

# Development of Diagnostic Tool Aiding Tumor Detection

<b>Status:</b>	Available
<b>Group Members:</b>	TBD
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## Project Description

### **Background:**

Through this research we propose to develop an intelligent, inexpensive and non-invasive diagnostic tool aiding tumor detection objectively in real time to ensure early diagnosis, better prognosis and higher survival rate. Early detection is the best defense against cancer. Imaging techniques play a vital role in early diagnosis, mammography being one of the main techniques used. Ultrasound and Magnetic Resonance Imaging techniques are also popular. Though popular these techniques have limitations in terms of large equipment size and weight, sensitivity, specificity, external administration of energy into the human body- biological effects being harmful, discomfort and pain of patients and not to forget relatively high cost that adheres these techniques to be used widely. The project will consist of development of an intelligent, inexpensive and non-invasive glove to detect tumors. The glove will consist of the micro sensors embedded on it, such that it can be worn by the practitioner during examination and real time results can be provided as to whether a tumor is present or not.

The initial hardware and software of the project is completed and is in the testing phase. The focus during this time frame will be on development of a preliminary physical examination practitioner's glove encapsulating the various identified microsensor. It will involve research into the material to be used for the glove development, designing of the sensors into the glove material overcoming the challenge to provide enough field of view to all the sensors. The research will also involve

Verification of repeatability and precision of the results from sensors heads.  
Determine accuracy of the sensor

Determine Drift and lag in individual sensor output  
Interference of individual sensors from each other  
Determine optimum number and position of infra red, pressure and electrical impedance sensors  
Determine the optimum number of fingers be used in the final prototype.  
Determine the optimum position of sensors on the physician figures  
Validation of the hardware and software working together to be done through proof of concept.  
Contacting local biomedical fabricators to make the final glove module

**Requirements:**

Hardware: Analog and Digital Circuits, PCB designing, Microcontrollers

Software: Matlab, C Programming, LabVIEW

Deliverable: Working Glove module with hardware and software integration.