# Agent Mediated Information Exchange

## Child Safety Online

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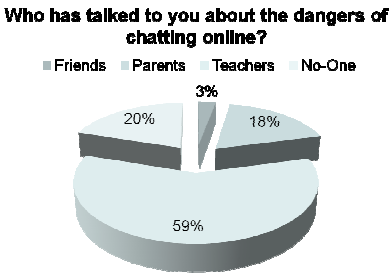
### Abstract

*This poster presents a tool for agent-mediated information exchange between users/children while chatting online. The Internet plays a significant role in the lives of children today by opening up a whole new world. It provides excellent educational opportunities, access to a huge range of information and can be fun. However, it also plays a role in the abuse of children in a variety of ways. We are aware of the potential for paedophiles to misuse modern technology to abuse children's trust by attempting to contact them through chat rooms. Hence, there is a need to automate the process of monitoring information exchange when children chat on-line.*

**Keywords**: *Multi-agent System, JADE, Protégé, Ontology, Online Safety, Agent-Based Paradigm, Reactive, Intelligent Agents, Knowledge management, Mobile Agents, JADE- Leap*

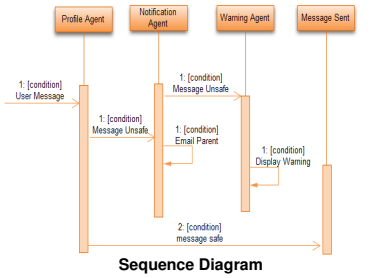
### Background Information

Research into the way children interact online was carried out, which involved a survey of 437 school children between the ages of 11 and 13 on their internet chat habits. 59% of those who took part regularly chatted to people over the internet.

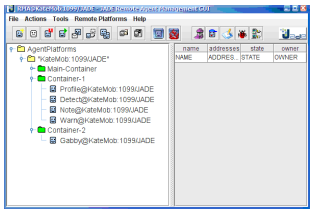



Even recently, highly publicised cases of young people going missing as a result of meeting strangers contacted online, have come to light which suggests that the problem is not being resolved with any great success.

### Multi-Agent System Development in the Java Agent Development Framework (JADE)



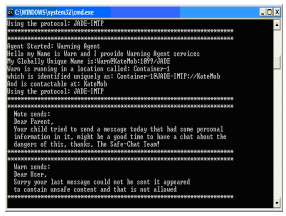

Sequence Diagram



JADE Remote Management Agent GUI

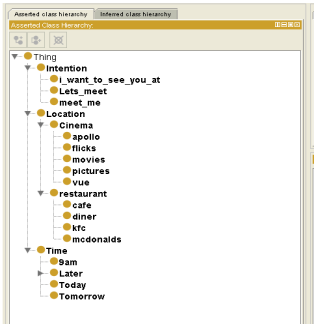
```
public void action() {
    doWait(2500); //we sleep here
    ACLMessage msg = receive();
    System.out.println(msg);
    if (msg!=null){
        String text=msg.getContent();
        if (text.equals("47 green street")){
        ACLMessage msg1 = new ACLMessage(ACLMessage.INFORM);
        msg1.addReceiver(new AID("Rose", AID.ISLOCALNAME));
        msg1.setLanguage("English");
        msg1.setContent("bad");
        send(msg1);
        finished = true;
        doWait(2500);
    }
else{
System.out.println("**********************************************************");
System.out.println(" *agetLocalName()+"The message was good:No action taken!");
System.out.println("**********************************************************");
block();
    }
```

Code snippet from Profile Agent



Result of a Message Interception

### Ontology Development Using Protégé

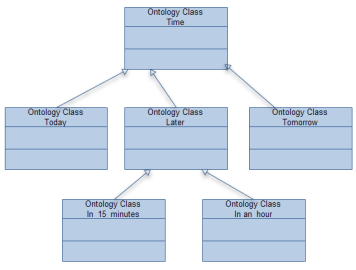



Class creation in Protégé

A possible solution to detecting meeting arrangements in a message or conversation, would be to develop an ontology that the agent could use to recognize proposed meetings. Ontology is a formal description of all the objects, rules and relationships within a particular domain of knowledge.

We are in the process of building an ontology domain in protégé, which will have three classes ***intentions, locations,*** and ***times***. If these three classes are identified in a message or conversation action can be taken. The protégé ontology, once linked with the JADE agents, would enable the detection agent to take the appropriate steps to block the message or end the conversation.

The ontology would have to be updated frequently but this would be the case for any language based solution because of the nature of language; it evolves constantly.




Class Diagram for Time Ontology

### Conclusions and Future Work

- We have researched the issues associated with child safety online
- We have developed a prototype for an agent-mediate autonomous system that is able to automatically block the transmission of personal data, such as addresses and telephone numbers to other users, if such data is detected in a message.
- This multi-agent system was modeled using UML and implemented in the JADE Framework
- We are in the process of developing a meeting detection agent, using protégé ontology and JADE
- This agent will detect and prevent meeting arrangements being made between users of the multi-agent system
- We plan to investigate the application of a Natural Language Processing based solution to our Agent Mediated Information Exchange
- We will then be able to evaluate which of the two solutions would be most effective in the real time dynamic of online interaction.
- We can then work towards the research and development of a mobile solution using JADE Leap technology

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