

My Project

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10:07 AM

- Overview
 - Mobile Payments: Apple and Android Pay
 - Available for everything from gas to groceries to restaurants
 - Slow adoption rate in UK -> security concerns and fear of theft
 - This focuses on the security concern
- Security concern
 - "Eavesdropping"
 - Very similar to what humans do when listening to other people's conversation
 - This is where hackers intercept the data sent by consumers and know what is being transmitted
 - Android and Apple Pay both use NFC
 - NFC inherently cannot protect itself against eavesdropping
 - There are some add ons that help provide security such as establishing a secure channel using a symmetric key like 3DES or AES
 - Hackers though can still get in if they know the key
 - Can't detect eavesdropping
- Solution
 - Quantum technology: Oxford University collaboration, including Dr. Iris Choi, along with Nokia and Bay Photonics
 - sends millions of single particles of light to send encryption keys
 - Can detect activities like eavesdropping and shut down the system to prevent hacking
- How it works
 - Uses moveable mirrors and ultrafast LEDs to send a secret pin-code at rate of 30 kb.s
 - 6 pairs of LEDs that are polarized differently and at different positions
 - The circularly polarized LED is the main key
 - Others used to check the security and correct any errors in transmission
- How does it provide greater security

- Quantum key is long: prevents hackers from figuring out the key pattern randomly
- Innovative Steering system: prevents hackers from cracking code
 - The lights have to go at an exact position - even if they get moved a little bit the system fails
 - If hacker gets the code, they alter the quantum signal and makes the code now unusable
- Humans have natural motion in their hand even when completely still
 - Research team found the exact measurements of this movement first
 - Used to optimise the design of the steering system
- Prototype
 - Handheld
 - Constructed using ordinary materials rather than custom
- Future
 - System can be shrunk down and become a part in the phone
 - As with most technologies: it is very difficult to do this and still have it work the same as the prototypes
 - Also be used for secure connections for NFC and Wifi networks
 - Higher adoption rate for mobile payments and increased public trust

[2] Apple Pay security and privacy overview: 2017.

<https://support.apple.com/en-us/HT203027>. Accessed: 2017-05-29.