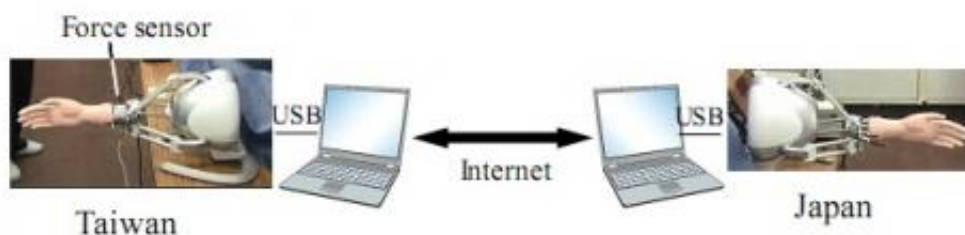


Electronic gadget for shaking hands over the Internet

December 22 2014



Main parts of the Internet based handshaking system. Credit: (c) Toyohashi University of Technology

Takanori Miyoshi at the Department of Mechanical Engineering, Toyohashi University of Technology, has developed an innovative gadget that enables people to 'shake hands' over the Internet, irrespective of their location.

Miyoshi recently displayed his handshake gadget in April 2014 at the 2014 Niconico Chokaigi, Tokyo. "We connected people located in Japan and Taiwan," says Miyoshi. The participants in Tokyo included Japan's Prime Minister.

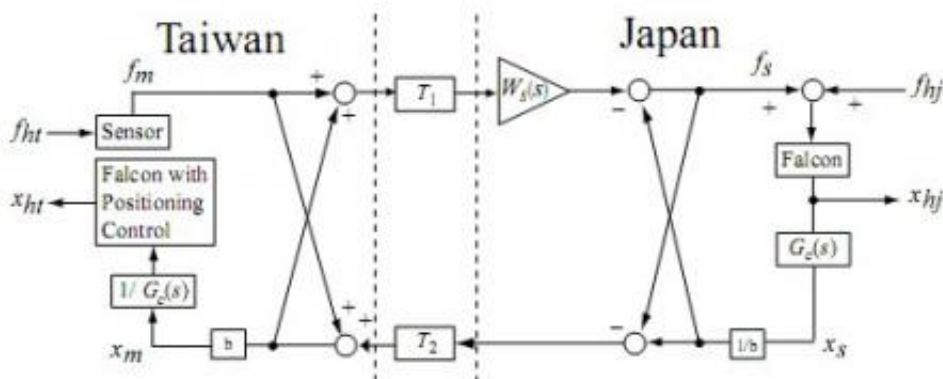
Notably, approximately 96% of the participants showed 'excitement for the device' and more than 65% could feel 'mutual force and motion'.

The handshake gadget developed by Miyoshi is simple, and constructed using components readily available on markets. The main parts include the well-known Falcon haptic device, a force sensor, and tele-control algorithm.

However, the development of the handshake system demanded the resolution of a problem related to 'howling' in the control electronics that led to instability in the 'virtual handshake'. This problem can be understood as being similar to the loud howling noise that is sometimes generated when a microphone comes too close to a loudspeaker in an auditorium.

"I solved the problem of howling by constructing a unique low pass filter," explains Miyoshi. This is the triangular component shown as $W_s(s)$ in Figure 2. "The filter keeps the gain at less than unity, and thereby prevents instabilities in the circuit."

Miyoshi intended to develop the [handshake](#) system for applications including Internet games, remote surgery to give doctors greater feeling during surgical procedures, and hand operated robotic arms used in nuclear power stations managing radioactive materials.



Low pass filter developed by Takanori Miyoshi to prevent 'howling' in the handshake system. Credit: (c) Toyohashi University of Technology

Provided by Toyohashi University of Technology

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