

PopMLvis (v2): A Tool for Analysis and Visualization of Population Structure using Genotype Data from Genome-Wide Association Studies

Project Description:

The aim of the project is to advance an existing Genome-Wide Association Study (GWAS) platform, known as PopMLvis. In general, the population structure can be inferred from the GWAS dataset and focused on the genetic variation within and between populations by investigating the distributions of alleles and how their frequencies change over time. DenTech is designed to be user-friendly with aim to classify OC lesions in benign stages from photographic images and videos, and segment lesion areas. There are five main roles of the DenTech software users: namely, admin, nurse, dentist, specialist, and data scientist. Admin setups permissions and views of the platform. Nurse uploads images, or streaming videos of the patient's mouth, to be notified with the diagnosis in near real-time. Dentist performs initial human diagnosis and assess the DenTech platform diagnosis. Specialist affirms and corrects, if needed, the outputs (the dentist and DenTech diagnosis), which in turn are used by the data scientist to retrain the ML models. Data scientist taking care of technical issues such as updating ML models and database system. Moreover, DenTech platform could be used for educational purposes, therefore, a student role is added. In summary, DenTech platform: 1) Captures images and videos of individual's mouth. 2) Classifies and segments sixteen OC lesions in near real-time. 3) Provides easy graphical user interface to interact with. 4) Reduces general practitioners effort and time for diagnosing OC lesions. 5) Automatically updates ML models and equipped with a weekly performance report.

Duties/Activities:

The Intern will understand the scope of the project and the main components. He/she will work on the existing code and gets supervision from the mentor in understanding the code. Then, each intern will be responsible to develop one component as an outcome of this project, which would include:

- 1- Building mobile app that should works for IOS and Android systems exploiting the existing code.
- 2- Extending the DenTech web app that work on photographic images to include x-ray images.

Required Skills:

Python, JavaScript, React Native, PHP, and HTML, programming skills are required. Understand the basic machine learning / deep leaning architectures is a plus.

Learning Opportunities:

The intern will have opportunity to work with scientists and software engineers on promising research problems. In addition, it is great opportunity to participate in solving real-world problems.

Expected Team Size: 2-3

Mentors

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