*On an easter morning, you are rudely woken by the merciless beeping of your alarm clock. In a reflex, you grab your phone from the nightstand to check up on your social media. You catch a glimpse of the time on your phone, and cry out in horror as you realize that your alarm clock does not account for daylight savings. Fueled by adrenalin you sprint downstairs, and are subsequently greeted by the smell of fresh coffee, which your coffee machine is programmed to make you every day. You resist your craving for caffeine and enter your car. You enter your sister's new address on your satellite navigation and drive off in silence, as your little one recently discovered the disc drive slot on the car stereo and decided it would make an ideal place to dispose of chewing gum. As much as that confused the car stereo, your GPS system is equally bewildered to find you taking a right turn where you should only have gone slightly right.*

Nowadays, embedded systems are ubiquitous. They make sure you awake in time, satisfy your caffeine addiction and guide you from A to B. These devices all work flawlessly, were it not for one misbehaving part: Us. These machines have to work with our complicated time zones and daylight savings, deal with improper usage and even know the things we forget to tell them in order to do their jobs right! Surely, we can not expect any machine to account for all of this? Therefore, the best we can do is make machines as fault-tolerant as possible, and clearly communicate with the user when something inevitably goes wrong.

This project is about sorting black and white discs. The machine made in this project is not only able to sort, but it can also detect errors during its process and give an adequate response. The machine is therefore able to tell something about its operating state, which is considered difficult.