3D printed Cybernetic Hand

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Abstract:

The cybernetic hand is a closed-loop Internet of Things (IoT) enabled mechatronic system that involves control and communication between the human and the machine. It explores a novel way of designing a cost-effective consumer-grade 3D printed Cybernetic hand that mimics a user's finger-hand movements through wirelessly interfaced hand and glove using a client-server model. Additionally, it explores the use of light-weight cyphers in establishing a secure real-time communication stream in a client-server architecture for IoT devices.

The unique features of the cybernetic-hand-design include: i) a light-weight wireless encryption algorithm that uses a range of commonly used cryptographic cyphers, ii) real-time sensing and actuation of the cybernetic hand using commonly available microcontrollers configured in a client-server model, iii) recyclable and biodegradable Polylactic acid (PLA) or PLA based wood filaments for sustainability. In a nutshell, this paper presents a bespoke example of human-machine interaction that is fast, secure, sustainable, and cost-effective.