IDENTIFICATION AND CLASSIFICATION OF PCOD AND PCOS USING MACHINE LEARNING TECHNIQUES

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Introduction:

There are many disorders related to women reproductive system which may lead to some serious health issues in future. These disorders are related to the ovaries, uterus, cervix, the vagina, etc. the cause behind occurring of these diseases is hormonal changes inside the body, hormonal imbalance, irregular living patterns, stress, etc. Polycystic ovary syndrome (PCOS) and PCOD comes in the category of hyperandrogenism i.e. excess androgen production by ovaries. It is a disorder commonly found in reproductive age group(15-40 yrs). The age group is fixed as before 15 age is when the menstruation begins; so there is a huge possibility that the menstrual periods are irregular and after 40 age the menopause periods of women begins. In this condition the women's hormone levels are affected. This hormonal imbalance leads to cysts formation on the outer edge of the ovaries. The cysts are like follicle or small ball of tissues which is found in both or either ovary of PCOS women. Commonly found symptoms of PCOS are: Irregularity or missed menstrual periods, Excessive Hair growth on face and unwanted body parts known as Hirsutism, Acne formation and oilier skin due to high androgen levels, abnormal Body Mass Index leading to obesity. Along with the mentioned physical symptoms; there is a need to conduct a blood test for checking the hormone levels in body.

The symptoms associated with PCOD often leave a lasting impact on women's physical and mental well-being. It is estimated that about 34% of the women suffering from PCOD problem also suffer from depression, and nearly 45% suffer from anxiety. This makes it essential to diagnose and manage the symptoms early to prevent PCOD problems in future. Many of the women diagnosed with PCOD problem also experience poor quality of life-related to mood swings, negative social relationships, low self-confidence, negative self-image, disruption of eating and sleep patterns, low motivation.

Objectives:

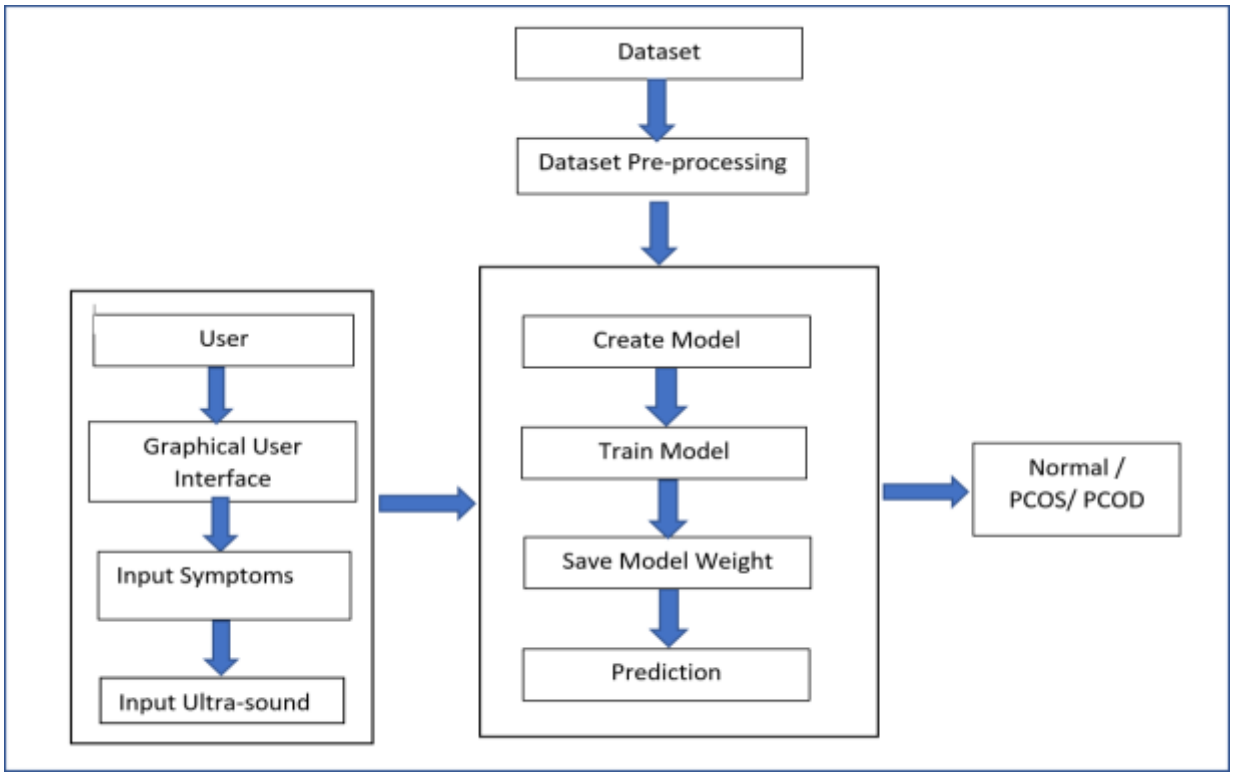
The main objectives of proposed system are:

- To develop a machine learning model that process patient's symptoms to determine the possibilities of PCOS and PCOD.
- To develop a deep learning model using CNN to confirm the possibilities of PCOS and PCOD by extracting the features of ultra-sound ovary images.
- To make the diagnostic process faster and more efficient, reducing the need for multiple tests.
- It aims to enhance the quality of life for women affected by these conditions, supporting better health outcomes and more effective management of PCOD and PCOS.
- To gain a deeper understanding of the underlying causes and variations of PCOD and PCOS.
- To reduce healthcare costs by minimizing the need for extensive testing.
- To provide valuable insights for public health initiatives and awareness programs targeting PCOD and PCOS.

Methodology:

Fig shows the architecture of the proposed system. System contains Four main modules called Pre-processing, Model creation, System Training and Classification. Pre-processing module is used to pre-process the dataset images by resizing them to required dimension. Model Creation module is used to construct a machine language model using desired number of layers. System training phase is used to train the

system with dataset images and store the model weight. Classification module is used to classify the input test image to determine the image class.



Result and Conclusion:

The expected outcome of proposed system are,

- System should pre-process individual dataset images to clean the ultra sound Ovary image dataset.
- System should develop a deep learning model using Keras framework to classify dataset images.
- System should develop a machine learning model to classify whether patient has disease or not based on symptoms.
- System should have a graphical user interface to help end user to use the system easily.
- System should classify input ultra sound ovary images either as Normal or PCOS or PCOD.