Empirical norm adaptation
in a P2P sharing network scenario

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Overview

- Abstract and introduction
- P2P sharing network scenario
- Encountered issues and open questions
Abstract

• Within MAS, organizational approaches are designed to constrain the scope of possible interactions among agents. In addition to roles and protocols, norms have proven to be effective means of regulating participants’ activities.

• Nevertheless, changes in the environment and/or agents’ behaviours can cause a decrease in their effectiveness. Thus, a run time norm adaptation may help the system to better fulfill its social objectives.

• Empirical studies on specific scenarios may represent a first step towards a formalization of the norm adaptation process. With this perspective, our research focuses on an empirical study over a P2P multi-agent based simulation scenario.
• How to improve existing MAS?
  – **Assistance layer** (MetaLevel) on top of Domain Level
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Overview

• Abstract and introduction
• P2P sharing network scenario
• Encountered issues and open questions
• DL = peer agents sharing data
• ML = assistant agents for peer clusters
• Agents at ML perceive environmental and DL agent properties and adapt Norms at DL
• DL Norms:
  – normFriends\textsubscript{DL}: “a peer cannot send data to more than maxFriends peers simultaneously”
    • To control the number of served peers
  – normBW\textsubscript{DL}: “a peer cannot use more than maxBW bandwidth percentage”
    • To further control the network usage
P2P sharing network scenario

- Norm adaptation: Assistants
  - compute desired new norm values
    - To align serving bandwidth with receiving one
    - To decrease net saturation
  - agree on new values
  - inform their peer agents about new norms
P2P sharing network scenario

Implementation: P2P simulator
Overview

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Empirical approach

Norm adaptation in an implemented case study

- How to specify norms so that external agents can be informed and understand them?
  - Language specifications, parameterizations,…

- Enforcement policies. Agents do comply with norms?
  - Norms / rules / constraints…
  - Always, probabilities, individual preferences, utility funct

- **How to adapt norms?**
  - design/run time?
  - Ad hoc, heuristics, learning…

- **Based on what?**
  - System evolution, environment, agent status,…
Empirical approach

Norm adaptation in an implemented case study

• When to adapt norms?
  – Interval, goal fulfillment,…
  – How can norms influence agents’ behaviour

• **Who decides?**
  – Participant agents, agents with privileges, trusted agents, internal agents,…

• What **cost** do adaptation has?
  – Message costs? Adaption intervals?…

• How norm changes are **adopted**?
  – Retrospective application? Transition period? …