

# Bristol researchers enhance the performance of Imogen Heap's musical gloves

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Wireless technology is becoming increasingly common in live musical performances but the technology is prone to interference, which can affect a live concert. A research team have demonstrated the potential Wi-Fi has to offer for live performances and specifically for the musical gloves used by the artist Imogen Heap.

The research was a joint collaboration between the University of Bristol and the University of the West of England (UWE Bristol). The team, led by Professor Andrew Nix, Dr Thomas Mitchell and Sebastian Madgwick, have improved the performance of a pair of Wi-Fi gloves that are famously used by Imogen Heap in her on-stage performances.

The paper, entitled "Making the Most of Wi-Fi: Optimisations for Robust Wireless Live Music Performance", will be presented at the 14th International Conference on New Interfaces for Musical Expression [NIME 2014] in London today [Wednesday 2 July]. The enhanced musical gloves were used during a live performance by Imogen Heap last night at a concert to open the conference.

The researchers were asked to develop the musical gloves by making the Wi-Fi link as robust and reliable as possible. A Wi-Fi link in a live performance situation must be able to cope with interference from an audience that may include hundreds of Wi-Fi enabled mobile phones.

Simon Rankine, a MEng Electronics and Communications Engineering undergraduate student, worked on the problem last summer. Using support from Broadcom, the research team modified a Wi-Fi access point to allow the use of high-gain directional antennas. The researchers also showed how the link can be improved by modifying a number of Medium Access Control (MAC) parameters. Details of this work can be found in the paper.

Andrew Nix, Professor of Wireless Communication Systems and Head of the Department of Electrical and Electronic Engineering, said: "We have a world-leading Wi-Fi research group at Bristol and this project really caught our imagination. With help from Broadcom, Simon was able to modify a standard access point to ruggedise the link to and from Imogen's Wi-Fi gloves. It's fantastic to see one of our undergraduate students contributing so strongly to our research output."

In future work, the researchers propose to rigorously evaluate the complete system (network infrastructure and antenna) in the context of 'real-world' performance scenarios. In particular, the research team are interested in examining the use of a Wi-Fi interface device called x-OSC as an enabling technology for collaborative live performance using a

wireless sensor network.

**More information:** "Making the Most of Wi-Fi: Optimisations for Robust Wireless Live Music Performance," Thomas Mitchell, Sebastian Madgwick, Simon Ramkine, Geoffrey Hilton, Adrian Free, Andrew Nix, NIME 2014, June 30-July 03 2014, Goldsmiths, University of London, UK. [cnmat.berkeley.edu/publication...s\\_live\\_music\\_perform](http://cnmat.berkeley.edu/publication...s_live_music_perform)

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