

# AUTONOMOUS SYSTEMS

## SEMINAR 02

Literature research and state of the art

Martina Husáková

# How to act in case of the project?

- **Phase 1: Topics of projects**
- **Phase 2: Literature research, state of the art**
- Phase 3: Mind mapping
- Phase 4: PEAS, ODD+D
- Phase 5: MAS conceptualisation
- Phase 6: Verification and validation

# Phase 1: Topics of projects

<b>1</b>	<b>Social insects as the multi-agent system</b>
<b>2</b>	<b>Rescue operations with autonomous robots</b>
<b>3</b>	<b>Bots as intelligent agents in computer games</b>
<b>4</b>	<b>Automated robot gardener</b>
<b>5</b>	<b>Intelligent e-learning system based on multi-agent paradigm</b>
<b>6</b>	<b>Intelligent home</b>
<b>7</b>	<b>Simulator of viral (bacterial) infection</b>
<b>8</b>	<b>Own topic for the project</b>

Please see [TopicsForProjects-2018.pdf](#) (Ukazky)

# Literature (re)search

- To receive collection of suitable literature sources for preparation of more or less scientific work (e. g. seminar work, bachelor or diploma thesis, ...)
- It is necessary to browse huge amount of information sources, especially library catalogs, scientific databases, ...
- Literature (re)search is necessary for writing of the state of the art for our topic

# Literature (re)search for aAUTS

- It is necessary to find **min. 5** specialised sources in scientific databases for our project
- These sources have to be read by a student and according to it a student will write a state of the art about selected topic (review)
- Length of a state of the art: 2 pages A4 min.
- Where should I write it? → Protocol for the project
  - **Do not change a formatting style in the protocol!**

# Literature (re)search for aAUTS

## Scientific databases


- <https://www.uhk.cz/cs-CZ/UHK/Centralni-pracoviste/Univerzitni-knihovna/Database-a-e-zdroje#UHK-Article>

- Springer
- ScienceDirect
- Scopus

**No Wikipedia!!!**

Search results: 318 results found for pub-date > 2009 and  
(Multi-agent system for rescue operations)[All  
Sources(Computer Science)].

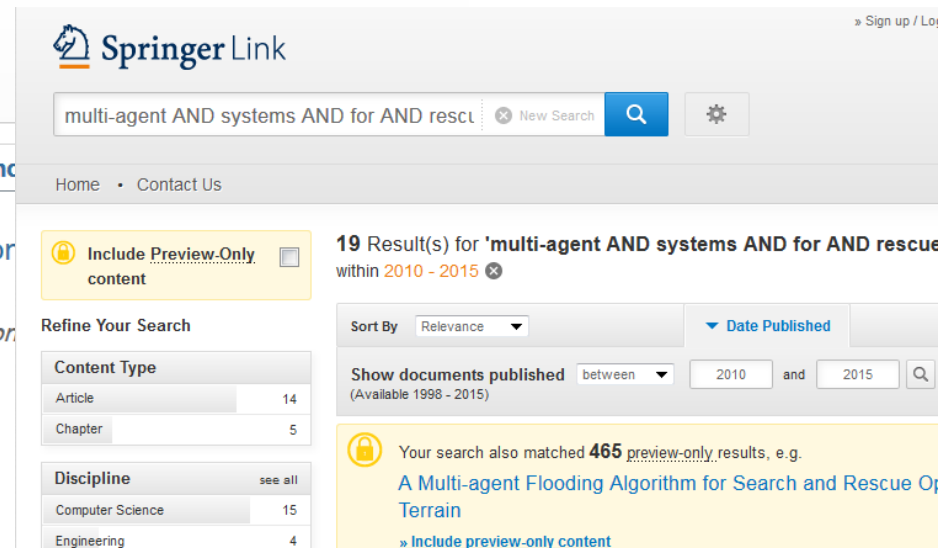
 Purchase |  Export |  Relevance

 Chapter 6 - Studying the Impact of the Organization  
Operations Control

*Advances in Artificial Transportation Systems and Simulation*  
Nuno Machado, António J.M. Castro, Eugénio Oliveira

 Abstract |  Purchase PDF - \$31.50

<http://www.sciencedirect.com/>



Springer Link

multi-agent AND systems AND for AND rescue

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19 Result(s) for 'multi-agent AND systems AND for AND rescue' within 2010 - 2015

Sort By: Relevance | Date Published

Show documents published between 2010 and 2015

Your search also matched 465 preview-only results, e.g. [A Multi-agent Flooding Algorithm for Search and Rescue Operations on Terrain](#)

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Content Type	
Article	14
Chapter	5
Discipline	
Computer Science	15
Engineering	4

<http://link.springer.com/>

# Negative example

## Domain: Social insects - Bees

- „Bees are one of the most interesting social insects. Bees divide their activities dynamically. Bees behave collectively and accomodate their behaviour according to environmental conditions. They have photographical memory. ...“
- „I am focused on the bee Queen which is responsible for ...“
- **A student did not mention any literature sources related with the multi-agent systems. He only presented what the bees are and how they behave. He also mentioned the scope of his project, but especially this should not be a part of the state of the art.**

# Quite positive example

## Domain: Intelligent home

- Smart home is the residential extension of building automation and involves the control and automation of lighting, heating (such as smart thermostats), ventilation, air conditioning, and security, as well as home appliances such as washer/dryers, ovens or refrigerators/freezers that use WiFi for remote monitoring. The usage of multi-agent systems for design of intelligent smart home is relevant and useful because of the many interacting entities which are distributed at smart home.“
- AmlHomCare is one of the applications using the multi-agent systems (a citation is missing). This system uses cameras for analysis of behaviour of people at home. ... ..,
- MUBAI (Multiagent Biometrics for Ambient Intelligence) (a citation is missing) is the next possible application using several independent agents which are able to ...
- **The student focused on general description of smart homes topic and mentioned already existed applications of smart homes, but only two of them. It is not enough. He did not mention citations!**



# Positive example

## Domain: Simulator of viral infection in a lymph node

- The immune system, due to its very complex nature, is one of the most challenging topics in biology. Its study often relies on *in vivo* or *in vitro* animal models, mathematical models, or computational (*in silico*) models. A number of mathematical models based on either differential equations or interacting discrete entities (*agents*) have also been proposed to describe various aspects of the immune system.
- The study of the **evolution of HIV into AIDS**, for instance, **has been modeled** with the purpose of predicting the effects of specific treatments, and predicting certain aspects of disease progression [*cit.*].
- One of the first attempts to define a detailed agent-based model of immunological mechanisms was the work of **Celada and Seiden** [*cit.*]. Their goal was to capture the dynamics of the immune system.
- Recently, there has been renewed interest in modeling the immune system by means of agent-based models.
- **Simmune** aims at being a flexible platform for the simulation of any immunological process.
- ...

# Recommended structure of a state of the art

- **Structure:**
  - General introduction into the application domain
  - Research papers about your application domain and the multi-agent systems
  - Projects or research teams which are interested in the same application domain and their results
  - Research directions into the future

# Seminar work and homeworks

- Browse literature scientific databases and find min. 5 suitable sources for your project
- Prepare the state of the art
- **Do not forget to cite!**
  - Use Harvard style of citation, see Ukazky directory ... How to cite ... and Seminar nr. 2