2020 CNNC: Round 3 Problem—ACVs

Confidential Information for Teleos's Representatives

Motorco has paid $10 million of an agreed $20 million to Teleos for the right to use TeleoLogic, and has promised an additional $5 million to Teleos for a version customized especially for Flyt. Teleos sees TeleoLogic as revolutionizing the ACV industry, and Flyt represents the most promising means to test and use this advanced AI system. The development costs have been huge, though, and there have been some difficulties and some policy or design issues.

One of the difficulties has to do with object recognition, particularly at the extremes of the dark-light spectrum. For example, recent simulations suggest that TeleoLogic cannot discern the difference between a dark tunnel and a wall, or between the side of a large white semi-trailer and a snowy sky. In both cases, the system could cause the vehicle to crash, in the one case by turning or swerving when it would be inappropriate to do so; in the other case, by proceeding when it would be appropriate to slow down or stop. In both cases, potentially fatal injuries could ensue. Another difficulty is decision-making in the case of a pedestrian standing at a curb. This seemingly mundane occurrence triggers a response in a human driver that is extraordinarily complex, involving a split-second decision about what to do based on such factors as whether driver and pedestrian make eye contact, the presence of other traffic on the road and its speed, the age of the pedestrian and his or her apparent attentiveness, and weather conditions—to name just a few factors.

If you reveal the possibility that Flyt could crash or that a pedestrian could be killed because of these difficulties, Motorco could refuse the whole system, and Teleos would have to eat the cost. Indeed, Teleos might even go out of business. On the other hand, if you say or do nothing, someone could die or be seriously injured. Both Motorco and Teleos would be sued; Teleos, much smaller in size and without access to the same kind of insurance as Motorco, would not likely withstand the claims—it would become insolvent.

A key issue that Teleos has been grappling with is the difference between "top-down" and "bottom-up" approaches to AI. In a top-down approach, developers strive for pre-programmed rules that imitate cognitive responses; the idea is to go from the top down and add detail into each layer of abstraction. For years, the top-down approach dominated, but over time, the bottom-up approach is proving more able to deal with the kinds of complexities inherent in the example of the wall-versus-tunnel problem or the problem of the pedestrian standing at the curb. But the bottom-up approach takes a long time for the AI system to learn appropriate responses to any given situation. As originally conceived, TeleoLogic started with a top-down approach, but has been evolving more towards a bottom-up approach, including some recent developments involving neural networks that are encouraging but that have not yet been patented or copyrighted. All of this may eventually lead to a hybrid approach that relies on both forms of AI design.

So far, Teleos has been able to convince Motorco that the delay in delivering an acceptable version of TeleoLogic is due to an attempt to work out the differences between these approaches to achieve the optimum balance of cost and safety. But to really get the job done without unduly compromising human safety, Teleos needs another $5 million from Motorco (over and above the $25 million that has already been promised—$20 million for the right to use TeleoLogic and another $5 million for the customized version for Flyt). Much of this is likely to be spent on bottom-up approaches to solving problems like those of object recognition in the dark-light spectrum and the pedestrian standing at the curb. This will take at least six months and possibly a year or more. Maybe if the two other groups apply enough pressure, Motorco would reconsider the terms of the deal. Or maybe Teleos will have to reach some sort of deal whereby Motorco gets exclusive rights to TeleoLogic for a limited time (perhaps up to two years), even though Teleos would prefer to be able to sell its system to other car manufacturers.

As if this weren't enough to deal with, Teleos has one more problem: there has been somewhat of a rift between its co-founders, and there is a risk that one of them could be wooed away by another development company or even by Motorco itself. Without giving anything away, you may need to address this possibility in any amendments to the agreement between Motorco and Teleos.

The ideal outcome for Teleos is one in which it gets another $5 million for the Flyt project, has at least a year to refine the system (in any case no less than six months), is able to attain an automation standard of SAE 3 through a co-testing arrangement with Motorco or the government, retains its co-founders and other key personnel, has the support of CDC and CEAI, is free to take whatever programming approach seems best, and keeps the right to sell or adapt TeleoLogic to other car manufacturers.

You may provide additional non-self-serving information and details consistent with the facts stated above and in the General Information for All Parties.