

We have an app!

Using funding from SQA, SSERC has been working with a software developer to create a simple app to help students understand average speed. *SSERC Speed Camera* works like a real speed camera. It captures two successive images of a moving object. If we know the time between each image and the distance travelled in that time, the average speed can be found.



Figure 1 - The icon for our app.



Figure 2 - Calibration screen.

It is important to realise what this app (Figure 1) isn't. It's not a highly accurate measuring tool suitable for gathering data in an Advanced Higher investigation. It is designed to encourage students to think about the concept of speed whilst taking real-life measurements.

When the app is started, tap the **Calibration** button. The calibration screen appears (Figure 2).

There needs to be a stationary object of known length situated in the plane where motion will take place.

Move the markers to the ends of the object. Enter the length in metres in the **Distance Between Markers** box. If you can rest your tablet or phone on a wall or bench whilst

doing this, it will be much easier to set the markers as the camera is still "live" during this process.

Users will have to decide the appropriate time interval between images. Whilst there may be an element of trial and error in this, students should be encouraged to think about a suitable time interval. The time is set using the slider control.

Touch the **Back** button. When the moving object enters the field of view on the tablet or phone, simply touch the screen. Two pictures, overlaid, will be taken (Figure 3).

Move the markers to the same point on each image. The average speed will be displayed. To make another measurement, touch **Reset**. There is no need to recalibrate if the motion will be in the same plane.

We said earlier that this is not designed to be an accurate measuring tool. That is not to talk it down. It can be used to promote discussion about measuring speed and indeed uncertainties. What would be the effect of the moving object being behind or in front of the object chosen for calibration? Can you use this app to measure the speed of objects coming towards you? If you were in a moving vehicle, could you use it to measure your speed? What are the relative advantages of long and short

time intervals between pictures? Whilst the app can be used in the classroom, we hope users will take it out into the real world to measure the speed of cars, bikes, runners and more. Perhaps some students will download it from the App Store (IOS) or Google Play (Android) to their own devices. Having had a simple introduction to motion analysis, learners may be better prepared for powerful applications such as Tracker [1] and Vernier Video Physics [2].

This is new territory for us. Please let us know what you think of *SSERC Speed Camera* and we also welcome suggestions for future apps. ◀

References

- [1] See SSERC Bulletin, **225**.
- [2] See SSERC Bulletin, **240**, ("Start taking the tablets?").

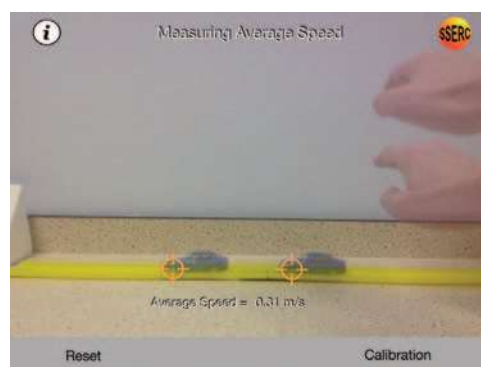


Figure 3 - Superimposed images.