Rapid Diagnostic Test Smart Reader

Development of an automated rapid diagnostic test reader for COVID-19 mass testing

Project key information

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Project duration: 24 Months
Starting date: February 2021

Partner institutions

- Fondation pour la Recherche l'Ingénierie et l'Innovation, Cameroon
- University of Yaounde I Cameroon / UMMISCO

Context

Diagnosis of COVID 19 is performed in Cameroon with two main tests, PCR and rapid diagnostic test (RDT). PCR has higher sensitivity but requires biosafety equipment, a high technical platform, and personnel well trained in molecular biology techniques. The RDT, on the other hand, is less demanding in terms of both technical equipment and qualified personnel. RDTs are particularly well suited for emergency medical screening and testing in primary care and resource-limited settings. RDT tests use cassettes and provide rapid results, typically within 20-30 minutes of specimen collection. The RDT- based testing strategy has allowed screening capacity to increase significantly, but encounters difficulties in terms of flow management and reporting data on those tested.

Objectives

I.   Design a device capable of receiving multiple TDR cassettes simultaneously, capturing an image of that object after a specified time, and transmitting that image to a mobile device via WIFI communication.
II.   Develop a TDR image classification model based on the features that appear in the TDR result window
II.   Develop a mobile application that allows interaction with the reader device, renders the result of TDR and synchronises the collected data with a remote server.

Organization

WPI	WPII	WPIII	WPIV
Mechatronic Objective I	AI and image processing Objective II	Mobile computing Objective III	Epidemiology Field Evaluation of device
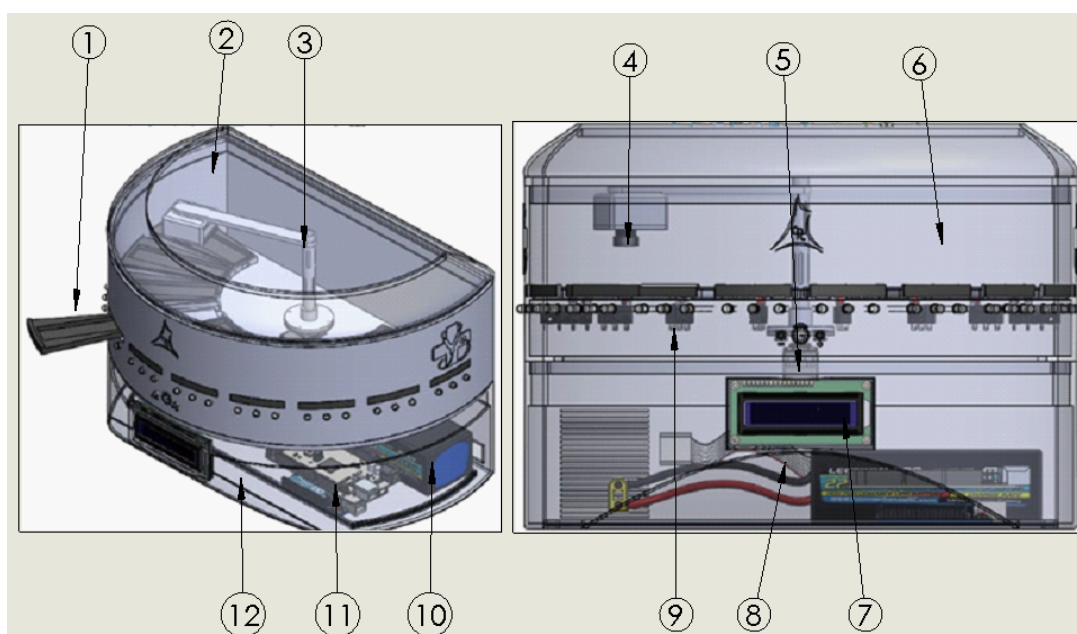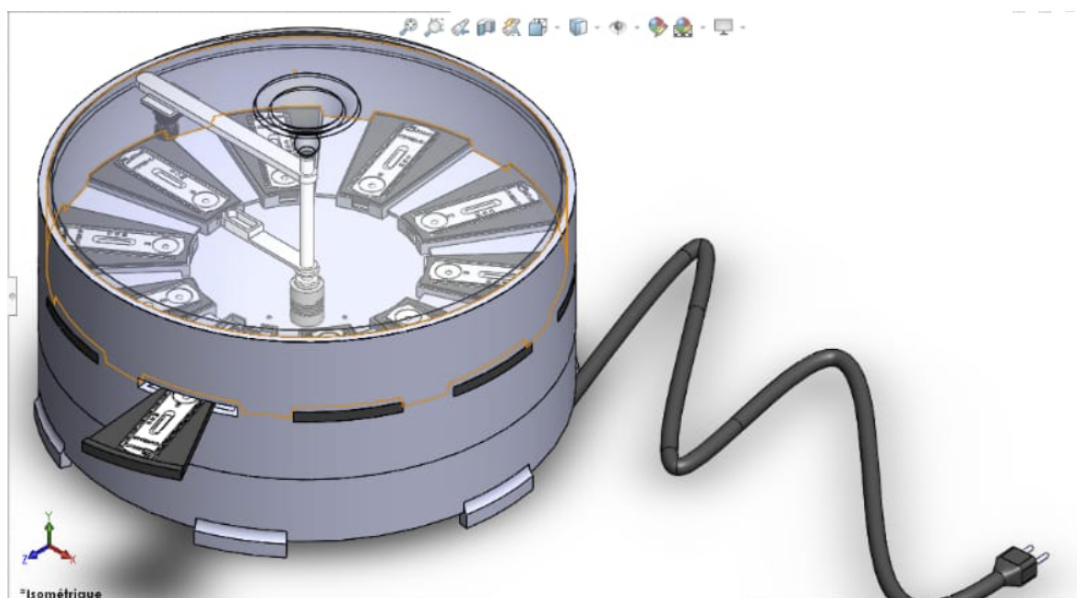
Légende

Numéro	Désignation	Quantité
1	Porte cassette	10
2	Capot	1
3	Bras pivot porte caméra	1
4	Caméra	1
5	Accouplement	1
6	Bloc milieu	1
7	Ecran	1
8	Servomoteur	1
9	Capteur de fin de course	10
10	Batterie	2
11	Microcontrôleur	1
12	Bloc base	1

Expected results

An automatic RDT reader consisting of an automatic RDT reader and a mobile application for interpreting images and reporting results.