Homework 1

1. Which are the main national and international conferences and journals about agents?

- JCR http://www.ehu.eus/es/web/biblioteka/datu-baseen-aurkibide-alfabetikoa
- CORE http://portal.core.edu.au/conf-ranks
- Google Scholar http://scholar.google.es
- GII-GRIN-SCIE (GGS) Conference Rating: http://valutazione.unibas.it/gii-grin-scie-rating/
- ...

Conferences

ICAART: http://www.icaart.org/ (Alberto García)

> The purpose of the International Conference on Agents and Artificial Intelligence is to bring together researchers, engineers and practitioners interested in the theory and applications in the areas of Agents and Artificial Intelligence. Two simultaneous related tracks will be held, covering both applications and current research work. One track focuses on Agents, Multi-Agent Systems and Software Platforms, Distributed Problem Solving and Distributed AI in general. The other track focuses mainly on Artificial Intelligence, Knowledge Representation, Planning, Learning, Scheduling, Perception Reactive AI Systems, and Evolutionary Computing and other topics related to Intelligent Systems and Computational Intelligence.

PAAMS

KES AMSTA 2017 (Eneritz Domínguez)

IVA 2017

AAMAS (David Montllor)

> AAMAS also known as International Conference on Autonomous Agents and Multiagent Systems, is the largest and most influential conference in the area of agents and multiagent systems.
>
> The aim of the conference is to bring together researchers and practitioners in all areas of agent technology and to provide a single, high-profile, internationally renowned forum for research in the theory and practice of autonomous agents and

multiagent systems. AAMAS is the flagship conference of the non-profit International Foundation for Autonomous Agents and Multiagent Systems (IFAAMAS).
The AAMAS conference series was initiated in 2002 in Bologna, Italy. Subsequent conferences have been held in New York City, USA (2004); Utrecht, The Netherlands (2005); Valencia, Spain (2012); Paris, France (2014) and São Paulo, Brazil (2017) among others.

IEEE ICA 2017 (Eduardo Pérez)

IEEE ICA 2017 is the second International Conference on Agents organised by the IEEE which took place in Beijing, China. The topics discussed are: multi-agent communication and interaction protocols, machine learning, decision making techniques, human and multi-agent systems interaction,future visions and grand challenges, collective intelligence and so on.

DCAI

Nucl.ai conference:

dedicated to AI in games and Creative Industries. The speakers come from a variety of backgrounds, from AAA studios to indies or research institutions. Participation in on-site sessions and connect personally to some of the best AI developers in the world. You can also follow the conference with streaming services

MLCON 2017 (Imanol Gómez)

It gives you a comprehensive insight into the principles of Machine Learning and introduces to the world of ML tools, programming languages and technologies. Experienced ML speakers from a solid industry background show you how to create real value from Artificial Intelligence using the latest technologies such as Tensorflow, Deep Learning toolkits, Chatbots and many more.

CONFERENCE RANKING (Alberto Garcia)

The CORE portal allow us to have a classification of the international conferences about agents. It's based in a ranking as follow: A*, A, B, C, other. This is the result obtained for the top 20:

1) AAMAS - A* Accepted Papers
2) WI-IAT - B
3) ISEAT - B
4) IVA - B
5) IAWTIC - B
6) PRIMA - B
7) ADMI - B
8) LPMA - B
9) COIN - B
10) MAAMAW - C
11) EUMAS - C
12) IEEE IA - C
13) ICAART - C
14) ICCCI - C
15) KES AMSTA - C
16) HAI - C
17) IWIA -C

18) MABS -C
19) PAAM -Csudo
20) PAAMS - unranked

Journals

2. Which are the main development environments for Multi-Agent Systems?

JADE: Is a software Framework implemented in the Java language. One of his advantages is that a JADE-based System can be distributed across machines which does not need to share the same OS and the configuration can be controlled remotely. We can even change the configuration at run-time by moving agents from one machine to another. JADE is free and open source software, it is distributed under the terms and conditions of the LGPL v2 licence. (Iker García)

AgentBuilder: Is an integrated tool suite for constructing intelligent software agents. AgentBuilder is implemented in Java, and the agents communicate using the Knowledge Query (KQML). AgentBuilder can be accomplished on any machine or operating system that support Java, and the agents created with the AgentBuilder toolkit are Java programs so they can be executed on any Java virtual machine. What characterizes AgentBuilder is that it was designed to allow software developers with no background in intellegent systems or intelligent agents technologies to quickly and easily build intelligent agent-based applications. If we want to use AgentBuilder we need to buy a licence, we have two options, Lite which cost 95$ or Pro which cost 895$. (Iker García)

AgentBuilder: Jack, ZEUS, FIPA-OS, agentTool
ASTRA
JGOMAS
JASON
https://en.wikipedia.org/wiki/Comparison_of_agent-based_modeling_software
BORIS: It's a programming language for multiagent systems development. It's perfect for new programmers due to its minimal learning curve. Mainly it was created as a part of a research project for MAS. (Eneritz Domínguez)

GOAL: It's a multi-agent programming language based on the BDI paradigm (Beliefs, Desires and intentions), a logic-based language that supports modular agent design. It uses Prolog (logical rules and simple facts) to represent the knowledge, beliefs and goals of an agent.

MADKit (Multi-agent Development Kit): a lightweight Java library for designing and simulating Multi-Agent Systems.

DESIRE (DEsign and Specification of Interacting REasoning components) is a compositional development method for multi-agent systems, based on a notion of compositional architecture.

3. Which are the main environments for developing Games with Multi-Agent Systems?

Robocode
OpenAI: A bot which beats the world's top professionals at 1v1 matches of Dota 2 under standard tournament rules.
http://fightcodegame.com/ → It is a web where you can program the artificial intelligence of your own robot and make it fight against other robots programmed by someone else. (Imanol Gómez)

4. Where agent technology is applied? Which systems?

- Videogames
- Car industry

Autonomous cars: (Eritz Yerga Gutierrez)

The final goal of car automation is to create vehicles capable of sensing the environment and navigating without human input. In spite of autonomous driving systems evolving a lot, regulations as of today do not allow full autonomous systems to drive on public roads.
These systems integrate diverse amount of sensors: radars, laser lights, GPS, odometry and different kind of cameras to perform computer vision.
Currently 6 levels of automation are considered: 0 (No automation), 1 (Drive assistance), 2 (Partial automation), 3 (Conditional automation), 4 (High automation) and 5 (Full automation).
Tesla, Waymo (a Google subsidiary), Uber and Mercedes are amongst the companies developing in this research area.

These cars as of today use Bayesian Simultaneous Localization And Mapping (SLAM)

algorithms to fuse data from sensors into an internal map to represent the world. Their visual recognition algorithms use machine vision (including neural networks) to recognise objects via cameras.

- Health
- Traffic Simulation / Modeling
- Biology
- Art, theater museums

- Board games→

On the topic of Multi-agent systems applied to games (and Board Games), I've found a variety of papers about the topic in question, these 2 being the most interesting:

➢ A Multi-Agent System for playing the board game Risk
➢ On using Multi-agent Systems in Playing Board Games

"Computer programs able to play different kinds of games (aka bots) is a growing area of interest for the computer game industry as the demand for better skilled computerized opponents increase. We propose a general architecture of a Multi-agent System (Mas) based bot able to play complex board games and show that this solution is able to outperform other bots in two quite different games, namely no-press Diplomacy and Risk. Based on these results, we formulate a hypothesis of the applicability of Mas based bots in the domain of board games and identify the need for future investigations in the area."

Oscar Aguinagalde

Deep Blue versus Garry Kasparov was a pair of six-game chess matches between world chess champion Garry Kasparov and an IBM supercomputer called Deep Blue. The first match was played in Philadelphia in 1996 and won by Kasparov. The second was played in New York City in 1997 and won by Deep Blue. The 1997 match was the first defeat of a reigning world chess champion by a computer under tournament conditions.

- Communication networksTechnology watching
- Security →Surveillance Routes Planning Mechanism (Eduardo Montero)
- Military → Future Combat System FCS C2

  The FCS C2 system is a revolutionary approach to provide network-centric C2 (Command and Control) with dedicated battlespace visibility and support for a

completely integrated intelligence, surveillance, and reconnaissance (ISR) capability.The system is to be built within an Objective Force consisting of a family of autonomous and non-autonomous vehicles expected to assure command of a battlespace tens of kilometers wide, in three-dimensional space, vertically integrated, and effectively interoperable among allied and joint forces.

- ….
- Economy

5. Topic presentations

https://docs.google.com/document/d/1X1tJA968IW8gAZVldla-JP0Yf1RiBI1lJDhp-YTMwSE

- **Ethical issues of AI**
  - Ander Munarriz and Kristupas Misutis
- **AI in music**
  - Federico Michelotto and Bruno Jiménez Castro
- **Recent Trends in Artificial Intelligence**
  - Manuel Ruiz Garcia, *Cristopher Castro Maya* and Laurenz Seidel
- **The Impact of Artificial Intelligence on Social Media**
  - Lucila Moreno and Carolina Rodriguez
- **AI for Smart Buildings**
  - Isabel Losantos and Egoitz Herrera
- **AI in games**
  - Sebastian Molina and Unai Zabala
- **The Unity Machine Learning Agents Toolkit**
  - Nuño Mugica, C. and Mikel Berganza