Personalised Medicine with AI and ML

Currently, we are in a phase of revolution spearheaded by the wonderful opportunities provided by some fascinating pieces of technology mainly Artificial Intelligence and Machine Learning. The gold standard for Medical Trials have remained the same since the 20th century – Randomised Controlled Trials (RCT). While RCTs have done a great job of proving whether a particular medicine will work effectively for the average person, it doesn't necessarily give a good measure of performance for a specific individual. What differentiates one person from another? Their unique DNA. This DNA is fundamental to answer the question of "Will this medicine work for this person?". The results of RCTs will always favour the genetic majority as there is an element of randomness and that probability tends to go towards the majority. Therefore, considering genetic minorities, we have to use ML and AI to get a better picture. Here is my proposed solution. While conducting tests, we also take the DNA of each person and compare their DNA and the effectiveness of a drug on them. We gather this data and feed it to a Machine Learning model. This machine learning model, helps us find which exact part of the DNA results in a drug being less effective or more effective. We can then use this to create variations of the same drug that work for genetic minorities. We can't make it work for every possible person, but we most certainly can make it work better, for more people. This is just half of the story. How does a patient know, which variant suits them best? Again, Machine Learning comes to the fore. For the customer side, I propose an app, where you can input your DNA and it uses that information to find the optimal variant for that specific individual. This will help drugs be more efficient, while reaching more people. Let me explain with an example. Clinical trials have started for a new drug 'X'. We collect the DNA of all the participants and then match it with efficiency of the drug for that person. Then the AI finds that a particular Strand of DNA causes the drug to work less efficiently. Therefore, a variant is developed and works better for those with that particular strand of DNA. Now this process will have to be repeated a number of times. When the doctor prescribes this drug X, the patient can upload their DNA to their phone and the app will check which variant of Drug X, will work best for that person.