



EMEA Workshop 2019
Utrecht, the Netherlands
10-11 October 2019

EMEAWS2019

Coordinators:

Juan Llorens - juan.llorens@uc3m.es

Jean Duprez - jean.duprez@airbus.com

Knowledge Management and Ontologies Session



Agenda

- 1- Introduction to the Session (15 min)
2. Introduction to Knowledge management and Ontologies in general (15 min) (Juan Llorens - UC3M)
3. An Application: Product Lines REUSE case using Knowledge Management Approach:
EU project REVAMP (15 minutes) (Elena Gallego - The Reuse Company)
- 3- Initiatives from the INCOSE central leadership team (90 min)
Knowledge Management Primer: (Robert Nilsson - VOLVO Cars) (20 min)
Knowledge Management in its application to MBSE. (20 min) (Jean Duprez – Airbus)
- 4- Your needs (Rest of time)
- 5- Summary and conclusions (10 min)



Lets Start

JUAN LLORENS





Lets Start

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Spaniards were crazy enough to have a “letter” formed by two letters – LL was a letter until computers came





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Spaniards were crazy enough to have a “letter” formed by two letters – LL was a letter until computers came



Applies to Name: Just
Read

1





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Spaniards were crazy enough to have a “letter” formed by two letters – LL was a letter until computers came



Applies to Name: Just Read

1



Applies to Name: Interpret

7 + An





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Spaniards were crazy enough to have a “letter” formed by two letters – LL was a letter until computers came



Applies to Name: Just Read

1



Applies to Name: Interpret

7 + An



Applies to Family name: Say only the first word of the movie





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Spaniards were crazy enough to have a “letter” formed by two letters – LL was a letter until computers came



Applies to Name: Just Read

1



Applies to Name: Interpret

7 + An



Applies to Family name: Say only the first word of the movie




Applies to Name: The equivalent to Giovanni






Lets Start

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 Spaniards were crazy enough (not anymore, of course) to have a "letter" formed by two letters – LL was a letter until computers came

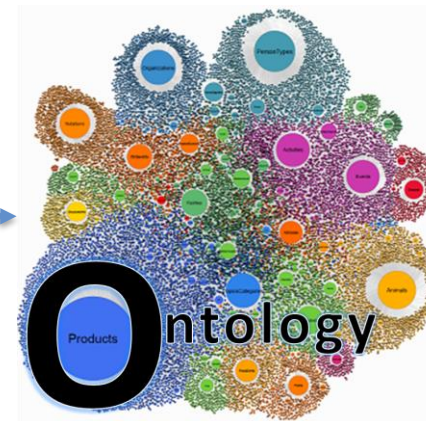
 Applies to Name: Just Read **1**

 Applies to Name: Interpret **7 + An**

 Applies to Family name: Say only the first word of the movie



 Applies to Name: The equivalent to Giovanni



Knowledge

Stored somewhere
(Knowledge Base)



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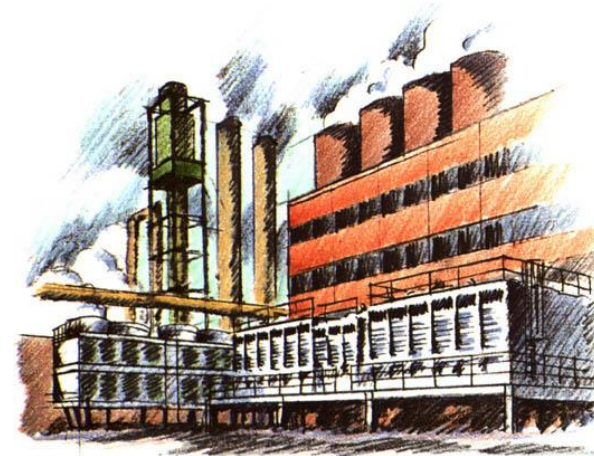
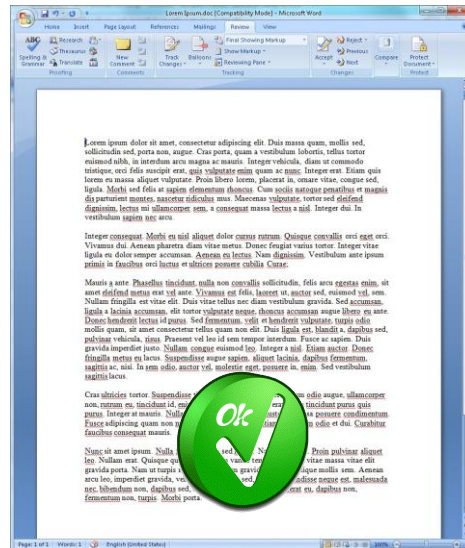
INTENTION OF THE SESSION





Lets Start

REAL INTENTION OF THE SESSION





KNOWLEDGE MANAGEMENT PROCESS - PURPOSE

- The purpose of the Knowledge Management process is to create the capability and assets that enable the organization to exploit opportunities to re-apply existing knowledge.
- KM includes the identification, capture, creation, representation, dissemination, and exchange of knowledge across targeted groups of stakeholders.
- KM efforts typically focus on organizational objectives such as improved performance, competitive advantage, innovation, the sharing of lessons learned, integration, and continuous improvement of the organization
- The motivation for putting KM in place includes:
 - Information sharing across the organization
 - Reducing redundant work due to not having the information needed at the right time
 - Avoiding “reinventing the wheel”
 - Facilitating training, focusing on best practices
 - Capturing knowledge that would “go out the door” with retirements and attrition



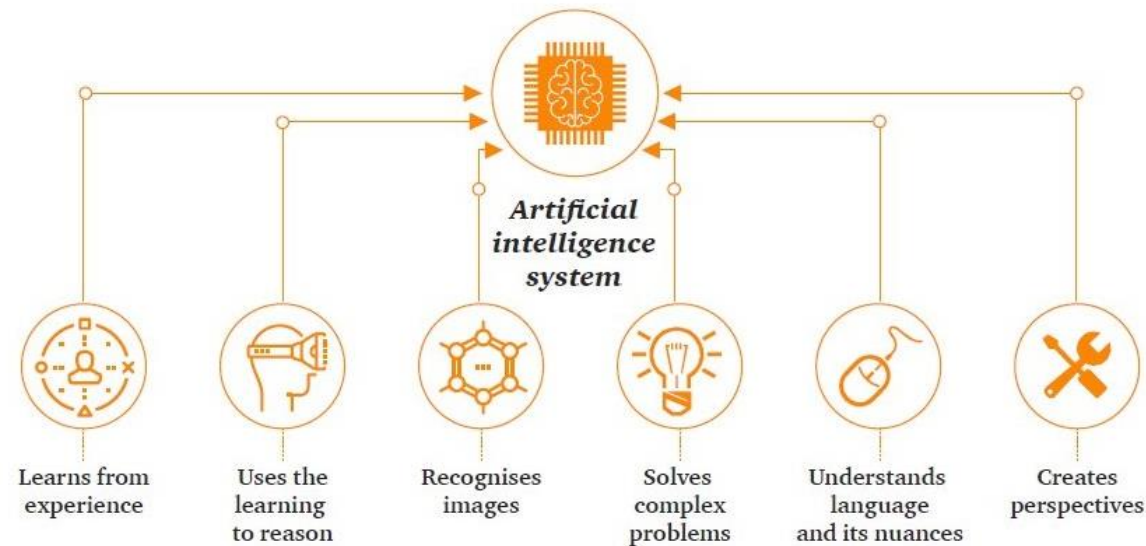
KNOWLEDGE MANAGEMENT PROCESS

- KM is viewed from an organizational project-enabling perspective, that is, how the organization supports the program or project environment with the resources in its KM system.
- The support provided to the project can come in several ways, including:
 - Knowledge captured from technical experts
 - Lessons learned captured from previous similar projects
 - Domain engineering information that is applicable for reuse on the project, such as part of a product line or family of systems
 - Architecture or design patterns that are commonly encountered
 - Other reusable assets that may be applicable to the SOI



What is Artificial Intelligence

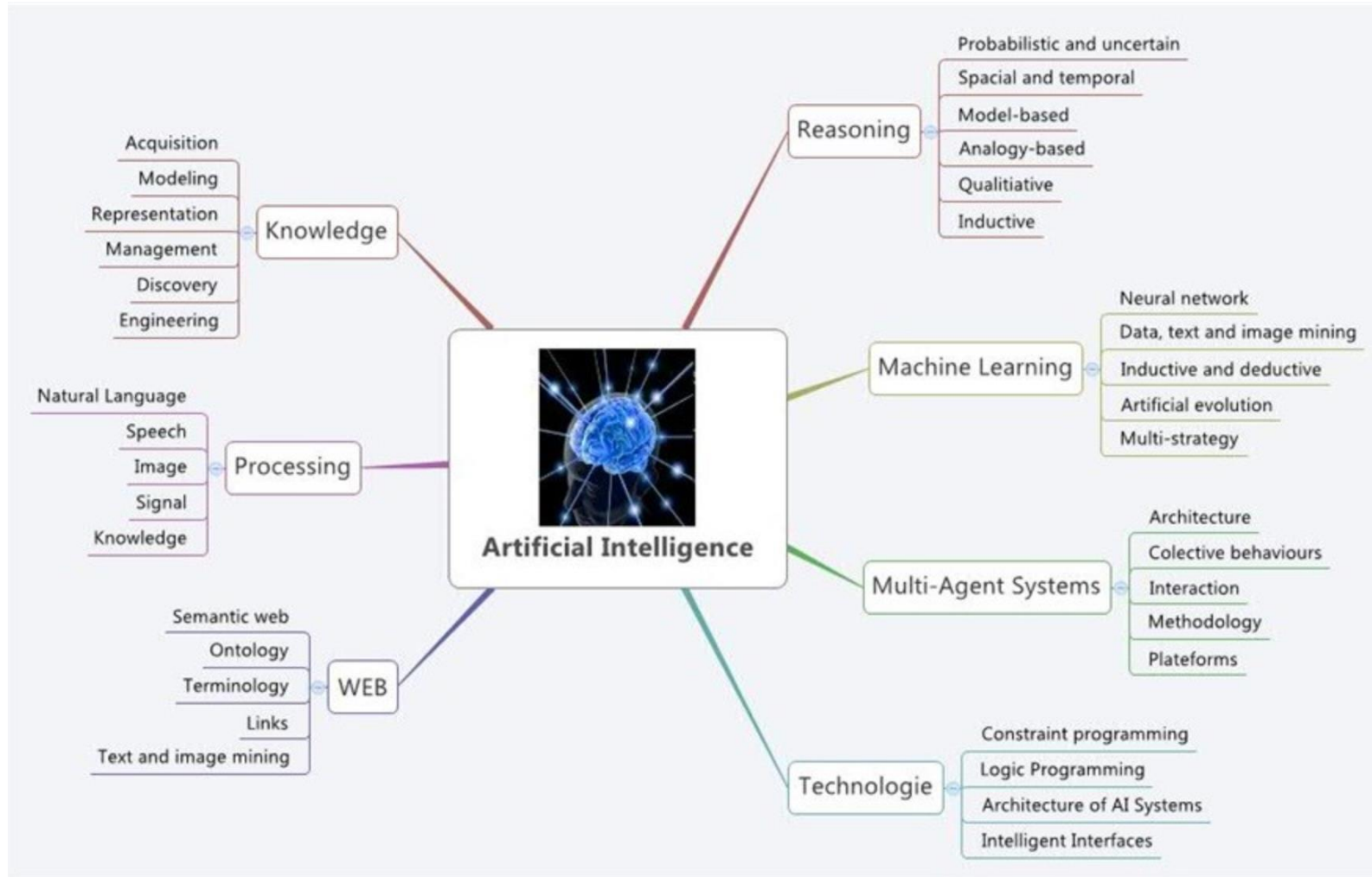
Artificial Intelligence refers to the ability of a Computer-enabled system to process information and produce outcomes in a manner similar to the thought process of humans in learning, reasoning, decision making and solving problems



Artificial Intelligence is the science and engineering of making intelligent machines, especially intelligent computer programs.

John McCarthy (1955)

Brief Artificial Intelligence Topics Taxonomy



AI Techniques Taxonomy for POC applications

We use Artificial Intelligence and Computational Intelligence as synonyms

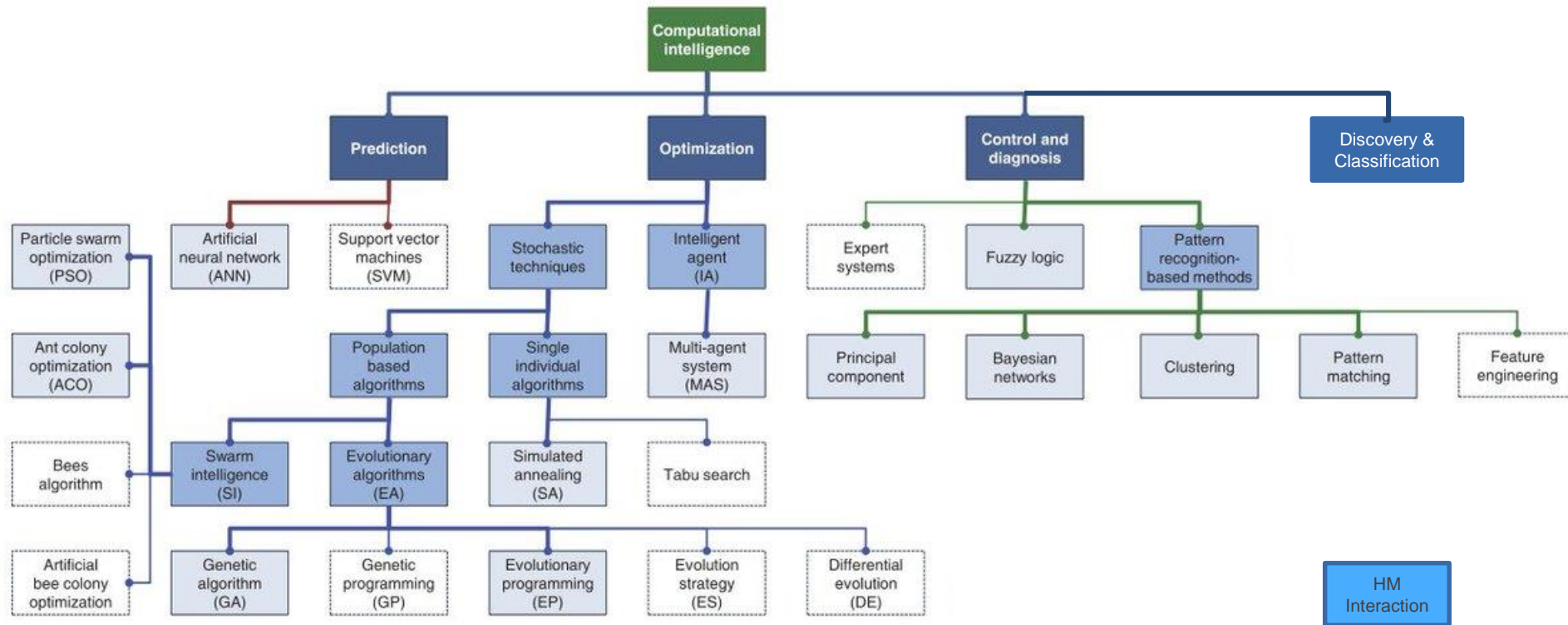


Computational intelligence techniques for HVAC systems: A review. Muhammad Waseem Ahmad (✉), Monjur Mourshed, Baris Yuce, Yacine Rezgui. BRE Centre for Sustainable Engineering, School of Engineering, Cardiff University, Cardiff, CF24 3AA, United Kingdom. BUILD SIMUL (2016) 9: 359–398. DOI 10.1007/s12273-016-0285-4



AI Techniques Taxonomy for POC applications

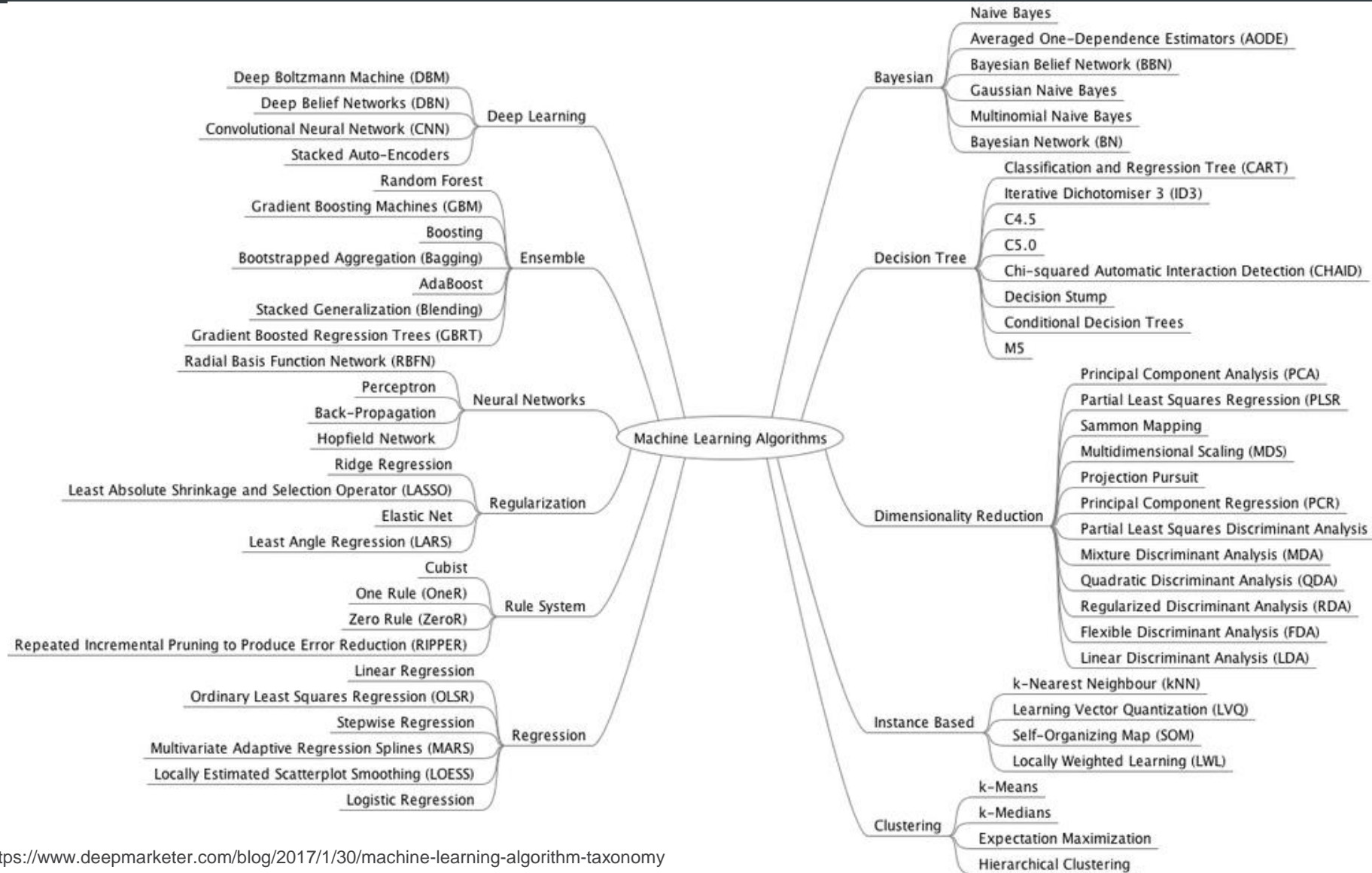
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A Machine Learning Algorithms Taxonomy





Aim of the KMO WG at Central level

- Disseminate the Knowledge Centric Systems Engineering paradigm.
- Promote and evolve the knowledge management process within the SE Standards, Handbook and SEBoK
 - Support standards activities relevant to ontology engineering
 - Contribute to the development of the Information-related portions of the SE handbook and SEBoK.
 - Enable accurate and targeted access to relevant SE knowledge, reducing costly duplications and errors
- Promote ontologies as the means for real knowledge interoperability within the Systems Engineering lifecycle
- Study the implications of Ontologies and Knowledge Management in model-based environments (MBSE), specifically their common and variant aspects.
 - Build and maintain a summary description of the techniques utilizing ontologies in Model Based System Engineering (MBSE)
 - Analyze the common approaches between SE modelling languages (UML/SysML) and Knowledge representation languages (OWL, RDF, SKOS, RSHiP, ORM, DOGMA, FCO-IM, CogNIAM, etc.)
- Promote (and contribute to) the development of SE ontologies
- Formulate guidance for the development of ontology-based approaches within the SE Lifecycle process and activities for all kinds of purposes (MBSE, tool interoperability, traceability Quality and V&V, Reasoning, Decision making...)





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