**Ideas for the Potential Future Application of Machine Learning to Enhance Project Functionality - Hannah Rodtmann**

To further develop our IoT sound sensor alarm system, we would integrate **Machine Learning (ML)** and **Internet-based functionality** to create a more intelligent and connected device. A key enhancement would be using a **Convolutional Neural Network (CNN)** to classify different types of sounds, and then use the **Internet** to log or act on that data intelligently.

The CNN model would be trained on a **dataset of labelled audio recordings** (e.g., “glass breaking,” “talking,” “door closing,” “shouting,” etc.). These audio samples would be converted into **spectrograms** (visual representations of sound), which allow the model to learn and recognize patterns in different sound types. Once trained, the CNN would be deployed to analyse real-time sound input from the sensor.

**Internet functionality** would enhance this by allowing the system to:

* **Log classified sound events to a Google Spreadsheet** using a service like IFTTT or a webhook, helping users view activity over time.
* **Send an email or app notification (e.g., via Blynk or IFTTT)** only if the system detects a “dangerous” or unusual sound—helping reduce false alarms and provide useful remote alerts.
* Optionally, a **Web Dashboard or Blynk App** could display sound classification logs, system status, and allow users to adjust the system sensitivity remotely.

This combination of ML and IoT would turn the basic alarm into a **smart, connected, and adaptive safety system**, capable of learning over time and providing real-time feedback through cloud-connected services. It also creates opportunities for advanced features, such as customizing alert types or integrating with other smart home devices (e.g., lights, locks, cameras).