The proposed contribution deals with the texture analysis of colour retinal images provided by digital fundus camera. The main purpose is focused on the analysis of texture representing retinal nerve fibre layer. An early detection of changes in the texture caused by nerve fibres atrophy is important in diagnosis of glaucoma. The proposed texture analysis is based on local binary patterns and Gaussian Markov random fields approaches providing textural features allowing quantitative representation of retinal nerve fibre layer texture. The features are presented and supervised classification experiments are performed with satisfactory results. The cross-validation procedures were implemented in order to evaluate classification ability. The classification error reaches less than 3% allowing discrimination between healthy and glaucomatous tissue of the retinal nerve fibre layer. An experiment providing detection of the retinal nerve fibre layer loss in diagnostically important region around the optic nerve head was performed and the qualitative results comparable with experienced ophthalmologist's diagnosis was achieved.