

**OPTICAL FIBER SENSING SET UP FOR RIVER MONITORING  
MODEL**

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## **ABSTRACT**

This paper presents optical fiber sensing set up for long distance river monitoring model. The fiber optic system can continuously monitor water quality parameters along the river in real time. In recent years, fiber optic technology is widely used for communication system but not for sensing application. Therefore, the aim of this project is to develop a model equipped with optical fiber network that can be applied to long distance river monitoring. The scope of work is focused on the wavelength detection set up for optical fiber sensing application and development of light source. The project methodology is mainly covers measurement set up of fiber bragg grating(FBG), development of amplified spontaneous emission(ASE) light source and overall system set up for long distance river monitoring. To illustrate the functionality, the light signal is transmitted into optical fiber network with FBG sensors at different sites connected along the network. For every changes in parameters such as pH value, oil spills and water level, the information created shifted wavelength from FBG that is detected by wavelength meter within the range( $\Delta 0.05$ - $\Delta 0.718$ )*nm*.

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# **CHAPTER 1**

## **INTRODUCTION**

### **1.1 BACKGROUND AND MOTIVATION**

This project is part of a project entitled Long-Distance River Continuous Monitoring Using Fiber Optic Sensing System participated in Innovate Malaysia Design Competition 2014. In recent years, fiber optic technology is widely used in Malaysia for many type of application. In recognition of the sector's potential, the Malaysian government has identified photonics as one of the country's priority sectors for development. In line with this policy, the government is actively fostering photonics-related R&D activities at universities and research institutions and upgrading the skills of Malaysian workforce. As such, manufacturers are invited to take advantage of the country's capabilities by outsourcing their manufacturing activities to Malaysian companies or by setting up their operations in Malaysia, either as wholly-owned subsidiaries or joint-venture with Malaysians.

During the Ninth Malaysian Plan, the government has allocated RM474 million for R&D activities in ICT, including photonics-related R&D activities. Another RM 180 million has been set aside for ICT training or services to assist private ICT companies finance the training of their R&D personnel. In addition, universities are forging ties with the private sector to develop market-oriented research in the photonics sector.

### **1.2 PROBLEM STATEMENT**

Considering fiber optic is widely used for long distance telecommunication, it is also being explored for monitoring long distance sensing application. The problem with the current situation is the existing fiber optic system setup in the Faculty of Electrical