

A few weeks ago some of us from the Adstock Science Club went to an interesting talk all about hiding secret information using modern day digital imaging, given by Dr Harin Sellahewa from the computing department of Buckingham University. The talk lasted just under one hour and proved to be fascinating.

He began by explaining the differences between the two main techniques used for hiding secret information from prying eyes. The first was Cryptography, or changing the data in a way that leaves it visible but incomprehensible.

The second was by hiding the information in plain sight. An amusing example he used to illustrate this was that sometime in the dim and distant past, if someone wanted to send a message or picture without it being noticed, they would have the head of their messenger shaved, then have the message tattooed onto their bald head and once the hair had grown back the messenger could be sent on their way in the knowledge that no amount of searching, by your enemy, would reveal any clues. Well, at least you hoped! However, this method was not great at sending messages that required a quick response.

The modern version of this is called Steganography and uses a similar principle of hiding whatever data you need to send, but in plain sight. He concentrated on one method of accomplishing this, by implanting a secret image within the body of another host image.

As modern day digital images are composed of many thousands if not millions of Picture Elements called Pixels and each one of these has an 8 bit binary code associated with it, that tells the viewing device, how bright or dark that pixel should be, it is possible to discretely insert pixels from another totally different image into the main picture without it being noticeable. Part or even the whole of the host picture can be used in this way to hide the secret information being sent. This, however is not the securest way of hiding the information, other methods based on this system can be used which offer greater security and Dr Sellahewa explained how these worked.

He also explained how the hidden data did not have to be sequential but could be placed anywhere within the host image, making it even more difficult for spies to find. Lastly he showed us how groups of pixels could be used to encode data into a more complex system, at this point I must admit I started to get slightly lost, but up to this point he did a great job of simplifying what was obviously quite a complex subject. One interesting point he did make right at the end, however, was that not only information such as text, pictures, biometrics etc. can be hidden in this manner but also computer viruses and other nasties, so be careful what you look at when browsing the web it may not be as innocent as it first appears!