

## **STATEMENT OF RESEARCH INTEREST**

During my undergraduate study, I got an opportunity to work on a research project with one of my faculties. I started working on wireless sensor networking under his supervision. It was on making a review of the applications of wireless sensor networks in the smart grid. Later, I worked on the photonic crystal fiber sensor under the supervision of the same faculty. We proposed our designed PCF sensors for detecting various chemicals. We used COMSOL Multiphysics v5.4 for modeling the sensors and simulation purposes. In one paper, we detected breast cancer cells and in another one, we classified different types of alcohol. We evaluated the effectiveness of those sensors and also calculated relative sensitivity, confinement loss, effective material loss, effective area, and birefringence.

All the works I had done before were theory-based and also done by using various simulation software. Getting involved with the work of PCF sensors, I find photonics as a very interesting and engaging research field. But the thing that makes me feel my work incomplete is the lack of knowledge of the experimental domain. If I get the opportunity to get admission into the M.TECH degree, I want to acquire more theoretical knowledge which will help me to do some research work on the experimental domain of this field in the future.

In the Electronics & Electrical Communication Engineering department of IIT Kharagpur, there are advanced optical fiber and photonics labs. Some faculties are doing modern and very advanced research work on biomedical science and sensing applications, nano and quantum photonics, optical biosensors, etc. Detecting biochemical and various organic compounds is very important for diagnosis in medical science. The importance of effective detection with fewer errors by using biosensors is continuously increasing day by day. Proper sensing and detections are required. At the same time, effectiveness and sensitivity are very crucial factors of the sensors. So, there needs to research a lot on those issues. As I have done some work on photonics in previous years which are linked with applications of photonics in biomedical and sensing regions so, the experience of my previous work will help me to continue my further research in my master's program in this fields. For this interdisciplinary research work, I believe that the EECE department of IIT Kharagpur is the most suitable place for me for further study.