UNIVERSITY OF LIVERPOOL

Department of Computer Science
Computer Science Taster Days

Wednesday 28 Feb 2024
Dixons Fazakerley

Programme of Activities

10.00 – 10.15	Arrival in our Lab & Welcome (including security induction & account registration)
10.15 – 11.00	**Workshop 1: Code breaking (Navi)**
11.00 – 11.30	**Giant Sorting Network** (outdoor activity)
11.30 – 12.00	Lunch Break
12.00 – 12.45	**Workshop 2: Logic circuits (Ben K)**
12.45 – 13.45	**Hands-on Workshop: Lego EV3 drives the warehouse**
13.45 – **14.00**	Closing Talk

All workshops take place in Lab 3 of the George Holt building.

Information about the Activities

Logic circuits

1 + 1 = 2

But how? You might know binary addition on paper, maybe even a bit of logic gates or Boolean algebra, and you've heard that computers 'are made of switches' and 'treat numbers as zeros and ones' or 'off and on', yet there's a missing piece to the puzzle to tie this all together.

This lesson aims to answer the 'why are we learning this?' of Computer Science through a practical activity constructing a relay based full adder circuit. Students will be provided with diagrams that closely relate the physical components in front of them to the mathematical and logical operations they will learn through the curriculum.

Code breaking

Cryptography is the practice of encoding information in order to secure it and prevent it being read by unauthorised parties. In history, secret messages were communicated using ciphers to minimise the risk of them being intercepted by the enemy. Today, encryption is a crucial part of online security, especially since most communication happens on the internet. In this engaging and hands-on lesson, students will be introduced to two basic ciphers and create their own cipher wheel. They will have the opportunity to use this tool to encrypt and decrypt secret messages, enhancing their problem-solving skills and allowing them to experience the thrill of code breaking.

Giant Sorting Network

In this outdoor lesson, pupils will play the role of the “compute nodes” in a parallel sorting algorithm. They will experience first-hand how parallelism speeds up computation, but also makes it more challenging to reason about programs.

Lego EV3 Drives the Warehouse

Robots managing large warehouses are one of the many examples where automation helps humans to solve a task faster and cheaper. For this to be effective, robots need to be at least partially autonomous, i.e., able to sense and react to the physical world without (constant) human intervention. In this hands-on lesson, pupils program Lego EV3 robots to follow a line, avoid obstacles, and ultimately navigate a warehouse safely and autonomously.