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| **Author(s) Name:** | N. Alim and M. N. Uddin | | |
| **Contact Email(s):** | drnasir@aiub.edu | | |
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| **Abstract:** |  |
| Surface Plasmon Resonance (SPR) is a quantum optical effect that directly enables bio-molecular interactions without labeling immobilized probe molecules. It can be widely used as a biosensor to detect molecular absorption or desorption on sensor surface [1]. The phenomenon is also imperative for technologies ranging from gene assays, DNA sensing, bacteria sensing, surface controlled electro-chemical sensing [2]. In this paper, SPR based D-shaped optical fiber sensor has been proposed to detect the refractive index of urine (refractive index). The biosensor proposed in this work uses Amplitude-Wavelength Hybrid dual detection technique to determine the change in urine refractive index. Through knowing urine RI (refractive index) urine specific gravity can be determined. Urine specific gravity can work as a possible indicator for several human diseases, especially renal function oriented disease. The sensor uses Kretschmann detection scheme to investigate the change in optical characteristics of the proposed optical sensor through observing refractive index change of sensing dielectric substance [3]. In this work, results show a clear relationship between light wave characteristics and variation in RI (refractive index) of urine samples ranging from 1.3300-1.3489. Intensity of the reflected light drops from 85% to 40% as urine refractive index attains higher values. At the same time, wavelength of incident light approaches towards shorter values with the increase of urine refractive index during Wavelength detection. The proposed optical sensor/ micro-fluidic biosensor represents as an appealing solution for sensitive detection of change in specific gravity of urine sample for indicative possible health issue monitoring. The sensor can be embedded in home or public urinal to warn the user about possible health issue, so the user can take immediate action. | |