



Faculty of ICT
B.Sc. I.T. (Hons.) in Artificial Intelligence
ICS2000 (Group Assigned Practical Task)

Presentations of ICS2000 project proposals will be delivered by academic members of staff to 2nd year students, on Friday 9th January 2016 in the ICT Auditorium (Room 9, Level -1, Block B, ICT Building) as follows -

Between 09:00am and 09:15am – Prof. Alexiei Dingli

- AIR - Adaptive Internet Radio
- Sentiment Analysis for Maltese - SAM

Between 09:15am and 09:30am – Prof. Matthew Montebello / Dr Vanessa Camilleri

- Smart Systems Learning Pathways
- P2 - Playing with Prolog

Between 09:30am and 09:40am – Dr Joel Azzopardi / Dr George Azzopardi

- Search Result Clustering

Between 09:40am and 10:00am – Questions and Answering



Faculty of ICT
B.Sc. I.T. (Hons.) in Artificial Intelligence
ICS2000 (Group Assigned Practical Task)
Proposal Form

Title:	AIR – Adaptive Internet Radio
Project Supervisor:	Prof. Alexiei Dingli
Project Co-supervisor: (if applicable)	
Main Subject Area:	The students will explore the topic of Adaptation within the context of Internet Radios by making use of information obtained from social media.
Detailed Description of Task (c. 100 words):	<p>AIR is an online radio station, which is adaptive to the listener. In this case, we will base our radio station within the context of a shop where various listeners might be visiting the shop. The task of the group involves:</p> <ul style="list-style-type: none"> • Create a Facebook login where the user can also specify the page related to the shop. • The system should go through the associated page and create a profile of people using that page (in order to predict the kind of music preferred by the customers) • The online radio will then create a playlist for the following day (based upon the predictions obtained from the customers). It is very important that the generated playlist is not repetitive and the system should avoid boring sequences. It should also take into account different times of day (Exciting in the morning and calmer in the afternoon). • The system can be controlled via a web interface. • It will also allow different people to bid for air space in order to place their adverts in that particular shop. The shop owner must obviously approve them before airing. • In order to guarantee a quality transmission, the radio is not streamed but a 12-hour cache is downloaded from the server when the shop is closed. In so doing, bandwidth is not wasted when the shop is open and the quality of the transmission is guaranteed. This means that a simple client server needs to be implemented.
Min/Max group size:	4

<i>Deliverables (e.g. group or individual GAPT report; software; presentation; etc.):</i>	<p>The artifact</p> <p>A 5 minute (max) video explaining the app</p> <p>A group report of around 12 pages</p>
<i>Resources Available:</i>	Access to a read Radio can be provided.
<i>Recommended Reading (at least one title):</i>	<ul style="list-style-type: none"> • http://www.pcworld.com/article/190705/start_your_own_internet_radio_station_for_free.html • Grant, M., Ekanayake, A., & Turnbull, D. (2013). MeUse: Recommending Internet Radio Stations. In ISMIR (pp. 281-286). • Aizenberg, Natalie, Yehuda Koren, and Oren Somekh. "Build your own music recommender by modeling internet radio streams." Proceedings of the 21st international conference on World Wide Web. ACM, 2012.
<i>Prerequisite Knowledge Required:</i>	Programing, Foundations of AI
<i>Method of Assessment (individual marks or group marks or a specified mixture):</i>	Group marking
<i>Indication of any Ethical Issues and How these will be Tackled (if applicable):</i>	No since we will only use publicly available information

Adaptive Internet Radio



- “ Loud music causes customers to move through a supermarket more quickly, without reducing sales volume
- “ Slow music causes people to take their time but buy more.
- “ Classical music increases sales and leads customers to buy more expensive merchandise.
- “ However, classical music makes people think of a store as expensive.
- “ French music at a wine store makes people buy French wines. German music makes them buy German wines.
- “ People perceive a shorter wait time when they hear music that they like

Adaptive Internet Radio

1. Shop owner logs into Facebook and the system predicts which songs, people associated to the Shop page like
2. Create a playlist and a web interface to manage the playlist by shop owner
3. A web interface to bid for adverts and augment the playlist
4. Client-server to handle the uploading and playing of songs



Project Parameters

“Max Group Size: 4

“Deliverables:

“The artifact

“A 5 minute (max) video explaining the app

“A group report of around 12 pages

alexiei.dingli@um.edu.mt



Faculty of ICT
B.Sc. I.T. (Hons.) in Artificial Intelligence
ICS2000 (Group Assigned Practical Task)
Proposal Form

Title:	Sentiment Analysis for Maltese - SAM
Project Supervisor:	Prof. Alexiei Dingli
Project Co-supervisor: (if applicable)	
Main Subject Area:	NLP, Machine Learning
Detailed Description of Task (c. 100 words):	<p>Sentiment Analysis refers to the use of natural language processing, text analysis and computational linguistics to determine the attitude of a speaker or a writer with respect to some topic or the overall contextual polarity of a document. The attitude may be his or her judgment or evaluation, affective state (that is to say, the emotional state of the author when writing), or the intended emotional communication (that is to say, the emotional effect the author wishes to have on the reader).</p> <p>Deep Sentiment Analysis performs the same task but using Deep Learning techniques, a new breed of machine learning algorithms capable of obtaining better results than traditional algorithms. However, when it comes to Sentiment Analysis, these algorithms are still in embryonic stage. TensorFlow is a new powerful library created by Google for doing large-scale numerical computation. One of the tasks, which it excels, is implementing and training deep neural networks. The idea is to research these techniques and use them to obtain better results.</p> <p>For this project, you are requested to:</p> <ol style="list-style-type: none"> 1. Clean the data which I will be providing (Essentially make sure the sentences in Maltese are properly categorized) and augment it with additional data. 2. Make use of the Tensorflow API to create a classifier capable of performing Sentiment Analysis on Maltese. <p>Note: The thesis "Sentiment Analysis in Maltese" (2015) will guide you towards achieving this goal.</p>

<i>Min/Max group size:</i>	4
<i>Deliverables (e.g. group or individual GAPT report; software; presentation; etc.):</i>	<p>The artifact</p> <p>A 5 minute (max) video explaining the app</p> <p>A group report of around 12 pages</p>
<i>Resources Available:</i>	<p>TensorFlow</p> <p>A corpus of text from which to learn</p>
<i>Recommended Reading (at least one title):</i>	<ul style="list-style-type: none"> • http://tensorflow.org/tutorials • http://tensorflow.org/get_started/os_setup.md • Sant Nicole - Sentiment Analysis in Maltese, 2015
<i>Prerequisite Knowledge Required:</i>	Programing, Foundations of AI, NLP, Machine Learning
<i>Method of Assessment (individual marks or group marks or a specified mixture):</i>	Group marking
<i>Indication of any Ethical Issues and How these will be Tackled (if applicable):</i>	N/A

Sentiment Analysis for Maltese (SAM)



Sentiment Analysis for Maltese (SAM)

The Process

1. We will provide you with the data
2. Clean the data provided and add new ones
3. Follow the process used in the thesis
4. Implement it with TensorFlow
5. Analyse and compare the results

Project Parameters

“Max Group Size: 4

“Deliverables:

“The artifact

“A 5 minute (max) video explaining the app

“A group report of around 12 pages

alexiei.dingli@um.edu.mt

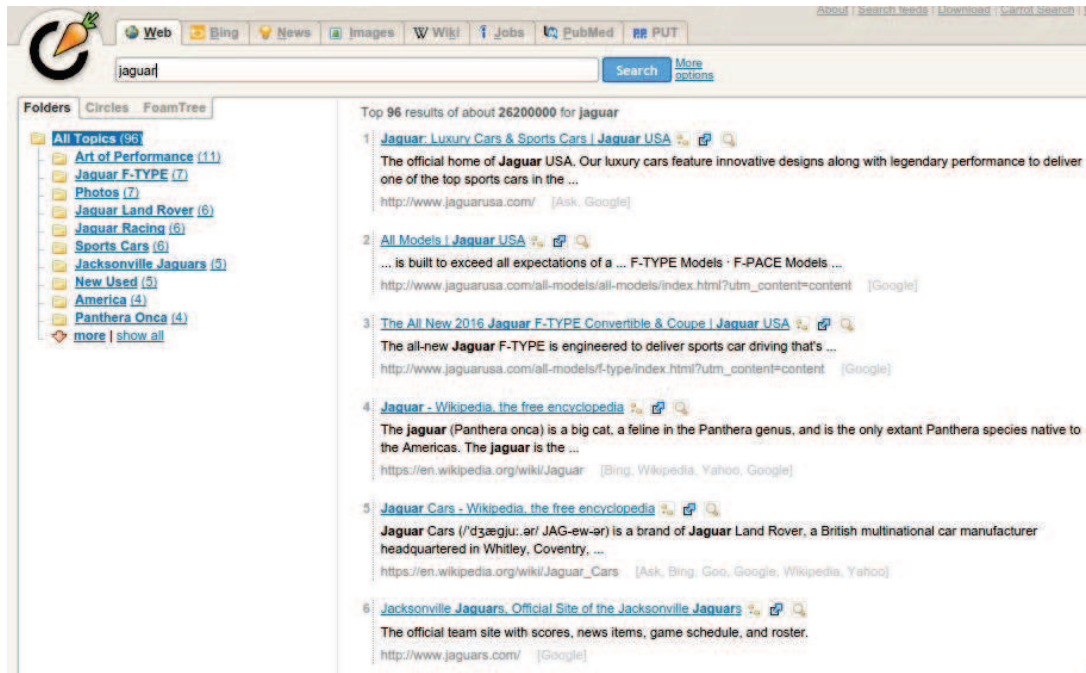


Faculty of ICT
B.Sc. I.T. (Hons.) in Artificial Intelligence
ICS2000 (Group Assigned Practical Task)
Proposal Form

Title:	Search Result Clustering
Project Supervisor:	Dr Joel Azzopardi
Project Co-supervisor: (if applicable)	Dr George Azzopardi
Main Subject Area:	Indicating how it is relevant to the AI degree
Detailed Description of Task (c. 100 words):	The aim of this task is to investigate the use of different clustering algorithms to cluster search results into different clusters according to the different query words' senses. The papers cited below describe the No-K-means algorithms that have beaten the state of the art. In this project, you will be using other algorithms including ones that are typically used in text clustering (e.g. K-Means) as well as others that are typically utilised in the clustering of objects others than text, such as Gaussian Mixture Models (GMMs) and Self-Organizing Maps (SOMs). The possible use of Latent Semantic Analysis (LSA) will also be considered to explore whether it can enhance the clustering process.
Min/Max group size:	3
Deliverables (e.g. group or individual GAPT report; software; presentation; etc.):	Software Artefact + Report + Presentation
Resources Available:	Gold Standard Dataset (SemEval-2013 Task 11)
Recommended Reading (at least one title):	<p>J. Azzopardi and C. Staff, "Incremental clustering of news reports," Algorithms, vol. 5, no. 3, pp. 364–378, 2012. [Online]. Available: http://www.mdpi.com/1999-4893/5/3/364</p> <p>R. Navigli and D. Vannella, "SemEval-2013 task 11: Word sense induction and disambiguation within an end-user application," in Second Joint Conference on Lexical and Computational Semantics (*SEM), Volume 2: Proceedings of the Seventh International Workshop on Semantic Evaluation (SemEval 2013). Atlanta, Georgia, USA: Association for Computational Linguistics, June 2013, pp. 193–201. [Online]. Available:</p>

	http://www.aclweb.org/anthology/S13-2035 Chris Staff, Joel Azzopardi, Colin Layfield, and Daniel Mercieca. Search results clustering without external resources. In Marcus Spies, Roland R. Wagner, and A Min Tjoa, editors, Proceedings of the 26th International Workshop on Database and Expert Systems Applications DEXA 2015, Valencia, Spain, September 1-4, 2015, pages 276–280, 2015.
<i>Prerequisite Knowledge Required:</i>	Clustering and Classification Methods as covered in ICS2205 (Web Intelligence)
<i>Method of Assessment (individual marks or group marks or a specified mixture):</i>	
<i>Indication of any Ethical Issues and How these will be Tackled (if applicable):</i>	N/A

Search Result Clustering in Carrot



<http://search.carrot2.org/>

Why Search Result Clustering?

- A term may have different senses:
 - e.g. '*jaguar*' may refer to
 - The car
 - The cat
 - Some software
 - ...
- Clustering may help in discovering these different senses.

Search Result Snippets

- Ideally, clustering is performed only on the basis of these snippets only without downloading the entire web documents.
- Snippets are typically quite small (c. 20 words long).
- Clustering may be performed by the search engine itself, or by post-processing the results list.

Task Specification

- Development of a system that given a search-result list, clusters the results into different senses.
- Implementation of different algorithms, such as:
 - K-Means
 - Gaussian Mixture Models (GMMs)
 - Self-Organising Maps (SOMs)
 - No-K-Means
- Possible use of dimensionality reduction techniques such as Latent Semantic Analysis (LSA)

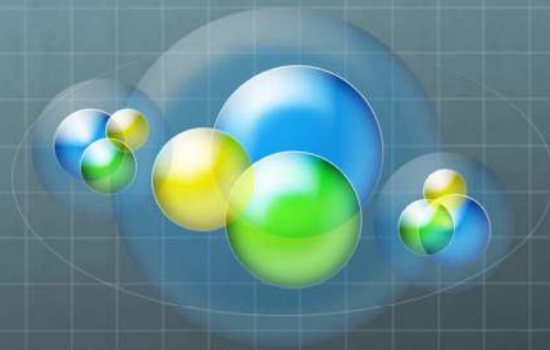
Evaluation

- Use of Gold Standard datasets.
- Analysis of different Cluster Validity Indices (such as Generalised Dunn's Index) to discover (quasi) optimal configurations.



Faculty of ICT
B.Sc. I.T. (Hons.) in Artificial Intelligence
ICS2000 (Group Assigned Practical Task)
Proposal Form

Title:	P ² – Playing with Prolog
Project Supervisor:	Prof. Matthew Montebello
Project Co-supervisor: (if applicable)	
Main Subject Area:	Logic Programming
Detailed Description of Task (c. 100 words):	A colourful game is to be created for young children which will embrace Prolog principles without the explicit reference to Prolog itself. Students need to convert any one of the Prolog concepts and convert into an enjoyable and educational game.
Min/Max group size:	Minimum 2 – Maximum 4
Deliverables (e.g. group or individual GAPT report; software; presentation; etc.):	60% Working prototype of a colourful game using graphics and animation. 30% Short video / demo. 10% Administrator documentation.
Resources Available:	Open source 3 rd party software only.
Recommended Reading (at least one title):	http://www.learninggamesforkids.com/ http://encyclopedia.kids.net.au/page/pr/Prolog
Prerequisite Knowledge Required:	Basic game development. Knowledge of Prolog.
Method of Assessment (individual marks or group marks or a specified mixture):	Individual marks based on distribution of work and quality of deliverable.
Indication of any Ethical Issues and How these will be Tackled (if applicable):	n/a



This is not an APT about games ...

Playing with Prolog

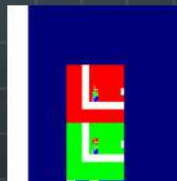
Main objective is to introduce & teach

Prolog to young children through play ...

Prof. Matthew Montebello

Gamify 1 basic Prolog concept

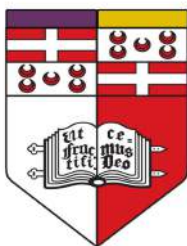
- Binding
- Pattern matching
- Rules – Forward/Backward chaining
- Backtracking
- Recursion
- Lists



Targets

- 🌐 Audience: 10-12 year olds
- 🌐 Platform: Any
- 🌐 Hardware: Any
- 🌐 Software: Any
- 🌐 APIs: Any





Faculty of ICT

B.Sc. I.T. (Hons.) in Artificial Intelligence

ICS2000 (Group Assigned Practical Task)

Proposal Form

Title:	Smart Systems Learning Pathways
Project Supervisor:	Dr Vanessa Camilleri
Project Co-supervisor: (if applicable)	Prof. Matthew Montebello
Main Subject Area:	Development of a smart online learning system
Detailed Description of Task (c. 100 words):	<p>In society there is an increasing number of adults struggling with language literacy. This could be due to a number of factors including migration, ineffective schooling, and situations that led to early school leaving. It is being proposed to design and develop an online learning platform that would help adults trace different learning pathways to accommodate their language literacy needs. This platform would need to have the following :</p> <p>User registration and profile</p> <ul style="list-style-type: none"> • Easy to use navigation • Inclusion of multiple modalities for learning (such as videos, audio, text and graphics) • Inclusion of interactive exercises that would be added to user profile • Addition of levels of abilities • The platform should allow for customization and addition of content, levels and interactive exercises.
Min/Max group size:	3-4 students
Deliverables (e.g. group or individual GAPT report; software; presentation; etc.):	Customizable learning Platform and Presentation

<i>Resources Available:</i>	<p>Please refer to these sites for further reference :</p> <p>http://www.iwdl.de/cms/lernen/start.html</p> <p>www.writeon.ie</p>
<i>Recommended Reading (at least one title):</i>	<p>Peña-Ayala, A., Sossa, H., & Méndez, I. (2014). Activity theory as a framework for building adaptive e-learning systems: A case to provide empirical evidence. Computers in Human Behavior, 30, 131-145.</p>
<i>Prerequisite Knowledge Required:</i>	<p>N/A</p>
<i>Method of Assessment (individual marks or group marks or a specified mixture):</i>	<p>Group Assessment</p>
<i>Indication of any Ethical Issues and How these will be Tackled (if applicable):</i>	<p>No ethical issues involved.</p>



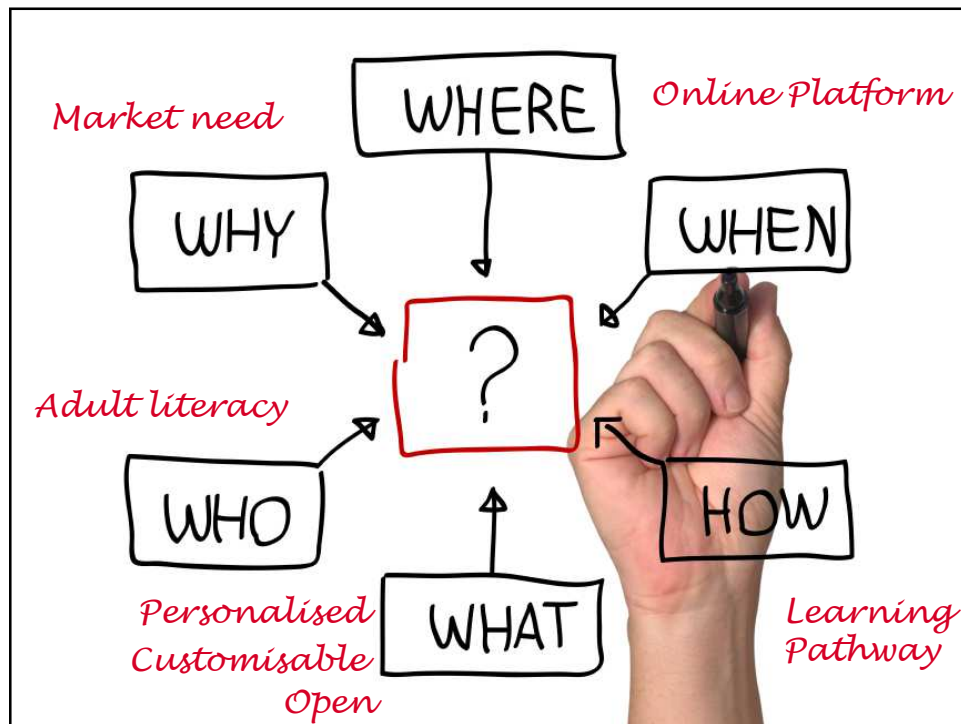
Vanessa Camilleri
University of Malta

Smart Systems Learning Pathways - *re-inventing adult literacy*



GAPT Project Description

In our society there is an increasing number of adults struggling with language literacy. This could be due to a number of factors including migration, ineffective schooling, and situations that led to early school leaving. It is being proposed to design and develop an online learning platform that would help adults trace different learning pathways to accommodate their language literacy needs.



Platform Targets

- User registration and profile
- Easy to use navigation
- Inclusion of multiple modalities for learning (such as videos, audio, text and graphics)
- Inclusion of interactive exercises that would be added to user profile
- Addition of levels of abilities
- The platform should allow for customization and addition of content, levels and interactive exercises.



<http://www.iwdl.de/cms/lernen/start.html>

