# Optical Wireless Communication

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## *Abstract*

Our project investigates a mobile optical wireless networking system enabling reliable transfer of data among multiple nodes with no prior knowledge of node locations. Each node is equipped with a multi-transceiver optical wireless communication (OWC) module with electronic beam steering capability. The multi-transceiver design facilitates in establishing multiple simultaneous OWC links with different neighbor nodes. The proposed system ensures error-free data transfer through fast line-of-sight (LOS) discovery, robust maintenance of OWC links, and utilizing reliable communication protocols. A preliminary prototype of our multi-transceiver multi-node OWC system was implemented by using serial line internet protocol (SLIP), transport control protocol (TCP), and Internet Control Message Protocol (ICMP). SLIP is the basis for all communication in the system, and it allows for the other protocols to be used. For the discovery process, the system makes use of the TCP handshake to establish connections between the nodes. To maintain the connections, a customized application of ICMP was used. The effectiveness of this system was analyzed with results obtained from testbed experiments using the developed prototype. The results from these experiments showed that the proposed system can effectively enable reliable communication among multiple nodes.