APPLICATION AREAS FOR THE PROJECT

Nr.	Name of the project	Description	Student
1	**Social insects as the multi-agent system**	Main aim of this project is to prepare design and analysis of a model for deeper investigation of the inner life of the amazing animals – social insects. Social insects follow very simple rules which often lead to complex behaviour. This model is going to be used for building executable model which can help us with answering particular questions about behaviour of these animals.	
2	**Rescue operations with autonomous robots**	Today, various disasters can appear in our planet, e. g. earthquakes, floods, hurricanes, etc. In these situations, fast and efficient reactions are inevitable for saving human lives. The main aim of the project is to prepare design and analysis of the multi-agent-based system consisting of suitable agents which will be able to effectively assist during disasters. We can suppose that the executable model will be a simulation where we will test these robots in a virtual environment. We can suppose that we will build a model for hardware robots as agents (alternative).	
3	**Bots as intelligent agents in computer games**	The main aim of the project is to prepare design and analysis of the computer game where agents will solve specific problem according to coordinated or cooperated strategies. Select a suitable game where the multi-agent paradigm can be applied.	
4	**Automated robot gardener**	The main aim of the project is to provide multi-agent-based model suitable for care about your garden. Think about suitable agents for efficient management of a garden.	
5	**Intelligent e-learning system based on multi-agent paradigm**	E-learning is a form of online education and learning. Different parts (students, teachers, administrators, etc.) can use this system. Main aim of the project is to prepare design and analysis of the multi-agent-based software (no simulation)	

		which should be used for building of an intelligent e-learning system where participants will save their money and time efficiently during study and education.	
6	**Intelligent home**	The main aim of the model is to propose a multi-agent-based model suitable for intelligent management of devices of a home.	
7	**Simulator of viral (bacterial) infection**	The main aim of the project is to propose the multi-agent-based model which will help with the investigation of an organism during an infection. Thanks to the executable model, we will be able to investigate dynamic interactions between participants of an infection. We will be able to say what can happen with the organism if it is attacked with an infection.	
8	**Own topic for the project**	You can suggest your own topic which can be related to the multi-agent paradigm. The topic has to be different from the topics presented in the seminars. Consult your ideas with the teacher.	

Autonomous Systems (aAUTS) – 2018-2019
DESCRIPTIONS

1. **Social insects as the multi-agent system**: The main aim of the project is to simulate behaviour of the selected social insect (ants, bees, ...) during finding of the food sources and defence against predators, etc.
2. **Realisation of rescue operations with autonomous robots:** The main aim of the project is to propose the multi-agent system that could be used for rescue purposes (detection of injured people, treatment of injured people and their transportation, exploration of an environment where dangerous chemicals (fire) occurred. The system can be also able to communicate with a human for coordinated and cooperated problem solving.
3. **Predator-prey model:** This is a classical example of the multi-agent systems application. There exist at least two groups of agents – predators hunting the preys, and preys trying to survive. Model investigates the dynamics of this system, especially in case of outbraking the population of predators or preys. The model should be able to find the equilibrium of the system. You should concentrate on the design of a behaviour of both types of agents for depicting the real situations in the nature.
4. **Bots as intelligent agents in computer games:** The main aim of the project is to design the multi-agent system consisting of intelligent agents – bots existing in the environment of a computer game. You can be inspired by various computer action/strategic/tactical games where selection of strategy, decision making or learning can occur.
5. **Exploration of foreign environment with the assistance of intelligent robots:** The aim of the project to design the multi-agent system that will be used for example for discovering the living forms on planets, for investigation of places that can be used for future living, for discovering places that were damaged due to the nuclear impact, etc.
6. **Automated robot gardener:** The main aim of the project is to design the multi-agent system for maintenance of a garden, i. e. the artificial gardener will be able to cut of the bushes, cut a grass, water flowers, etc. Propose the corresponding and suitable sensoric and motoric aparature of the agent and suitable functionality for realisation of the intended assignment of the agent.
7. **Own topic**: You can choose some topic that you are interested in and where the multi-agent-based approach can be used. Consult your topic with your teacher.