Light sensing of pollen using artificial intelligence

Summary (<200 words 1 picture)

Hay fever can affect around 15% of the UK population, therefore there is a need to be able to identify pollen grains in real-time for understanding pollen levels, for mitigation and helping diagnose hay fever symptoms.

In my work, I focus on developing a novel method for pollen sensing using light and artificial intelligence. By utilizing a white light LED, I illuminate pollen grains and capture their scattering patterns with a Raspberry Pi camera. These patterns are then transformed into high-resolution images, equivalent to 20× microscope magnification, using deep learning techniques.

This approach is particularly exciting because it offers a low-cost, compact solution for monitoring airborne pollen. This can significantly help in mitigating hay fever symptoms. Additionally, the technology has potential applications in environmental science, health science, and agriculture by providing real-time data on pollen and other airborne particulates.

Tweet(<280 characters)

By illuminating pollen grains with a white light LED and capturing the scattered light with a Raspberry Pi camera, high-res images of pollen grains are produced using deep learning.

Biography (<100 words)

Dr. James A. Grant-Jacob is a Senior Research Fellow at the Optoelectronics Research Centre, University of Southampton. His diverse research portfolio includes high harmonic generation, laser fabrication, DNA sequencing, MRI and AI. He has collaborated with NASA on laser manufacturing for greenhouse gas detection. Utilising NVIDIA grants, he has enhanced laser-based processes through deep learning. In 2019, he presented his AI-based particle pollution detection research at STEM for BRITAIN in the UK Houses of Parliament.