



Hillside High School
Wednesday 09 March 2022

Programme of Activities

09.40 – 10.00	Arrival in our Lab & Welcome (including security induction & account registration)
10.00 – 10.55	Workshop 1: A Sort of TikTok
10.55 – 11.00	Break
11.00 – 11.55	Workshop 2: Authentication: How secure are passwords?
11.55 – 12.45	Lunch Break
12.45 – 13.40	Workshop 3: Bluetooth: From ad-hoc networks to Covid
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

A Sort of TikTok

TikTok's For-You page tries to show the user videos that they will most likely want to watch. At the heart of this feature lies the task to quickly sort the huge collection of videos on the platform by the likelihood that this user will watch them. In this activity, pupils explore different sorting algorithms solve that task more or less efficiently, and how TikTok might compute the probability that a user likes a certain video.

Authentication: How secure are passwords?

Pupils explore hands-on how fast or slow passwords can be “cracked” depending on their length and character set, and how dictionary attacks can further speed up guessing passwords. The lesson further discusses how passwords are used for user authentication and what alternatives exist.

Bluetooth: From ad-hoc networks to Covid

Bluetooth has become a very popular technology, not least because of its great versatility. In this hands-on “maker” activity, pupils explore on Raspberry Pis how to communicate over Bluetooth and how to use signal strength for measuring distance; the same principle that enabled the NHS Covid App.

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.