News Release

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Fitness trackers could benefit from better security, study finds

The security of wearable fitness trackers could be improved to better protect users' personal data, a study suggests.

Vulnerabilities in the devices – which track heart rate, steps taken and calories burned – could threaten the privacy and security of the data they record, scientists say.

Exploiting security weak spots in the communication procedures of some gadgets could allow unauthorised sharing of personal data with third parties. These include online retailers and marketing agencies, the team says.

Such frailties could also be targeted to create fake health records. By sending insurance companies false activity data, fraudsters could obtain cheaper cover from insurers that reward physical activity with lower premiums, researchers say.

A team at the University of Edinburgh carried out an in-depth security analysis of two popular models of wearable fitness trackers made by Fitbit.

The researchers discovered a way of intercepting messages transmitted between fitness trackers and cloud servers – where data is sent for analysis. This allowed them to access personal information and create false activity records.

The team also demonstrated how the system that keeps data on the devices secure – called end-to-end encryption – can be circumvented. By dismantling devices and modifying information stored in their memory, researchers bypassed the encryption system and gained access to stored data.

Researchers have produced guidelines to help manufacturers remove similar weaknesses from future system designs to ensure users' personal data is kept private and secure.

In response to the findings, Fitbit has developed software patches to improve the privacy and security of its devices.

The findings will be presented at the International Symposium on Research in Attacks (RAID) on 18-20 September. The research was carried out in collaboration with Technische Universitat Darmstadt, Germany, and the University of Padua, Italy. The Edinburgh researchers were part-funded by the Scottish Informatics and Computer Science Alliance.

Ranked among the top universities in the world

Dr Paul Patras, of the University of Edinburgh's School of Informatics, who took part in the study, said: "Our work demonstrates that security and privacy measures implemented in popular wearable devices continue to lag behind the pace of new technology development. We welcome Fitbit's receptiveness to our findings, their professional attitude towards understanding the vulnerabilities we identified and the timely manner in which they have improved the affected services."

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