**Senior Capstone Project Proposal**

Code Name: GRAM

Megan Charity - Deep Run High School – IT Project Management

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12. **Summary**

This document entails the overview, scope, risks, goals, deliverables, and structure of the artificial intelligence program GRAM. GRAM is a conversational chatterbot that will emulate a user’s personality and use common speech patterns, opinions, word choice, and responses of the user to incorporate it as their own “profile” in order to communicate with another user.

1. **Project Overview**

The project – Codename: GRAM – is a chatterbot conversational artificial intelligence program that learns from a single user’s speech pattern and conversational techniques to emulate the person in regular human conversation. GRAM will be preprogrammed with basic conversation topics and responses, then inquire questions from the user to develop an analysis and library of their saved responses. The program will learn from these conversations and develop a “profile” of the user, while learning more complex responses and phrases based on the user. Research topics will include previous AI chatterbot programs such as Eliza and Cleverbot, as well as the implications of artificially intelligent machines such as in IBM’s Watson program.

1. **Project Scope**

GRAM will be a web application using cloud technologies to store the individual user profiles. Trading and sharing user profiles will also be a feature and the program will include a sprite interface of the profiled user to make conversation more comfortable and interacting.

1. **Goals / Objectives**

|  |  |
| --- | --- |
| **Goal** | **Objective** |
| * Create a chatterbot program that holds a “profile” of a user’s personality through phrases and responses | * Hold a conversation for at least 5 turns of interaction * Emulate an individual user’s speech patterns (i.e. slang terms or common phrases and responses used by the user) * Ask questions to the user and store responses for later * Show animations through the sprite interface concerning the response or question posed (emulate emotion) * Participate in the Turing Test |

1. **Project Assumptions**

* I will assume that the cloud services will work
* I will assume that the data will not be lost
* I will assume that the user inputs a reasonable question / response
* I will assume that the code will be constantly updating the information it has stored

1. **Project Risks**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **#** | **Risk Area** | **Likelihood** | **Impact on project** | **Contingency Plan** |
| 1 | All of the saved profile data is lost | Medium | The profile will have to be recreated and will most likely not be exactly the same as it was before, since the profile was based on personality | Back-up copies of the entire program and the profile along with restoration of a base-line default program |
| 2 | No topic list for the given topic | High | GRAM will be unable to respond correctly or realistically to questions that it is posed | Make multiple default responses and create new topic list |
| 3 | Exponentially grows too big in memory | High | Slower processing speed, lots of RAM needed for the program to run | Make a limit on how much the program can retain for a profile’s dictionary and how many programs are allowed. Make the program in the cloud |
| 4 | Program crashes from an unexpected question or response | Medium | Unable to continue conversation or break data topic files | Make default responses and prohibit certain characters for code injection |
| 5 | Programming language limitation of importing, exporting, or understanding data | Medium | Unable to complete certain text processing tasks and comprehend the text | Find a work-around algorithm |
| 6 | Cross-personality traits accidently being stored | Low | Mixed up data profiles | Identification required before participating in conversation |

1. **Project Constraints**

* Lack of data storage on browser, computer, or cloud
* Creating and applying new algorithms to process the text
* Developing topic dictionary banks
* Drawing animations
* Debugging, sorting, and deleting misplaced data

1. **OPA**

|  |  |  |
| --- | --- | --- |
| Organization | Impact on Project | Impact on them |
| GitHub | Low | Medium |
| AI Research Labs | Low | High |
| Companion Agents Researchers | Low | High |
| Elderly | Low | High |
| Socially disabled people | Low | High |
| Storyboard | Low | Medium |

1. **Major Milestones / Deliverables**

|  |  |  |
| --- | --- | --- |
| **Milestone** | **Deliverable** | **Estimated Date** |
| 1. Final Project Proposal and Rubric | * Project Proposal * Project Rubric | 11/16/2015 |
| 1. Research Complete | * All 30 sources found and analyzed | 12/18/15 |
| 1. Project Research Paper | * Research paper | 01/11/16 |
| 1. Alpha –   Working Algorithm | * Draft of final software product * Text-based beta conversation program * 3 topic dictionaries * Proof of text analysis * Default responses * Proof of saved conversation data | 02/01/16 |
| 1. Beta –   GUI Interface Program | * Software with sprite and 5 emotional animations * 10 topic dictionaries | 03/01/16 |
| 1. Progress Report | * Presentation of program’s status update and possible demo | 03/15/16 |
| 1. Release –   1 User Profile | * Personality imitation of myself (use of my catchphrases or favorite words) * 15 topic dictionaries * Sprite with 10 animations | 04/01/16 |
| 1. Preliminary Project Portfolio | * Project portfolio rough draft | 04/08/16 |
| 1. Final –   Successful Interaction with another Human Being | * Turing Test results | 04/15/16 |
| 1. Final Portfolio and proof of completed project | * Final portfolio * Proof of completed program | 04/22/15 |
| 1. Presentation of project | * Panel presentation * Poster * Demo | 05/02/16 |

1. **Product Structure Approach**

The program will be created through development of algorithms and GUI interfaces. Combined with text analysis, databases, and HTML-based user interface, the program will start with an alpha text-only conversation program, progress to a GUI-based text input program with developing “profiles”, and finally an interface with sprite animations and one developed user profile (my personality). The builds for the program will store the amount of data saved to the library and the current algorithm in use.

Once an algorithm is proved to work successfully in the program, the next phase of development will proceed. Due to time constraints, revisions to algorithms will only be limited to debugging and the project will not focus on making the algorithms more efficient. The first algorithm tested that is successful will permanently be used in the project, no exceptions. After the program can interpret and save conversations and phrases, a profile will be developed specifically for the person using the program. This will require multiple instances of conversation between the user and the program to make the most accurate and efficient AI profile based on the user. After sufficient amount of data has been saved on the user, a Turing test will be conducted on GRAM and another user who has not interacted with GRAM before.

1. **Approvals**

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**Lynne M. Norris - Advisor / Date Bridget McInnes – Mentor / Date**

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**Megan Charity – Researcher / Date**