14-01-2008

Dear Chairperson,

I have some serious reservations about the reliability of this recognition technology as I believe that there are very little technical guidelines for the design of Queensland number plates. Historically number plates in all States were designed to be very readable with the naked eye and always featured a large plain font with optimal contrast on a plain background. This design criteria has virtually disappeared and there are now much smaller number plates to suit the 'sleeker' cars as well as a plethora of 'personalized plates' with picture or logo backgrounds and a host of different colours. These background designs can easily confuse the overlying letters or digits for an observer.

I had this experience recently when I tried to record the number plate details of a car which was involved in a traffic incident. The car had personalized number plates with the Lions Football Club logo design as the background in a maroon and yellow colour scheme with white lettering. I recorded what I thought were the letters and numbers but it was not until I was very close that I could see that I had recorded the digits incorrectly. My error was due to the very contrasting nature of the yellow lion logo on the maroon background and the yellow leg of this lion logo was confused as part of the white digits immediately above it. I will include an example of this style of number plate below to demonstrate my point, however this particular combination of letters and numbers is just an example, not necessarily the worst or best, there are probably numerous combinations which get confused.
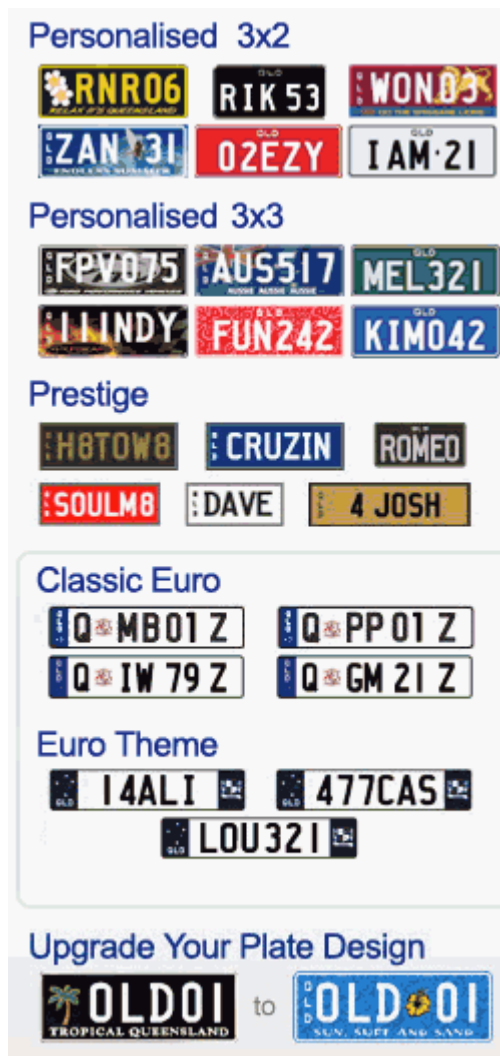

In this example you can see that the white numerals are largely over a yellow lion logo and there is very little contrast between the two. The yellow legs of the lion in this example further confuse the numerals when viewed from a distance. (The Regulations do require that the plate be readable from 20m under the proscribed angles and lighting conditions and in my case, this style of plate was not.)

If I was to run this image above through any basic Optical Character Recognition (OCR) software on my computer it would fail to read the digits, whereas an image of a standard number plate with a plain background would work 100% of the time. Now that is not to say that this personalized plate could not be recognized by a much more sophisticated program but it does reinforce the fact that this style of plate with a background image is certainly more difficult to read both for the human observer and a computer program and these are 'ideal conditions' 'pristine' images, real images and real conditions could only make the task more challenging.

I was wondering how such difficult to read number plates were getting approved and

released into the market. I approached Personalized Plates Queensland (PPQ) who are the section of Queensland Transport who generate these new plate designs and asked if they had any strict criteria in relation to the design of the background image and the choice of colours. I was told by the Manager there that they did indeed have very strict design criteria which ensured that all plates released to the market were suitably 'readable'. I pointed out my bad experience and included the example shown above asking if they considered this any less readable than a plain background plate. I also directed the Manager to their own web site which shows a large number of their different number plate designs side by side (see below)

I asked the manager to step back from the computer screen and see which plate designs were the hardest to read. The manager there at PPQ said that using a computer image was not a good indication of readability (that would seem to have some very real concerns then for a project based on using computers to read number plates) but reassured me that there was a very strict design procedure in place. I asked if I could have some details of what these design criteria were, ie what the specified contrast ratios were for the background image and the chromaticity limits. I was then told that PPQ and Queensland Transport do not have these criteria at hand for their designers and these criteria were set and managed by the Queensland Police Service. As strange as this seemed, I was told that new designs were developed by PPQ and once

developed to the point of actually manufacturing a number plate, this sample or samples were then sent to the QPS who then tested them to ensure (presumably) that they met this strict criteria I was assured of. I wondered how this worked with just a sample plate as the digit combination might be quite readable for say the digits '11' but near impossible for say any 'rounded' digits such as the '33' in my example above. I thought, surely the background design and readability would be determined at the design stage by running the background image through a computer program to measure it's contrast ratio and colour combination etc. I then contacted the QPS to ask if this was the case and how they managed to determine the readability of a whole set of number and letter combinations if they were only submitted a limited sample. I also asked if they had some definite criteria for contrast etc or whether their testing was merely under 'red light camera' conditions. The QPS declined to provide me with any details of their testing and approval criteria or to confirm that they were the sole body responsible for the design criteria of these personalized plates. They also would not comment of just how the process worked if the designers at PPQ were not privy to any such design criteria that the QPS had set. It all seemed very hit and miss and probably quite subjective. The QPS would not comment on the readability of the Lions number plate example I sent them.

I don't believe much of what I was told by PPQ and there was not much given by QPS to believe. I have every suspicion to believe that there is NO 'strict design criteria' in place to ensure that these personalized plates are highly readable and that it is purely at the whim of the designers within PPQ. Nobody was able to explain how the Lions plate example was tested and proven to be every bit as readable as a plain plate design as I was told by the Manager at PPQ. I indicated to both PPQ and QPS that my enquiry was also going to be used as the basis for a submission to this Committee but this obviously had little to no effect in soliciting an exact explanation of the design process and approval process. Perhaps your Committee could have better luck in extracting this information from PPQ, QT and QPS as I feel that it is a point which must be fully understood if we are going to adopt this technology and expect it to work with all the future designs from PPQ that are hitting the market at a fast rate.

Now while many of these plate designs can be more readily read under 'flashlight' conditions due to the retro-reflective nature of the letters and digits I feel that this may actually encourage the continued proliferation of these evermore fancy and indeed 'commercial interest' backgrounds at the expense of naked eye readability and its consequential impact on road safety.

I look forward to your consideration of my issues and trust that you are able to obtain a suitable explanation where I was not able. If you require copies of any of my written correspondence with PPQ or QPS please feel free to contact me either by email or phone.

Sincerely

Kim Laurie