Intelligent System Project

(Part I - INTRODUCTION)

Miquel Sànchez i Marrè
miquel@cs.upc.edu

http://kemlg.upc.edu/menu1/miquel-sanchez-i-marre

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https://kemlg.upc.edu
PART 1 – INTRODUCTION
Contents (1)

● Introduction
  ■ Description of the aims of the course
  ■ Description of the team works
  ■ Information about the IS project timeline
  ■ Deliverables of the IS project
  ■ Examples of past ISP projects
Contents (2)

● Problem Analysis
  ■ Problem Feature Analysis.
  ■ Information/Data Analysis.
  ■ Viability Analysis.
  ■ Economic Analysis.
  ■ Environmental and Sustainability Analysis.

● Definition of the Intelligent System project issues
  ■ Definition of main goals of the IS project.
  ■ Definition of sub-goals.
  ■ Task Analysis.
Contents (3)

- Development of an Intelligent System Project
  - Data/Information Extraction
  - Data Mining & Knowledge Acquisition Process
  - Knowledge/Ontological Analysis
  - Planning and selection of Intelligent/Statistical/Mathematical Methods/Techniques
  - Construction of Models and implementation of Techniques
  - Module Integration
  - Validation of Models/Techniques. Comparison of Techniques
  - Proposed Solution
Contents (4)

- Intelligent System Project Output
  - PM1: Definition of the System Document
  - PM2: Midterm Document
  - PM3: Final Document & Software Delivery
  - PM4: Public Defense of the Project
Contents (5)

- Intelligent Methods and Models
  - Review of main Intelligent Methods available.

- Software tools
  - Review of main software tools available.
INTRODUCTION
Aims of the course

- Development of an Intelligent System Project
- Design and construction of an Intelligent System to solve a non-trivial problem
- Integration and application of different knowledge acquired in previous Master courses for the solving of complex problems using Artificial Intelligence techniques.
- Writing and communication abilities of your technical and research work and achievements about Intelligent Systems both to a general audience and to a specialized audience
- Consolidation of team working abilities
Description of the Teamwork

- Assign a role to each member
- Select a team leader
- Maintain a Project Library including:
  - Documents
  - Project schedule (Gantt’s chart)
  - Project Time sheet
- Plan periodical teamwork discussions among members of the team
- Put high efforts in the Knowledge Acquisition process
## Intelligent System Project Timeline

<table>
<thead>
<tr>
<th>Activity</th>
<th>Week</th>
</tr>
</thead>
<tbody>
<tr>
<td>Team Formation</td>
<td>W1</td>
</tr>
<tr>
<td>Searching for a non-trivial problem</td>
<td>W2</td>
</tr>
<tr>
<td>Definition of the Project</td>
<td>W3</td>
</tr>
<tr>
<td>Definition of the Project Document (PM1)</td>
<td>W4</td>
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<tr>
<td>- PM1 is due on: October 15(^{th}), 2015</td>
<td></td>
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<tr>
<td>Midterm Document (PM2)</td>
<td>W8</td>
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<tr>
<td>- PM2 is due on: November 12(^{th}), 2015</td>
<td></td>
</tr>
<tr>
<td>Final Document and Software Delivery (PM3)</td>
<td>W15</td>
</tr>
<tr>
<td>- PM3 is due on: January 14(^{th}), 2016</td>
<td></td>
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<tr>
<td>Public Defense of the Project</td>
<td>W16</td>
</tr>
<tr>
<td>- PM4 on January 21(^{st}), 2016</td>
<td></td>
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</tbody>
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Deliverables of the IS Project (1)

- Definition of the Project Document (PM1)
  - Identification of a topic and a concrete problem
  - Relationship to other similar work/s
  - Specification of the goals of the project
  - Outlining of a strategy to achieve the goals
  - Preliminary Environmental & Sustainability Analysis
  - Preliminary Economic Analysis

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Deliverables of the IS Project (2)

- Midterm Document (PM2)
  - Specifications of the Problem to be solved
  - Requirement Analysis of the System
  - Initial Architecture of the System
  - Proposed Solution Design
    - Initial Task Analysis
    - Methods and alternatives for each task
  - Initial Project Scheduling (Gantt diagram)
  - Software Prototype (if available)
    - Code
    - Executable object
Deliverables of the IS Project (3)

- Final Document and Software Delivery (PM3)
  - Executive Summary
  - User’s Manual
    - Description of the System’s purpose
    - Start-up/Shutdown of the system
    - Examples of use
    - Interactions of the system:
      - Input / output
      - List of Error messages
  - Technical/System Manual
    - Architecture of the System
    - Solution Design
      - Task Analysis
      - Methods implementing each task
Deliverables of the IS Project (4)

- Economic Cost Analysis
- Environmental & Sustainability Analysis
- Final Project Scheduling (Gantt diagram)
- The Project Time Sheet
- Final Software
  - Code
  - Executable object
Deliverables of the IS Project (5)

- Public Defense of the project (PM4)
  - Public Presentation Document (presentation slides)
Examples of Past ISP Projects

2013/2014

- Analysing and interpreting tweets related to weather: talking about the past or about the future, making some sentiment/mood analysis
- Detecting talks about topics of interest related to some business in the Linkedin Network (WhoTalk)

2014/2015

- A prediction system for bike and spot availabilities (Bicing predictor)
Analysing and interpreting tweets related to weather: talking about the past or about the future, making some sentiment/mood analysis

Our objective is to create a system capable to analyze tweet data related to weather. By analyzing we really mean that the system should be able to understand some of the information in the tweet.

This information is clustered into three tasks:

• The first main task we want to be able to do is to detect when the information of a tweet happened: is the tweet talking about the past, the present or is it making a prediction?

• The second task is to understand if the tweet is positive, negative or neutral. This task is usually referred as sentiment or mood analysis.

• The third and last task is to infer what kind of weather is a tweet referring to. Is the tweet talking about the rain, wind etc...
Detecting talks about topics of interest related to some business in the Linkedin Network (WhoTalk) (1)

Interview with the client (user)
  Taking requirements
  Definition of scope and risks
Access to customer data (Books / Keywords / LinkedIn profile)

Books analysis
  Preprocessing of the books
  Implement frequency algorithms
  Frequency analysis of keywords (keywords Client)
  Implement the feature extraction algorithm (keywords)
  Extraction of features
  Frequency analysis of the extracted keywords
  Make Collecting of keywords / frequency

Database creation
  Definition of structure
  Create database
  Populate Database

Creation and Analysis of classification algorithms
  Study the proposed classification algorithm (antispam methods)
  Algorithm implementation
  Training the Algorithm
  Testing the Implementation
  Testing the Algorithm
Detecting talks about topics of interest related to some business in the Linkedin Network (WhoTalk) (2)

Creation of Service RESTful (Server / BackEnd)
- Install Server
- Creating restful structures
- Creating the Rest service
- Implementation of the service in server
- Integration with LinkedIn Api
- Implementation of Algorithm for periodic reading the linkedIn comments of user's contacts

Creation of FrontEnd
- Layout of the Front
- Creation of MobileFirst App
- Creation of Restful front structure
- Integration with LinkedIn Api
- Integration with Restful Server (app server)

Management and monitoring
- Prepare documentation
- Track project stages
- Continue Communication with client
A prediction system for bike and spot availabilities (Bicing predictor)