

Real-Time Multi Pose Face Tracking System for Medical Tele-Diagnosis Robot in LabVIEW Platform

Abstract

Background: Rise of telepresence robot in healthcare industries is gaining attention in these days due to its extensive usage especially in hospitals for patient monitoring and diagnosis. Medical Telediagnostic Robot (MTR) was developed to attend patient during medical emergencies at rural area. This robot was designed with low bandwidth and on a low cost platform allowing the robot to accommodate the application in developing countries. The visual communication system in MTR has a basic face-to-face communication which does not track or recognize the patient. Medical specialist uses a joystick to control the movement of camera in order to have a continuous contact with the patient. To circumvent this problem, a real-time face recognition and tracking system was developed for MTR. This system comprises of several automated modules to perform face recognition and tracking. This paper discusses the last module of the system which is the tracking module. The objective of this paper is to design a face tracking system that is efficient in real-time environment. A two Degree of Freedom (DOF) servo mechanism with Pan and Tilt was implemented to increase the tracking view which enables the system to track faces at dynamic background. Besides, the tracking module can track face images that appear at different pose, distance and motion blur. Template matching method based on color and shape was used to track the image within the defined search area. The system was tested experimentally and delivers an excellent accuracy for MTR application.