# Low-Cost Real-Time Silent Communicator for Complete Quadriplegia (Paralyzed) Patients

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There are millions of fully paralyzed patients around the world and their life is difficult, as they are fully dependent on others for even their basic needs. They struggle to communicate with others as, in most cases, they cannot talk or their speech is slurred. Even in the United States, there is no affordable product available in the market today that will enable a fully paralyzed patient to communicate effectively with others, including their caregivers. The statistics are even grimmer for a patient from a poor or developing country. There is a real need for a communicator device that can be used by a paralyzed patient, an elderly person in hospice care, or a bedridden patient. This is where my innovation will fit in. I created an innovative medical communicator device that can be used by a completely paralyzed or bedridden patient by focusing a camera onto the patient's face. The device will enable a paralyzed patient to communicate with their caregiver and also enables the patient to perform home automation actions. An interactive user interface guides the patient to make appropriate selections, which will eventually communicate to the external display device. From my various experiments, the device performed best when the face was distanced within 20 inches from the camera. Under ideal conditions, the device’s accuracy was 100% when the illuminance was between 566 and 850 Lux. My novel idea has massive potential and it will help to improve the quality of life of a number of fully disabled patients. The device can be developed in any country using locally-sourced materials for less than $30. This new device will give a ray of hope to those unfortunate patients whose lives changed upside down when they became paralyzed or bedridden.

**Awards Won:**

Third Award of $1,000

Central Intelligence Agency: First Award: $1000 award

NC State College of Engineering: Alternates (not read aloud)