Licensing and Technology Transfer Opportunity: Manipal University

Title of Technology Available: A System to Acquire and Analyze Images of Specimen under a Microscope

Brief Description of Invention:

The proposed invention comprises of a microcontroller based controlling mechanism to control the movement of stage of a microscope. The microcontroller is connected to a robotic arm – which consists of high precision motors which can be made to rotate at fixed speed and angles. The speed and step angle of rotation can be chosen with the help of switches. Video is acquired using a camera or may be directly streamed into a computer depending on the facility provided by the microscope. Once the video is saved into a device such as a computer, an image processing software (or a mobile application) facilitates analysis by extracting relevant images from the video file, creating a composite image at the highest magnification and then providing a zoom-out facility to view at different magnifications. Acquisition of images need not depend on availability of a computer. A camera is sufficient to store the video. This device can work as a battery powered acquisition system. Thus acquisition of the video is not dependent on regular power supply since microscope too can be battery powered.

Brief Background of Invention:

Microscopic study is a very commonly used approach in science to carry out analysis of very minute details of a specimen. Microscopic studies require the observer to move the slide under the microscope to study the different views of a specimen. The observer may have to prepare the specimen for the analysis using a few preprocessing steps such as fixing, washing, staining etc. The specimen which is ready for analysis is kept under the microscope and the sample is viewed through the eyepiece of the microscope. Using the facility provided in the microscope, the observer can adjust the focus and the magnification required for the specific study to clearly evaluate the feature of interest in the specimen. The observer usually starts the analysis by starting from one corner of the slide. To study the different regions of the specimen, the different views under the microscope needs to be studied. A microscope is designed with two screws for moving the platform holding specimen under the microscope so that the observer can traverse through the specimen with the help of these screws. Usually, the observer carefully observes the specimen starting from one corner and moves the platform in a specific pattern using the rotation of the screws provided for this purpose so that all the views of the specimen can be viewed one by one. During this procedure, the observer may wish to increase or decrease the magnification to study the specimen at different magnifications to evaluate the specimen.

Describe the final product:

This invention describes a low cost device to facilitate automated video acquisition of all the microscopic views of a specimen which can be used as an optional fitting to the existing microscope. Using a software method, the video thus acquired can be converted into series of images and each image can be zoomed in and out to give the user the feeling of using a real microscope and helping him analyze the specimen at different magnifications. Different views of the specimen can be recorded in a predefined speed and pattern to acquire all views of a specimen as required.

Technological Domain (Keywords):

Microscopy, Automation, Imaging

Proof of Concept: A device which can consists of motors and microcontroller which can control the screws of stage of the microscope is developed

Stage of Development: Prototype
Ideation/Prototype/Advanced Prototype/Ready to Market technology

Provide Information on Competitors who manufacture and/or sell similar products: NA

What are the unique advantages your innovation has compared to the competition:

The availability of low cost device to automatically obtain images of microscopic views would go a long way in making use of automated image analysis more practical, by eliminating the need of laborious and manual image acquisition process. Also, this invention is novel in that it does not require any other modification in the system and can be used as an optional external fitting to an existing microscope. This is a benefit over all other existing systems for automation of acquisition of images from specimen under the microscope.

A few potential companies who might be interested in this technology: Bosch, Philips

Intellectual Property Status: Indian Patent application with number filed in (mention year)
2044/CHE/2014