**Paper Review**

**Paper Summary**

The authors of the paper proposed an expert system for diagnosing depression. This approach was implemented using SL5 Object Language and it is based on a forward chaining reasoning method that can make inferences about facts of the world using rules and objects and it is capable of producing appropriate results.

**Summary of Strenghts**

The paper presents an interesting approach to diagnosing depression in patients using expert knowledge that has been converted into SL5 Object Language-based syntax (Facts, Rules, Objects). This kind of method has not been implemented before, so it represents a novel perspective. The authors have also made this tool available for free, offering the complete source code at the end of the paper.

The proposed system was specifically developed to aid doctors/patients in diagnosing this disorder, so it has a user-friendly interface, doesn't require intensive training to be used, and takes symptoms as input using YES or NO questions. At the end of the dialogue session, the tool is capable of providing an assessment and recommendation to the user based on the result of the „consultation”. The algorithm was developed with the help of the Psychology department and was also evaluated by psychology students, who were satisfied with its performance, efficiency, front-end design, and accessibility.

Another great point is that it covers 9 rules / symptomms, instead of just one: a loss of energy, a change in appetite, sleeping more or less, anxiety, reduced concentration, indecisiveness, restlessness, feelings of worthlessness, guilt or hopelessness, and thoughts of self-harm or suicide.

**Summary of Weaknesses**

The first thing that jumps out is that the paper is full of errors, ranging from grammatical, lexical, spelling or punctuation ones etc... and it makes the reading process very difficult and hard to understand its contents. Some examples include: „forward *chinning*” instead of „*chainning*”, „Diagnosis is *a* very complex because it has many symptoms *and may affect on human health*” instead of „Diagnosis is very complex because it has many symptoms and may affect human health.”, „Expert System is a computer application of Artificial Intelligence (AI) which contains a knowledge base and an inference engine the main components and details are represented in figure 2.” instead of „... an inference engine. The main...” etc... Furthermore, the paper contains 2 chapters with the same title „*Literature Review*”.

In relation to the previous point, the authors opted to examine papers concerning different affections of the human body, none of which relate to mental illnesses or depression. Additionally, the paper does not mention or review other techniques for diagnosing depression, such as web-based fuzzy expert systems or case-based reasoning methods, and there is no comparison between their efficiency and the proposed expert system.

The proposed method focuses only on 9 symptoms and relies on direct YES or NO questions (e.g. "Does the patient have thoughts of self-harm or suicide?"), which may not capture the full complexity of depression. Moreover, patients with depression often conceal their emotions and may not respond truthfully, rendering this approach simplistic from a psychological perspective. The authors, who are faculty members of engineering and IT, seem to have adopted a mathematical perspective, reducing the disorder to a set of IF-ELSE statements. However, real-life cases are much more intricate. The code appears to suggest that the patient has depression only if he/she has all the 9 symptoms, but this is not entirely accurate. Using the OR operator instead of AND would have been more appropriate. Additionally, although the expert system was rated favourably by psychology students, there is a lack of tests performed on patients so we cannot be sure of its accuracy.

Furthermore, I believe that the paper would benefit from including basic information about expert systems and SL5 Object Language in the introduction, for a more comprehensive reading experience. It would have been helpful to include a link to a Github repository as well.

Link to the paper: [An Expert System for Depression Diagnosis](http://dstore.alazhar.edu.ps/xmlui/bitstream/handle/123456789/128/IJAHMR190404.pdf?sequence=3&isAllowed=y)