 2007, Vancouver, British Columbia, URL: <<http://tac.cs.umn.edu/tada07>>. Accessed on February, 2008.

Conte, R. and Castelfranchi, C. Understanding the Functions of Norms in Social Groups through Simulation. Gilbert, N. and Conte, R. (eds.), **Artificial Societies: The Computer Simulation of Social Life**, p.252–267, 1995, UCL Press.

CORBA. Website of the **Common Object Request Broker Architecture**. URL: <<http://www.sei.cmu.edu/str/descriptions/corba.html>>. Accessed on July, 2008.

Corkill, D.D. and Lesser, V. The use of meta-level control for coordination in a distributed problem solving network. Bond, A.H. and Gasser, L. (eds.). In: **8<sup>th</sup> International Joint Conference on Artificial Intelligence**, p.748–756, Federal Republic of Germany, Morgan Kaufmann Publishers. 1983.

Coutinho, L. dos R.; *et al.* Modeling organization in MAS: a comparison of models. In: **1<sup>st</sup> Workshop on Software Engineering for Agent-Oriented Systems (SEAS'05)**, Uberlândia, MG, Brazil, October, 2005.

Coutinho, L. dos R.; *et al.* Modeling Dimensions for Multi-Agent Systems Organizations. Dignum, V. (ed.), **Multi-Agent Systems: Semantics and Dynamics of Organizational Models book**, IGI global, Extended Abstract. URL: <<http://people.cs.uu.nl/virginia/book/omas.htm>>. Accessed on February, 2008a.

Coutinho, L. *et al.* Model-Driven Integration of Organizational Models. In: **9<sup>th</sup> International Workshop on Agent Oriented Software Engineering (AOSE@AAMAS08)**, 2008b, Portugal.

Dam, K. and Winikoff, M. Evaluating an Agent-Oriented approach for Change Propagation. In: **9<sup>th</sup> International Workshop on Agent Oriented Software Engineering (AOSE@AAMAS08)**, 2008, Portugal.

Dastani, M.; *et al.* Role-Assignment in Open Agent Societies. In: **2<sup>nd</sup> International Joint Conference on Autonomous Agents and Multiagent Systems**, ACM Press, p.489–496, 2003.

Davidsson, P.; *et al.* Using the Analytic Hierarchy Process for Evaluating Multi-agent System Architecture Candidates. In: **6<sup>th</sup> International Workshop on Agent Oriented Software Engineering**, 2005, the Netherlands.

Depke, R.; *et al.* Roles in Agent-Oriented Modeling. **International Journal of Software Engineering and Knowledge Engineering**. 11(3), p.281–302, 2001.

Dey, A. Understanding and using context. **Personal and Ubiquitous Computing**, 5(1), p.4–7, 2001, ISSN: 1617-4909.

Dignum, F. Autonomous Agents with Norms. **Artificial Intelligence & Law**, 7(1), p.69–79, 1999.

Dignum, F. Abstract Norms and Electronic Institutions. In: **International Workshop on Regulated Agent-Based Social Systems: Theories and Applications (RASTA'02)**, p.93–104. Bologna, Italy, 2002.

Dignum, V. A Model for Organizational Interaction: based on Agents, founded in Logic, SIKS Dissertation Series 2004–1, **PhD Thesis**, SIKS, 2004.

Dignum, V.; *et al.* Workshop on Coordination, Organization, Institutions and Norms at the **5<sup>th</sup> International Conference on Autonomous Agents and Multiagent Systems** (COIN@AAMAS2006), May 09, 2006, Japan.

Dignum, F.; *et al.* Open Agent Systems??? In: **8<sup>th</sup> International Workshop on Agent Oriented Software Engineering**, 2007, USA.

Dignum, V. and Matson, E. Workshop on Coordination, Organization, Institutions and Norms at the **23<sup>rd</sup> Conference on Artificial Intelligence** (COIN@AAAI2008), July 13-14, 2008, Chicago, USA.

Esteva, M.; *et al.* ISLANDER: an electronic institutions editor. **International Conference on Autonomous Agents and Multiagent Systems**, p.1045–1052, 2002.

Esteva, M. Electronic Institutions: from specification to development. N. 19 in the Monograph Series of the Institut d'Investigació en Intelligència Artificial (IIIA), **PhD thesis**, Technical University of Catalonia, 2003.

Esteva, M.; *et al.* AMELI: An Agent-based Middleware for Electronic Institutions. In: **3<sup>rd</sup> International Joint Conference on Autonomous Agents and Multiagent Systems**, p.236–243, 2004.

FACT. Website of the **Fast Classification of Terminologies**. URL: <<http://www.cs.man.ac.uk/~horrocks/FaCT/>>. Accessed on May, 2008.

Fasli, M. The **TADA/AMEC joint workshop at AAMAS 2006** - Trading Agent Design and Analysis & Agent Mediated Electronic Commerce VIII, Japan, 2006, URL: <<http://cswww.essex.ac.uk/staff/mfasli/eventorganisation/TADA-AMEC-06/TADA-AMEC06.htm>>. Accessed on February, 2008.

Felicíssimo, C.: Semantic Web Interoperability: One strategy for the Taxonomic Ontology Alignment. **Master Dissertation** in PUC-Rio. August, 2004. Brazil. [http://www2.dbd.puc-rio.br/pergamum/tesesabertas/0220943\\_04\\_pretextual.pdf](http://www2.dbd.puc-rio.br/pergamum/tesesabertas/0220943_04_pretextual.pdf).

Felicíssimo, C. H.; *et al.* From Roles Modeled by Using the MESSAGE Methodology to their Implementation with the ASF Framework. **AAAI Fall Symposium: Roles, an Interdisciplinary Perspective: Ontologies, Programming Languages, and Multiagent Systems**. AAAI Press. v.1. p.63–67, 2005a.

Felicíssimo, C. H.; *et al.* Normative Ontologies to Define Regulations Over Roles in Open Multi-Agent Systems. **AAAI Fall Symposium: Roles, an Interdisciplinary Perspective: Ontologies, Programming Languages, and Multiagent Systems**. AAAI Press. v.1. p.68-72, 2005b.

Felicíssimo, C. H. and Lucena, C. J. P. de: An Approach to Regulate Open Multi-Agent Systems Based on a Generic Normative Ontology. In: **First SBES'05 International Workshop on Software Engineering for Agent-oriented Systems** (SEAS@SBES'05), 2005c, Uberlândia, Brazil.

Felicíssimo, C. H.; *et al.* Supporting Regulatory Dynamics in Open MAS. In: **AAMAS'06 International Workshop on Coordination, Organization, Institutions and Norms in agent systems** (COIN@AAMAS'06), 2006a, Hakodate, Japan.

Felicíssimo, C. H.; *et al.* An Approach for Contextual Regulations in Open MAS. In: **Eight International Bi-Conference AAMAS'06 International Workshop on AGENT-ORIENTED INFORMATION SYSTEMS** (AOIS@AAMAS'06), p.25–32, 2006b, Hakodate, Japan.

Felicíssimo, C.; *et al.* Regulating Open MAS with DynaCROM. In: **Second SBES'06 International Workshop** on Software Engineering for Agent-oriented Systems (SEAS@SBES'06), 2006c, Brazil.

Felicíssimo, C.; *et al.* Informing Regulatory Dynamics in Open MAS. Post Proceedings of the Workshop on Coordination, Organization, Institutions and Norms in Agent Systems II at the International Joint Conference on Autonomous Agents and Multiagent Systems (COIN@AAMAS '06), **Lecture Notes in Computer Science**, v.4386, p.147–162, 2007, ISBN: 978-3-540-74457-3.

Felicíssimo, C.; *et al.* Providing Contextual Norm Information in Open Multi-Agent Systems. Post Proceedings of the 8<sup>th</sup> International Bi-Conference Workshop on AGENT-ORIENTED INFORMATION SYSTEMS IV, **Lecture Notes in Computer Science**, v.4898, p.19–36, 2008a, ISBN: 978-3-540-77989-6.

Felicíssimo, C. H.; *et al.* Contextualizing Normative Open Multi-Agent Systems. In: **23<sup>rd</sup> Annual ACM Symposium on Applied Computing** (ACM SAC 2008), Fortaleza, Brazil, March 16-20, 2008b.

Felicíssimo, C. H.; *et al.* Supporting Agents in Intelligent Environments with Protocol Information. In: **4<sup>th</sup> International Conference on Intelligent Environments** (IE'08), Seattle, USA, July, 21-22, 2008c.

Felicíssimo, C.; *et al.* DynaCROM: An Approach to Implement Regulative Norms in Normative Multiagent Systems. In: 3<sup>th</sup> DEON'08 International Workshop on Normative Multiagent Systems of the **9<sup>th</sup> International Conference on Deontic Logic in Computer Science** (NorMAS@DEON'08). Luxembourg, 2008d.

Felicíssimo, C.; *et al.* How to Concretize Norms in NMAS? An Operational Normative Approach Presented with a Case Study from the Television Domain. In: **AAAI'08 International Workshop** on Coordination, Organization, Institutions and Norms in agent systems (COIN@AAAI'08). USA, 2008e.

Ferber, J.; *et al.* Organization Models and Behavioral Requirements Specification for Multi-Agent Systems. In: **4<sup>th</sup> International Conference on Multi-Agent Systems** (ICMAS 2000), IEEE Computer Society, p.387–388, 2000.

Ferber, J.; *et al.* From Agents to Organizations: an Organizational View of Multi-Agent Systems. In: Agent-Oriented Software Engineering IV (AOSE, 2003), **Lecture Notes in Computer Science**, v.2935, p.214–230, 2003.

Ferber, J.; *et al.* Towards an integral approach of organizations in multi-agent systems: the MASQ approach. Part of the book **Multi-agent Systems: Semantics and Dynamics of Organizational Models**. IGI. To appear in March, 2009.

Finin, T.; *et al.* DRAFT Specification of the **KQML Agent-Communication Language plus example agent policies and architectures**. DARPA Knowledge Sharing Initiative External Interfaces Working Group, 1993, URL: <<http://www.cs.umbc.edu/kqml/kqmlspec/spec.html>>. Accessed on February, 2008.

FIPA. Website of the **Foundation for Intelligent Physical Agents**. URL: <<http://www.fipa.org>>. Accessed on July, 2008.

FIPA ACL. Website of the **FIPA ACL Message Structure Specification**, URL: <<http://www.fipa.org/specs/fipa00061/SC00061G.html>>. Accessed on July, 2008.

FIPA\_Contract-Net. Website of the **FIPA Contract Net Interaction Protocol Specification**. URL: <<http://www.fipa.org/specs/fipa00029/SC00029H.html>>. Accessed on July, 2008.

Fornara, N.; *et al.* Agent communication and artificial institutions. **Journal of Agents and Multi-Agent Systems**, v.14, p.121–142, 2007.

- Gaertner, D.; *et al.* Distributed Norm Management in Regulated Multi-Agent Systems. In: **6<sup>th</sup> International Joint Conference on Autonomous Agents and Multiagent Systems**, p.624–631, 2007.
- García-Camino, A.; *et al.* A Distributed Architecture for Norm-Aware Agent Societies. In: **Declarative Agent Languages and Technologies (DALT'05)**, 2005.
- García-Camino, A.; *et al.* Norm-Oriented Programming of Electronic Institutions: A Rule-based Approach. In: **AAMAS'06 Workshop on Coordination, Organization, Institutions and Norms in agent systems**, 2006, Japan.
- Gascuña, J. and Fernández-Caballero, A. Prometheus and INGENIAS Agent Methodologies: A Complementary Approach. In: **9<sup>th</sup> International Workshop on Agent Oriented Software Engineering**, 2008, Portugal.
- Gasser, L.; *et al.* **Distributed Artificial Intelligence**, chapter MACE: A flexible test-bed for distributed AI research, p.119–152, Pitman Publishers, 1987.
- Giménez-Lugo; *et al.* Addressing the social components of knowledge to foster communitary exchanges. **International Journal on Web Based Communities**, 1(2), p.176–194, 2005.
- Gómez, A.; *et al.* Definition of Process Models for Agent-based Development. In: **9<sup>th</sup> International Workshop on Agent Oriented Software Engineering (AOSE@AAMAS08)**, 2008, Portugal.
- Gomez-Sanz, J.; *et al.* Testing and debugging of MAS interactions with INGENIAS. In: **9<sup>th</sup> International Workshop on Agent Oriented Software Engineering (AOSE@AAMAS08)**, 2008, Portugal.
- Gonzalez-Palacios, J. and Luck, M. Extending Gaia with Agent Design and Iterative Development. In: **8<sup>th</sup> International Workshop on Agent Oriented Software Engineering (AOSE@AAMAS07)**, 2007, Hawaii.
- Grizard, A.; *et al.* A peer-to-peer normative system to achieve social order. In: **AAMAS'06 Workshop on Coordination, Organization, Institutions and Norms in agent systems (COIN@AAMAS-2006)**, 2006, Japan.
- Grossi, D. and Dignum, F. From Abstract to Concrete Norms in Agent Institutions. In: **3<sup>rd</sup> NASA Workshop on Formal Approaches to Agent-Based Systems (FAABS III)**, USA. **Lecture Notes in Computer Science**, v.3228, p.12–29, 2004, ISBN: 978-3-540-24422-6.
- Grossi, D.; *et al.* Classificatory Aspects of Counts-as: An Analysis in Modal Logic. In: **Journal of Logic and Computation**, v.16, n.5, p.613–643, 2006.
- Grossi, D.; *et al.* A Formal Road from Institutional Norms to Organizational Structures. In: **AAMAS'07**, Hawaii, USA, 2007.
- Gruber, T. R. A translation approach to portable ontology specifications. In: **Knowledge Acquisition**, 5(2), p.199–220, 1993, ISSN: 1042-8143.
- Hannoun, M.; *et al.* MOISE: An organizational model for multi-agent systems. In: **International Joint Conference, 7<sup>th</sup> Ibero-American Conference on AI, 15<sup>th</sup> Brazilian Symposium on AI (IBERAMIA/SBIA'2000)**, Brazil, **Lecture Notes in Artificial Intelligence**, v.1952, p.152–161, 2000.
- Hendler, J. Agents and the Semantic Web. In: **IEEE Intelligent Systems**, n.2, v.16, p.30–37, 2001.
- Henricksen, K. and Indulska, J. Developing context-aware pervasive computing applications: models and approach. **Pervasive and Mobile Computing**, 2005.

- Hewitt, C. Open Information Systems Semantics for Distributed Artificial Intelligence. **Artificial Intelligence**, v.47(1-3), p.79–106, 1991, ISSN:0004-3702.
- Hübner, J. F.; *et al.* A model for the structural, functional, and deontic specification of organizations in multiagent systems. In: *Advances in Artificial Intelligence: 16<sup>th</sup> Brazilian Symposium on Artificial Intelligence (SBIA 2002)*. Brazil, 2002. **Lecture Notes in Artificial Intelligence**, v.2507. p.118–128, Berlin, Springer. 2002.
- Hübner, J.F.; *et al.* S-MOISE+: a middleware for developing organised multi-agent systems. In: *International Workshop on Organizations in Multi-Agent Systems, from Organizations to Organization Oriented Programming in MAS (OOP'2005)*. **Lecture Notes in Computer Science**, v.3913. 2006.
- Hübner, J.F. and Boissier, O. Workshop on Coordination, Organization, Institutions and Norms at the **7<sup>th</sup> International Conference on Autonomous Agents and Multiagent Systems** (COIN@AAMAS2008), May 12-13, 2008, Portugal.
- IOP. Website of the OMG's **Internet Inter-ORB Protocol**, a brief description. URL: <<http://www.omg.org/library/iop4.html>>. Accessed on July, 2008.
- JADE. Website of the **JAVA Agent DEvelopment Framework**. URL: <<http://jade.tilab.com>>. Accessed on July, 2008.
- Janson, S.; *et al.* **Workshop on Trading Agent Design and Analysis**, Scotland, 2005, URL: <<http://www.sics.se/tada05/cfp.html>>. Accessed on July, 2008.
- JAVA. Website of the **JAVA Language Specification**, 2006, ISBN 0-201-31008-2. URL: <<http://java.sun.com>>. Accessed on July, 2008.
- JAVA RMI. Website of the **JAVA Remote Method Invocation**. URL: <<http://java.sun.com/javase/technologies/core/basic/rmi/index.jsp>>. Accessed on July, 2008.
- JENA. Website of **Jena – A Semantic Web Framework for JAVA**. URL: <<http://jena.sourceforge.net/>>. Accessed on July, 2008.
- Jennings, N.; *et al.* A Roadmap of Agent Research and Development. **Journal of Agents and Multi-Agent Systems**, v.1, p.7–38, 1998.
- Jennings, N. R. On Agent-Based Software Engineering. **Artificial Intelligence**, 117(2), p.277–296, 2000.
- Jennings, N. R. An agent-based approach for building complex software systems. **Communications of the ACM**, 44(4), p.35–41, 2001.
- Jones, A.J.I. and Sergot, M. On the characterization of law and computer systems: the normative systems perspective. **Deontic Logic in Computer Science**, 1993.
- Kagal, L. and Finin, T. Modeling conversation policies using permissions and obligations. **Journal of Agents and Multi-Agent Systems**, v.14, p.187–206, 2007.
- Khedr, M. and Karmouch, A. ACAI: Agent-Based Context-aware Infrastructure for Spontaneous Applications. **Journal of Network & Computer Applications**, 28(1), p.19–44, 1995.
- Kraus, S. and Singh, M. In: **4<sup>th</sup> International Conference on Autonomous Agents and Multiagent Systems** (AAMAS2005), July, 2005, the Netherlands.
- Lemaître C. and Excelente, C. B. Multi-agent organization approach. In: **2<sup>nd</sup> Iberoamerican Workshop on DAI and MAS**, Spain, 1998.
- Lindemann, G.; *et al.* Agents, Norms and Institutions for Regulated Multiagent Systems at the **4<sup>th</sup> International Conference on Autonomous Agents and Multiagent Systems** (ANIREM@AAMAS2005), July, 2005, the Netherlands.

- Mayfield, J.; *et al.* Evaluating KQML as an agent communication language. **Intelligent Agents II**, p.347–360, 1995.
- Martín, F. J.; *et al.* An infrastructure for agent-based systems: An interagent approach. **International Journal of Intelligent Systems**, 15(3), p.217–240, 2000.
- McBurney, P. *et al.* **The CAT Tournament: Market Based Control, distributed resource allocation in complex computational systems**. URL: <[http://www.marketbasedcontrol.com/blog/index.php?page\\_id=5](http://www.marketbasedcontrol.com/blog/index.php?page_id=5)>. Accessed February, 2008.
- Minsky, N. H. and Rozenshtein D. A law-based approach to object oriented programming. In: **Conference on Object Oriented Programming Systems Languages and Applications**, p.482–493, 1987.
- Minsky, N. and Ungureanu, V. Law-Governed Interaction: A Coordination & Control Mechanism for Heterogeneous Distributed Systems. In: **ACM Transactions on Software Engineering and Methodology**, v.9, n.3, p.273–305, July, 2000.
- Minsky\_LGI. Website of the **Law Governed Interaction (LGI): A Distributed Coordination and Control Mechanism (An Introduction and a Reference Manual)**, URL: <<http://www.cs.rutgers.edu/~minsky/papers/manual.pdf>>. Accessed on July, 2008.
- Minsky\_MOSES. The **MOSES** toolkit. URL:<<http://www.moses.rutgers.edu/>>. Accessed on July, 2008.
- Minsky\_Publications. Website with the list of **publications of prof. Minsky, N. H.** URL: <<http://www.cs.rutgers.edu/~minsky/pubs.html>>. Accessed on July, 2008.
- Molina, M.; *et al.* Ubiquitous Computing for Mobile Environments. In: **Issues in Multi-Agent Systems - The AgentCities**. ES Experience, p.33–57, 2008.
- Murata, T. Petri nets: Properties, analysis and applications. In: **IEEE** 77(4), p.541–580, 1989.
- Noriega, P. Agent-Mediated Auctions: The Fishmarket Metaphor. IIIA Monograph Series, Institut d'Investigació en Intel·ligència Artificial. **PhD thesis**. 1997.
- Noriega, P. and Padget, J. In: **Workshop on Coordination, Organization, Institutions and Norms at the Multi-Agent Logics, Languages, and Organisations** — Federated Workshops (COIN@MALLOW2007), p.3–4, 2007, Uk.
- North, D. Institutions, Institutional change and Economics Performance. **Cambridge**, U.P., 1990.
- Noy, N. and Rector, A. (eds.): Defining N-ary Relations on the Semantic Web: Use with Individuals, 2007, URL: <<http://www.w3.org/TR/swbp-n-aryRelations>>. Accessed on February, 2008.
- Nwana, H. S.; *et al.* ZEUS: a toolkit and approach for building distributed multi-agent systems. Etzioni, O., Müller, J.P. and Bradshaw, J.M. (eds). In: **3<sup>rd</sup> International Conference on Autonomous Agents**, p.360–361, 1999, USA, ACM Press.
- Odell, J.; *et al.* Extending UML for agents. In: Agent-Oriented Information Systems Workshop at the **17<sup>th</sup> National Conference on Artificial Intelligence**, p.3–17, 2000.
- Omicini, A. Soda: Societies and infrastructures in the analysis and design of agent-based systems. In: Agent-Oriented Software Engineering, **Lecture Notes in Artificial Intelligence**, v.1957, p.185–193, 2001.
- OnLineDictionary. URL: <<http://dictionary.reference.com/>>. Accessed on September, 2008.



Ontoviz. The Website of the **Ontoviz Protégé plugin**. URL: <<http://protege.cim3.net/cgi-bin/wiki.pl?OntoViz>>. Accessed on February, 2008.

Ossowski, S. and Sichman, J.S. Workshop on Coordination, Organization, Institutions and Norms at the **6<sup>th</sup> International Conference on Autonomous Agents and Multiagent Systems**, May 14-18, 2007, Honolulu, Hawaii, USA.

Padham, L.; *et al.* A Unified Graphical Notation for AOSE? In: **9<sup>th</sup> International Workshop on Agent Oriented Software Engineering**, 2008, Portugal.

Paes, R.; *et al.* Specifying Laws in Open Multi-Agent Systems. In: **Agents, Norms and Institutions for Regulated Multi-agent Systems Workshop (ANIREM@AAMAS'05)**. 2005.

Paes, R.; *et al.* A middleware for governance in open multi-agent systems. In: PUC-Rio **Technical Report: MCC 33**, 2006. Brazil. URL: <<http://wiki.les.inf.puc-rio.br/uploads/8/87/Mlaw-mcc-agosto-06.pdf>>. Accessed on February, 2008.

Paes, R.; *et al.* Enhancing the Environment with a Law-Governed Service for Monitoring and Enforcing Behavior in Open Multi-Agent Systems. In: **Environments for Multi-Agent Systems. Lecture Notes in Artificial Intelligence**, v.4389, p.221–238, 2007a.

Paes, R. de B.; *et al.* Using Interaction Laws to Implement Dependability Explicit Computing in Open Multi-Agent Systems. In: “Simpósio Brasileiro de Engenharia de Software” (SBES 2007), XXI, Brazil. 2007b.

Pattison, H.E.; *et al.* Distributed Artificial Intelligence, chapter **Instantiating Descriptions of Organizational Structure**, p.59–96, Pitman Publishers, 1987.

PELLET. Website of the **Open Source OWL DL Reasoner**. URL: <<http://pellet.owldl.com/>>. Accessed on May, 2008.

Poslad, S.; *et al.* The fipa-os agent platform: Open source for open standards. In: **5<sup>th</sup> International Conference and Exhibition on the Practical Application of Intelligent Agents and MultiAgents**, p.355–368, 2000.

RACER. Website of the **Renamed Abox and Concept Expression Reasoner** software. URL: <<http://www.sts.tu-harburg.de/~r.f.moeller/racer/>>. Accessed on May, 2008.

Ranganathan, A. and Campbell, H. A Middleware for Context-Aware Agents in Ubiquitous Computing Environments. In: **ACM/IFIP/Usenix International Middleware Conference**. Springer-Verlag, 2003.

Rocha, R. M. da. A Framework for Service Negotiation Simulation in Next Generation Wireless Networks. (“Um Framework para Simulação da Negociação de Serviços em Redes Sem Fio de Nova Geração”, in Portuguese). **Master Dissertation** in PUC-Rio, March, 2008, Brazil.

Rodríguez-Aguilar, J.A. On the Design and Construction of Agent-mediated Electronic Institutions, **PhD thesis**, Universitat Autònoma de Barcelona, 2001.

Rougemaille, S.; *et al.* Methodology Fragments Definition in SPEM for Designing Adaptive Methodology: a First Step. In: **9<sup>th</sup> International Workshop on Agent Oriented Software Engineering**, 2008, Portugal.

Rubinsztein, H.K.; *et al.* Support for Context-Aware Collaboration. **Lecture Notes in Computer Science**, v. Mobility Aware Technologies and Applications, p.37–47, 2004, ISBN 978-3-540-23423-4.

Satyanarayanan, M. Pervasive Computing: Vision and Challenges. In: **IEEE Personal Communications**, p.10–17, 2001.

- Schilit, B. and Theimer, M. Disseminating Active Map Information to Mobile Hosts. In: **IEEE Network**, 8(5), p.22–32, 1994.
- Scott, W. R. **Organizations: rational, natural and open systems**. Upper Saddle River, NJ: Prentice Hall. 1998.
- Serban, C.; *et al.* Establishing Enterprise Communities. In: **5<sup>th</sup> IEEE International Enterprise Distributed Object Computing Conference**. USA, September 2001.
- Sichman, J. and Demazeau, Y. **On social reasoning in multi-agent systems**. “Revista Iberoamericana de Inteligencia Artificial”, (13) Verano, p.68–84, 2001. URL: <<http://citeseer.ist.psu.edu/480992.html>>. Accessed on June, 2008.
- Silva, V. T. da; *et al.* Taming Agents and Objects in Software Engineering. In: **Software Engineering for Large-Scale Multi-Agent Systems. Lecture Notes in Computer Science**, v.2603, p.1–26, 2003.
- Silva, V. T. da; *et al.* An Object-Oriented Framework for Implementing Agent Societies. Inf.MCC 32, 2004 **technical report** from the MCC series of PUC-Rio, Rio de Janeiro, Brazil, September, 2004a. 39 p.
- Silva, V. T. da and de Lucena, C.J.P. From a conceptual framework for agents and objects to a multi-agent system modeling language. **Journal of Autonomous Agents and Multi-Agent Systems**, v.9(1-2), p.145–189, 2004b, ISSN 1387-2532.
- Silva, V. T. da. From a Conceptual Framework for Agents and Objects to a Multi-Agent System Modeling Language. **PhD Thesis**. Advisor: Prof. de Lucena, C. J. P., Computer Science Department, PUC-Rio, Brazil, March 2004c.
- Silva, V. T. da. From the specification to the implementation of norms: an automatic approach to generate rules from norms to govern the behavior of agents. In: **Journal of Autonomous Agents and Multi-Agent Systems**, v.17(1), p.113–155, 2008, ISSN: 1387-2532.
- Silva, V. T. da; *et al.* MAS-ML: a multiagent system modelling language. In: **International Journal of Agent-Oriented Software Engineering**, v.2(4), p.382–421, 2008.
- Simon, H. A. *The Sciences of the Artificial*. **MIT Press**. 1996.
- TAC. Website of the **Trading Agent Competition**. URL: <<http://www.sics.se/tac/>>. Accessed on July, 2008.
- Taveter, K. and Sterling, L. An Expressway from Agent-Oriented Models to Prototype Systems. In: **8<sup>th</sup> International Workshop on Agent Oriented Software Engineering (AOSE@AAMAS07)**, 2007, USA.
- Thomas, G. and Williams, A. B. Roles in the Context of Multiagent Task Relationships. **AAAI Fall Symposium** “Roles, an Interdisciplinary Perspective: Ontologies, Programming Languages, and Multiagent Systems”, TR FS-05-08, ISBN: 978-1-57735-254-9, 2005.
- Ungureanu, V. and Minsky, N. Establishing Business Rules for Inter-Enterprise Electronic Commerce. In: **14<sup>th</sup> International Symposium on Distributed Computing. Lecture Notes in Computer Science**, v.1914, p.179–193, 2000.
- Vasconcelos, W.; *et al.* Resolving Conflict and Inconsistency in Norm-Regulated Virtual Organizations. In: **International Joint Conference on Autonomous Agents and Multiagent Systems**, p.14–18, 2007.

Vázquez-Salceda, J. and Dignum, F. Modelling electronic organizations. In: Multi-Agent Systems and Applications III. **Lecture Notes in Artificial Intelligence**, v.2691, p.584–593, 2003.

Vázquez-Salceda, J.; *et al.* Implementing Norms in Multiagent Systems. In: Multiagent System Technologies, **Lecture Notes in Computer Science**, v.3187, p.313–327, 2004, ISBN: 978-3-540-23222-3.

Vázquez-Salceda, J.; *et al.* Organizing Multiagent Systems. In: **Journal of Autonomous Agents and Multi-Agent Systems**, 11(3), p.307–360, 2005.

Viterbo, J.; *et al.* Applying Regulation to Ubiquitous Computing Environments. In: Second **SBES'06 International Workshop** on Software Engineering for Agent-oriented Systems (SEAS@SBES'06), 2006, Florianopolis, Brazil.

Viterbo, J.; *et al.* Ubiquitous Service Regulation Based on Dynamic Rules. In: **13<sup>th</sup> IEEE International Conference on Engineering of Complex Computer Systems** (ICECCS 2008). Northern Ireland. 2008.

Weiser, M. The computer for the twenty-first century. In: **Scientific American**, 265(3). p.94–104. September, 1991.

Wellman, M. The **TAC Classic Game Overview**, URL: <<http://www.sics.se/tac/page.php?id=3>>. Accessed on February, 2008.

Werner, E. **Distributed Artificial Intelligence**. Chapter Cooperating Agents: A Unified Theory of Communication and Social Structure, p.3–36, 1987.

Weyns, D.; *et al.* Environment as a first class abstraction in multiagent systems. In: **Journal of Autonomous Agents and Multi-Agent Systems** (JAAMAS, 07), v.14(1), p.5–30, 2007, ISSN: 1387-2532.

Winikoff, M. and Padgham, L. Developing Intelligent Agent Systems: A Practical Guide. Published by **John Wiley and Sons**. 230p. 2004. ISBN: 0-470-86120-7.

Wooldridge, M. and Jennings, N. Intelligent Agents: Theory and Practice. In: **Knowledge Engineering Review**, 10(2), p.115–152, 1995.

Wooldridge, M. Agent-based software engineering. In: **IEE Proc. Software Engineering**, 144(1), p.26–37, 1997.

Wooldridge, M.; *et al.* The Gaia Methodology for Agent- Oriented Analysis and Design. In: **Journal of Autonomous Agents and Multi-Agent Systems**, v.3(3), p.285–312, 2000.

WordNet. Website of **WordNet**. URL: <<http://wordnet.princeton.edu/>>. Accessed on July, 2008.

Wright, G.H.v. Deontic Logic. In: **Mind New Series**, v.60(237), p.1–15, 1951.

Zambonelli, F.; *et al.* Organizational Rules as an Abstraction for the Analysis and Design of Multi-Agent Systems. In: **International Journal of Software Engineering and Knowledge Engineering** 11(3), p.303–328, 2001.

Zambonelli, F. and Parunak, H. Signs of a Revolution in Computer Science and Software Engineering. In: **Third International Workshop Engineering Societies in the Agents World**, Madrid, Spain, 2002.

## Appendix A: List of the Thesis Publications

The work presented in this thesis summarizes the result of many discussions about: different interpretations and point-of-views of the author, her advisors and their co-authors of the papers submitted; feedbacks received from presentations done in national and international academic events and also from reviews received to the papers submitted; (re-)implementations; etc.

The experience gotten over the last four years of research has been reported in the following publications and also has been presented to the research community in all opportunities in which an invitation was done.

### Book Chapters

- Felicíssimo, C. *et al.* Providing Contextual Norm Information in Open Multi-Agent Systems. Post Proceedings of the Eight International Bi-Conference Workshop on AGENT-ORIENTED INFORMATION SYSTEMS IV (AOIS@AAMAS'06), **Lecture Notes in Computer Science** (LNCS 4898), Springer-Verlag volume, p.19–36, 2008a, ISBN: 978-3-540-77989-6.
- Felicíssimo, C. *et al.* Informing Regulatory Dynamics in Open MAS. Post Proceedings of the Workshop on Coordination, Organization, Institutions and Norms in agent systems at the International Joint Conference on Autonomous Agents and Multiagent Systems (COIN@AAMAS '06), **Lecture Notes in Computer Science** (LNCS 4386), Springer-Verlag volume, p.147–162, 2007, ISBN: 978-3-540-74457-3.

## Conferences

- Felicíssimo, C. H. *et al.* Contextualizing Normative Open Multi-Agent Systems. In: 23rd Annual **ACM Symposium on Applied Computing** (ACM SAC 2008), Fortaleza, Brazil, March 16-20, 2008b.
- Felicíssimo, C. H. *et al.* Supporting Agents in Intelligent Environments with Protocol Information. In: 4th **International Conference on Intelligent Environments** (IE'08), Seattle, USA, July, 21-22, 2008c.

## Workshops

- Felicíssimo, C.; Briot, J.-P.; Chopinaud, C.; Lucena, C.: DynaCROM: An Approach to Implement Regulative Norms in Normative Multiagent Systems. In the third **DEON'08 International Workshop** on Normative Multiagent Systems (NorMAS 2008). In: Ninth International Conference on Deontic Logic in Computer Science (NorMAS@DEON'08). Luxembourg, 15–18 July, 2008d.
- Felicíssimo, C.; Briot, J.-P.; Chopinaud, C.; Lucena, C.; Viterbo, J.: How to Concretize Norms in NMAS? An Operational Normative Approach Presented with a Case Study from the Television Domain. In: **AAAI'08 International Workshop** on Coordination, Organization, Institutions and Norms in agent systems (COIN@AAAI'08). Chicago, USA, 13-14, July, 2008e.
- Felicíssimo, C. H. *et al.* Supporting Regulatory Dynamics in Open MAS. In: **AAMAS'06 International Workshop** on Coordination, Organization, Institutions and Norms in agent systems (COIN@AAMAS'06), 2006a, Hakodate, Japan.
- Felicíssimo, C. H. *et al.* An Approach for Contextual Regulations in Open MAS. In: Eight International Bi-Conference **AAMAS'06 International Workshop** on AGENT-ORIENTED INFORMATION SYSTEMS (AOIS@AAMAS'06), 2006b, Hakodate, Japan. p. 25-32.

- Felicíssimo, C.; Lucena, C.; Briot, J.-P.; Choren, R.: Regulating Open MAS with DynaCROM. In: **Second SBES'06 International Workshop on Software Engineering for Agent-oriented Systems (SEAS@SBES'06)**, 2006c, Florianopolis, Brazil.
- Viterbo, J.; Felicíssimo, C.; Briot, J.-P.; Endler, M.; Lucena, C.: Applying Regulation to Ubiquitous Computing Environments. In: **Second SBES'06 International Workshop on Software Engineering for Agent-oriented Systems (SEAS@SBES'06)**, 2006, Florianopolis, Brazil.
- Felicíssimo, C. H. and Lucena, C. J. P. de: An Approach to Regulate Open Multi-Agent Systems Based On A Generic Normative Ontology. In: **First SBES'05 International Workshop on Software Engineering for Agent-oriented Systems (SEAS@SBES'05)**, 2005c, Uberlândia, Brazil.

### Short Papers

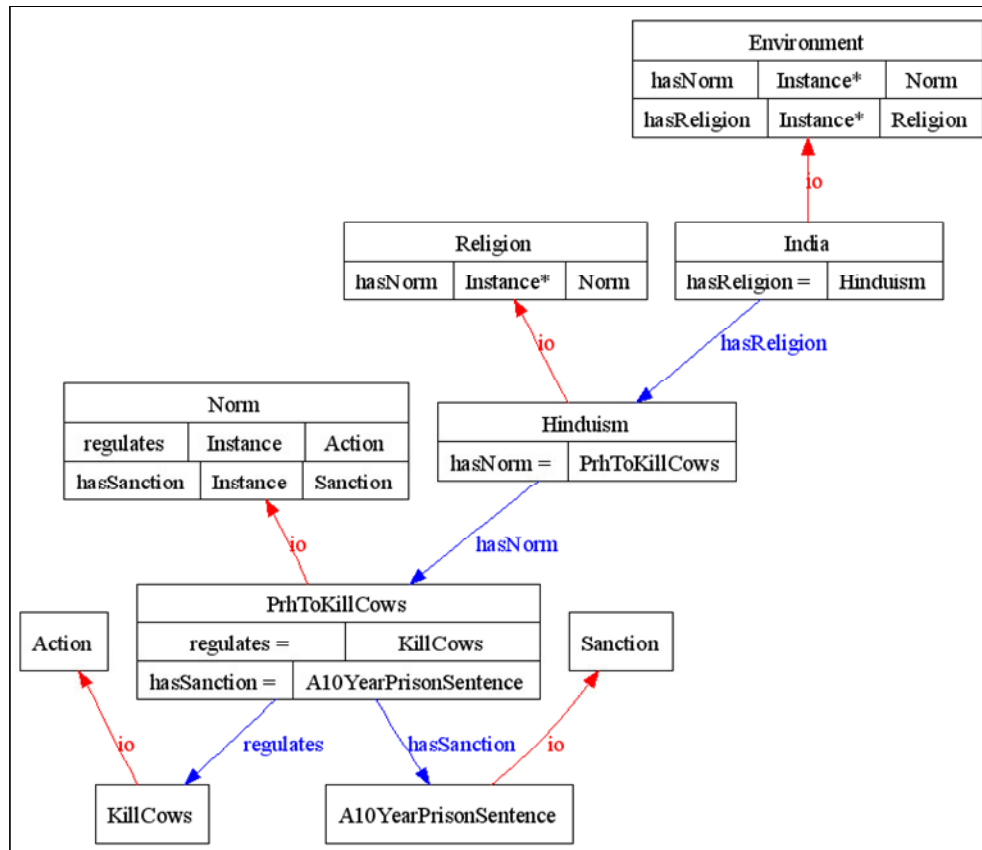
- Felicíssimo, C. H., de Lucena, C. J. P., Silva, V. T. da. From Roles Modeled by Using the MESSAGE Methodology to their Implementation with the ASF Framework. In: **AAAI Fall Symposium: Roles, an Interdisciplinary Perspective: Ontologies, Programming Languages, and Multiagent Systems**. 2005, Arlington, Virginia. Menlo Park, California 94025: AAAI Press, 2005a. v.1. p.63–67.
- Felicíssimo, C. H. *et al.* Normative Ontologies to Define Regulations Over Roles in Open Multi-Agent Systems. In: **AAAI Fall Symposium: Roles, an Interdisciplinary Perspective: Ontologies, Programming Languages, and Multiagent Systems**. 2005, Arlington, Virginia. Menlo Park, California 94025: AAAI Press, 2005b. v.1. p.68-72.

## Appendix B: Source Code of a DynaCROM Specification

In this appendix, the source code created for representing the religious norm: “in the Hinduism religion, it is prohibited to kill cows” is presented.

### Appendix B.1. Part of the a DynaCROM Ontology File

The religious norm is represented in an OWL-DL ontology file. Figure 13 (reproduced below) illustrates the norm and its code is as follows.



Code 35. The OWL-DL source code created for representing a DynaCROM religious norm

```

<?xml version="1.0"?>
<rdf:RDF
  xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema#"
  xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#"
  xmlns:owl="http://www.w3.org/2002/07/owl#"
  xmlns="http://www.owl-
ontologies.com/dynaCROMCowExample.owl#"
  xml:base="http://www.owl-
ontologies.com/dynaCROMCowExample.owl">
  <owl:Ontology rdf:about=""/>
  <owl:Class rdf:ID="Religion"/>
  <owl:Class rdf:ID="Norm">
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:cardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#int"
>1</owl:cardinality>
        <owl:onProperty>
          <owl:ObjectProperty rdf:ID="hasSanction"/>
        </owl:onProperty>
      </owl:Restriction>
    </rdfs:subClassOf>
  <rdfs:subClassOf
rdf:resource="http://www.w3.org/2002/07/owl#Thing"/>
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:cardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#int"
>1</owl:cardinality>
        <owl:onProperty>
          <owl:ObjectProperty rdf:ID="regulates"/>
        </owl:onProperty>
      </owl:Restriction>
    </rdfs:subClassOf>
  </owl:Class>
  <owl:Class rdf:ID="Sanction"/>
  <owl:Class rdf:ID="Environment"/>
  <owl:Class rdf:ID="Action"/>
  <owl:ObjectProperty rdf:about="#regulates">
    <rdfs:range rdf:resource="#Action"/>
    <rdfs:domain rdf:resource="#Norm"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="hasReligion">
    <rdfs:range rdf:resource="#Religion"/>
    <rdfs:domain rdf:resource="#Environment"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="hasNorm">
    <rdfs:domain>
      <owl:Class>
        <owl:unionOf rdf:parseType="Collection">
          <owl:Class rdf:about="#Environment"/>
          <owl:Class rdf:about="#Religion"/>
        </owl:unionOf>
      </owl:Class>
    </rdfs:domain>
    <rdfs:range rdf:resource="#Norm"/>
  </owl:ObjectProperty>

```



```

<owl:ObjectProperty rdf:about="#hasSanction">
  <rdfs:domain rdf:resource="#Norm"/>
  <rdfs:range rdf:resource="#Sanction"/>
</owl:ObjectProperty>
<owl:DatatypeProperty rdf:ID="hasPeriod"/>
<Norm rdf:ID="PrhToKillCows">
  <regulates>
    <Action rdf:ID="KillCows"/>
  </regulates>
  <hasSanction>
    <Sanction rdf:ID="A10YearPrisonSentence"/>
  </hasSanction>
</Norm>
<Religion rdf:ID="Hinduism">
  <hasNorm rdf:resource="#PrhToKillCows"/>
</Religion>
<Environment rdf:ID="India">
  <hasReligion rdf:resource="#Hinduism"/>
</Environment>
</rdf:RDF>

<!-- Created with Protege (with OWL Plugin 2.1, Build 284)
http://protege.stanford.edu -->

```

## Appendix B.2. Part of a DynaCROM Rule File

Code 36 presents the JENA source code created for composing religious norms with environment norms. For instance, the “*PrhToKillCows*” religious norm codified above is composed with the norms of the *India* environment.

Code 36. The JENA source code created for composing religious norms with environments norms

```

@prefix ontologyURI: <http://www.owl-
ontologies.com/dynaCROMCowExample.owl#>.
@include <RDFS>.ontologyURI

####
[ruleForEnvWithReligiousNorms:
  (?Environment ontologyURI:hasReligion ?EnvReligion)
  (?EnvReligion ontologyURI:hasNorm ?ReligiousNorms)
  -> (?Environment ontologyURI:hasNorm ?ReligiousNorms)]
####

```