



**INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI
SHORT ABSTRACT OF THESIS**

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Programme of Study : Ph.D.

Thesis Title: Design of Human-Centred Augmented Reality Learning System for Laboratory Training based on Smart Object Interfacing

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SHORT ABSTRACT

This thesis presents a basis for design of a novel smart learning system for educational practical electronics laboratory sessions. The system consists of augmented reality and an intelligent breadboard that are used in conjunction to help students perform and learn practical experiments with ease. The intelligent breadboard senses errors such as wrong or loose electrical connections occurring while prototyping electronic circuits and are highlighted to students via text and voice-based interface on a digital tablet. Further, a mobile augmented reality application provides interactive visualization to students regarding circuit assembly, operating test equipment and theoretical concepts overlaid onto real world. The work presented is a part of a series of cross-sectional user usability testing studies and design investigations made towards developing smart learning system for use in complex learning environments and envisioning future learning technologies.