

Lane Following

The Tullamarine Freeway (airport for Melbourne) is demonstrating an interesting aspect of road user plasticity.



The road is being widened (on the left), so the lanes have been squeezed to the right. Where work is being conducted, signs indicate that drivers should stay between the yellow lines, otherwise they should respect the white lines. Obvious inferences apply – where a yellow line overwrites a white line, it becomes an honorary white line. If you can read a sign and update your processing methods in a few seconds, this is pretty easy. What if you can't? If you can't what – read a sign, or update your processing methods in a few seconds? Or both?

The solution of staying between lines that are at least the width of the vehicle is one, but it biases towards collision with the vehicle on the left, which may be centred between the yellow lines (and may be an airport bus, which pretty much fills the reduced-width lane).

The ability to allow a textual interface to modify line recognition based on colour and inference is typical of a general purpose processor (a processor which handles vision, reading, signal processing all in one - a person) within a context (a yellow line means something else somewhere else).

While on the subject of lines – roads in NSW near schools are marked with a sign and a row of triangles to indicate a low speed zone at certain hours in the day while school is in. This was too hard for many motorists, so a flashing light was installed at the start of the zone to indicate within the hours and school is in. If the zone is long, there may be cross streets where drivers turn into the zone and don't see the flashing light. Alternatively, they stop at a traffic light within the zone, and normal revhead behaviour takes over when they start off again.

Now we have a decision problem – the triangles are seen. We remember the hours, it is not the weekend, is it a school holiday? Public and private schools have different holidays, and Easter moves around from year to year. If there is other traffic, and it is unusually slow, probably follow their lead.

When people talk about machine learning, they tend to skip over all the other things that would need to be known (and the machine is unlikely to be able to correlate on its own, unless it stays up nights watching the moon so it can forecast Easter).

We could switch maps! The Tulla application is too dynamic for that. Possible for speed zones, but that means a very long road of different maps, some of which will clash, requiring a decision on the spot. And there's the rub – can we avoid a general purpose processor, capable of using text to modify its lane following (or whatever)?

We could refuse to allow anything that doesn't fit in our capability! More likely, but you have to get dominant before you can make that play.

So how many current Lane Following systems, whether addons for normal cars or used in autonomous vehicles, would be suitable for the Tullamarine Freeway. A random guess suggests zero, as they have no link to reading a sign or discriminating between colours, or understanding a yellow line is really a white line in disguise (sometimes).

Plasticity.