As the cost and quality of light-emitting diodes (LEDs) improve, they will likely replace traditional incandescent or fluorescent lighting due to the greater efficiency of LEDs. LEDs can be used to control the properties of the generated light much better than fluorescent or incandescent lights can; this ability allows LEDs to be used to embed data within light, enabling visible-light communications (VLC).

VLC has many potential applications. For example, it can be used to provide wireless communications wherever indoor lighting exists, providing the communications infrastructure for a smart room.

By adding compatibility with Internet Protocol (IP) networks to the VLC system and by implementing mechanisms to support mobile nodes, the range of applications that can be supported by VLC is vastly increased. For example, this addition will allow handheld devices to access the Internet.

This work is supported by the NSF under grant No. EEC-0812056. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.