Salvatore Canale  
Mengyi Chen  
Adonis Davis  
Joshua Diehr

Bonita Griffin

Thomas Hwang  
  
Prof. Azar  
22 May 2019

Mental Health Classification System

**Project Overview:**

The intent of this project is to make a tool to assist mental health professionals with psychiatric diagnosis. The current most accepted method of diagnosing mental health disorders is interviewing patients and associate symptoms with disorders described in the DSM manual(which is the Diagnostic and Statistical Manual of Mental Disorders). The interview process is commonly referred to as the “Initial Psychiatric Assessment”. The most commonly accepted method of performing the initial psychiatric assessment is with SCID interview guide built from the DSM. The SCID is the Structured Clinical Interview for DSM-5 Disorders (SCID). Both tools used together allow the psychiatrist or therapist to take the symptoms from the patient and make an educated diagnosis of the most closely described disorder. Currently, this is all done manually by the mental health professional. The intent of the new tool is to automate the diagnosis process and build upon a collective set of real-life diagnoses to create a better tool for diagnosing.

Tool Features:

* Take DSM symptom keywords and associated words and enter into database
* Have database for anonymous (ID only mapped) entry of each patient’s 2 paragraph interview write-up
  + Allow for fields that can be updated later, in case that diagnosis is updated or changed
* UI view for patient to enter 2 paragraph description of their problems
* UI view for psychiatrist to see/interact with:
  + patient write-up
  + most likely disorder with grade/rating
  + follow-up questions to ask with place to enter follow-up answers
  + Ability to select disorder they are diagnosing patient with
* System/algorithm that takes 2 paragraph description and mines symptom keywords, then associates frequency of keywords with DSM symptom keywords in database to give disorder rating
* System that also recalculates disorder rating based on follow-up question answers
* After final diagnosis is made by psychiatrist:
  + system reevaluates unknown keywords entered by patient and updates database of keyword symptoms for that disorder
  + patient data is anonymously stored in another database, to give psychiatrist data of past patient diagnoses

**Work to be completed:**

* Background research of current diagnostic method (Requirements gathering) - Everyone
* Text Mining and Keyword Extraction - Mengyi/Thomas
* Database Creation and Management - Joshua
* System/Algorithm to Identify and Grade Illnesses - Adonis/Sal
* User Interface/Graphical User Interface Creation - Sal/Joshua

**Detailed work descriptions:**

Background research of currently accepted form of “Initial Psychiatric Assessment”:

Current most accepted method is using Structured Clinical Interview for DSM-5 Disorders (SCID). The SCID is an interview guide based on the symptoms described for each disorder in the Diagnostic and Statistical Manual of Mental Disorders (DSM). I think we need to find real diagnoses from real patients and see if we can run them through the traditional SCID to see how they are diagnosed and compare to our solution’s diagnosis. Our solution needs to be as good or better than current accepted methods. This needs to be quantifiable through percentage of misdiagnosed cases.

Text Mining and Keyword Extraction:

Create a system to read patient problem descriptions along with illness classifications. This system will need to extract keywords and weigh them based on occurence (number of times appearing) and descriptions (i.e. Excessive, Persistent, Extreme). Keywords and important values should be formatted to be stored in the database and used in the system.

Database Creation and Management:

The DBA will need to create tables to handle the data provided by the DSM, Patients, and generated from the system. Tables will be needed for DSM data, Patient Data, Keyword/Descriptor Data, and possibly past results or generated ratings. The database must be maintained to handle changes in the system and changes in data formats. Data access should be monitored to maintain accuracy.

System/Algorithm to Identify and Grade Illnesses:

Create a system to use gathered keyword information and create ratings based on known illnesses. The system should generate ratings based on relevance to illnesses and provided most likely cases. Questions should be asked based on likely illnesses. Results from these questions should provide scores to reevaluate ratings and reshuffle ranks. This process should be repeated multiple times to get accurate results.

User Interface/Graphical User Interface Creation:

Create the patient and doctor side GUI. Prompt the patient for a problem description to submit. Process the input to check for valid input and prompt for corrections. Gather additional patient information to provide to the database. Display system results and create an appealing questionnaire system to further system results. Finally display gathered information and diagnosis results. For the doctors side allow them to search and view patient info and results.