**Script:**

Hello, this is Amber and thank you for the opportunity to present.

Our team explored how diffusion-weighted MRI can be leveraged to extract meaningful insights about brain tissue health.

The project is split into two parts: Part I focuses on brain MRI analysis, while Part II applies similar techniques to image-based feature extraction. Let’s begin with Part I.

Here we estimate the diffusion tensor, a mathematical model that captures how water molecules move through the brain.

To do this, the MRI first captures a baseline scan of the brain, then applies a series of directional magnetic shoves, typically six or more, to observe how water motion responds in each direction.

These movement patterns reveal subtle structural changes in neural tissue, which are vital for diagnosing conditions like stroke, tumours, or neurodegeneration.

What makes this powerful is not just the insight we gain, but how we extract it from raw, complex imaging data.

Our process transforms signal variations into clear diagnostic maps, paving the way for earlier, more confident clinical decisions in digital health.

I’ll now hand over to Anish to show how our team brought this to life.

Anish (Part I solution):

* Solution outline in laymen’s terms.
* What’s new / innovative?

Charlie (Part II problem)

Ren’s Script:

*“Thank you, Charlie,*

*Picture a moustache as a visual marker for a specific brain disease in an MRI scan; one that is too intricate to discern if such abnormality was in-fact a potential indicator of disease.*

*We tested our moustache detector on an entire face database, showing a 97.4% accuracy with minimal errors.*

*We then tested unique faces. Looking at the figure, it shows a flawless accuracy of 100%.*

*If awarded the contract, our group can adapt this method with machine learning to real world MRI data to accurately detect brain diseases at machine-level speeds. This unprecedented approach could redefine how we diagnose complex brain diseases, revolutionising the healthcare industry.*

*Faster, earlier and more accurately than ever before.*

*Thank you for your time and consideration.*