UNIVERSITY OF LIVERPOOL

Department of Computer Science
Computer Science Taster Days

Archbishop Blanch School
Wednesday 02 February 2022

Programme of Activities

09.40 – 10.00	Arrival in our Lab & Welcome (including security induction & account registration)
10.00 – 10.55	**Workshop 1: Cryptography: From Caesar to AES**
10.55 – 11.00	Break
11.00 – 11.55	**Workshop 2: Machine learning, Hands on!**
11.55 – 12.45	Lunch Break
12.45 – 13.40	**Workshop 3: APIs or How to program a drone in 20min**
13.40 – 13.45	Break
13.45 – 14.50	**Workshop 4: Lego EV3 Drives the Warehouse**
14.50 – **15.00**	Closing Talk

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

Information about the Activities

Cryptography: From Caesar to AES

How to securely encrypt messages so that the intended addressee (and only her!) can decipher them again has been a sought-after technology throughout human history. Computers have profoundly transformed cryptography by making both attackers as well as users of encryption schemes much more powerful. In this lesson, a series of unplugged puzzles will guide pupils from Caesar's cipher to modern cryptography.

Machine learning, Hands on!

Machine-learning techniques are driving much of the latest successes in computer vision. What only 10 years ago required expert knowledge and know-how to create is now available as existing building blocks – as a literal block in Scratch! The lesson will introduce key concepts about machine learning and feature a creative task in Scratch featuring image recognition.

APIs or How to program a drone in 20min

Application Programming Interfaces (APIs) are a hugely successful way of managing complexity. Pupils will experience this first hand by programming real flying drone after a few minutes of introduction to the corresponding drone control API.

Lego EV3 Drives the Warehouse

Robots managing large warehouses are one of the many example 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.