Gaze: A Low Cost, Digital Optical Device Supporting Education in Developing Countries

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Outbreaks of Zika and Malaria in third world countries have proven how borderless our world has become. Scientists are paramount in combatting these global challenges. The reality exists that few scientists are on the ground with limited access to basic scientific equipment, like microscopes. Provision of this equipment could boost sanitation awareness, parasite identification and increase recruitment to the scientific community. This project set out to design an affordable, easy to use and portable microscope. Such a device would significantly support understanding of biological science in relation to human health and disease. The parameters of an effective, affordable microscope, such as functionality, durability and portability all had to be taken into consideration. A number of designs and prototypes were manufactured and tested to include the nature of the materials, the quality of the lenses and the accuracy of the mechanisms to produce coarse and fine adjustment. In terms of functionality, the final product had to encompass acceptable magnification, accurate focus, minimal stage drift and optimum illumination control. The main features of the final product included an adjustable iris mechanism as the diaphragm and lenses from a laser pointer which produced a magnification of up to 300x. Coarse and fine stage adjustment were achieved with a dual manual and motorised mechanism. A special mount was incorporated which allowed for the integration of multiple cameras from pre existing technology such as iPads and smartphones. The final low cost solution exceeded expectations coming in under $10 and therefore providing an affordable option.

Awards Won:

Third Award of $1,000

SPIE, the international society for optics and photonics: Fourth Award of $500