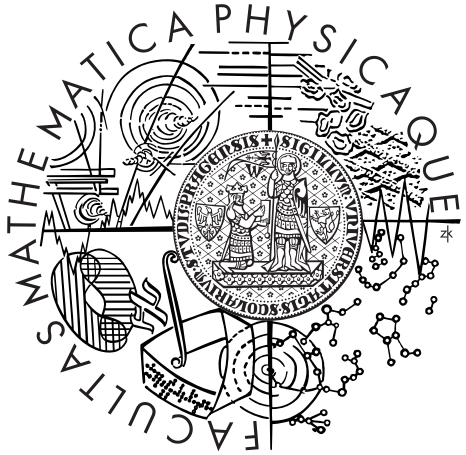
Charles University in Prague
Faculty of Mathematics and Physics

MASTER THESIS



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Multiagent Systems and Organizations

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Study programme:	Computer science (N1801)
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I would like to express my gratitude ...

I declare that I carried out this master thesis independently, and only with the cited sources, literature and other professional sources.

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Prague, February 3, 2012 Lukáš Kúdela

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Abstract: One way to attack a problem is to imagine how a human organization would go about solving it and model this organization as a multiagent system (MAS). The problem with this approach lies in the simple fact that no single agreed-upon (standard) notion of organization currently exists in the field of MAS. In practice, this means that every agent can, in principle, talk to/with any other agent regardless of whether this is desirable or even allowed within the modelled organization. However, this is seldom the case in the real world. Here all organizations but the simplest ones are usually structured into sub-organizations (branches, divisions, departments, etc.) which can be further decomposed. They define roles and interaction protocols. The individual members of the organization assume these roles after meeting declared requirements. They follow the interaction protocols associated with the role to fulfill its responsibilities. The aim of this presentation is to demonstrate how the concepts related to organizational structure (oranization, role, player) can be introduced as first-class citizens of MAS (just like the concept of Agent) and present a metamodel that defines their structural and behavioral relationships.

Keywords: multiagent systems, organizations, roles, metamodel

Názov práce: Multiagentové systémy a organizácie
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Abstrakt: Bla bla bla

Kľúčové slová: multiagentové systémy, organizácie, role, metamodel

Contents

Introduction

Chapter 1

Autonomous Agents and Multiagent Systems

1.1 Autonomous Agents

- Are there non-autonomous agents?

1.2 Multiagent Systems

Chapter 2

Problem Solving using Organizations

"The achievements of an organization are the results of the combined effort of each individual."
– Vince Lombardi, American football coach

- human organization multiagent system
- advantages: straightforward, intuitive
- human organizations have structure
- no standard way to impose structure upon MAS (poor/weak model problem)
- poor/weak problem solutions

Chapter 3

Poor Model Problem and its Solutions

Chapter 4

Modelling Organizations – Platform-Independent Model

Chapter 5

Modelling Organizations – Platform-Dependent Model

Chapter 6

Examples

6.1 Example 1: Function Invocations

6.2 Example 2: Expression Evaluation

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List of Abbreviations

MAS - Multiagent system

Attachments

Appendix A

CD-ROM Contents

The contents of the attached CD-ROM are as follows:

- `Contact Details.txt` – the author's contact details.