**Graduation Project - English Abstract**

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| **Project Code:** | **MPR402 ممش 402 /** |
| **Project Title (in English):** | Oncology Center Services and Prediction Techniques to Assist in Making Right Decision. |
| **Project Title (in Arabic):** | خدمات مركز الأورام وتقنيات التنبؤ للمساعدة في اتخاذ القرار الصحيح |
| **Program Name:** | Medical informatics |
| **Supervisor(s):** | Prof. Dr.Elsayed Badr |
| **Project Team:** | 1-Alaa Walied Mohamed Alshitany2-Eman Tarek Taha3-Basma Talaat Mahmoud4-Abdelrahman Ahmed Abdelhady5-Yara Ahmed Mohamed |

**Project Abstract**

Cancer is any disease among many diseases characterized by the development of abnormal cells that divide uncontrollably and is the leading cause of death for 10 million people, or approximately one death in every 6 deaths. Accurate prediction of response to cancer drugs is difficult due to uncertainty of drug efficacy and heterogeneity of cancer patients. Due to It is one of the most dangerous diseases that affect humans, so highlighting tumor’s centers and paying attention to solving existing problems is important and necessary, and this is what we try to do in our project. We try to organize the process of making appointments and help doctors to choose the right drug efficiently using the deep learning model.

We have integrated 2 public databases in our study: GDSC and CCLE In our study, we operate on 256 genes and 238 drugs. GDSC database provides us IC50 values for large-scale drug screening data, when IC50 value is small, it is evidence that the effectiveness of the drug is high. CCLE database provide us Genomic, transcriptomic and epigenomic data of more than a thousand cancer cell lines. For the three data omics, we focused on gene mutation data, gene expression data, and DNA methylation data. we can get omics data by using microarray.

The goal of the model is to determine if the drug is effective for the cancer patient or not depending on cancer cell profiles (genomic mutation, gene expression and DNA methylation data). In the model we use CNN and GCN.

The result is the process become more accurate for doctors to determine if the drug will be efficient to a particular patient or not and the effectiveness of the drug. Through the android application we are developing, doctors can find it easily for showing their appointments in an organized manner and use the newest methods for diagnosis patient and recognize the disease. Also, patient can make an appointment online and choose which services he needs such as for test, rays or for diagnosis and medicine. Regarding the model, first, we used train\_test\_split to split the data and K-fold. Second, we used KNN with GCN, decision tree with GCN, random forest with GCN. The accuracy of Classification with K\_Fold is 1.0000 and regression is 0.9996.