ONERA
THE FRENCH AEROSPACE LAB

www.onera.fr

PHD OPEN POSITION

Convergence between avionic and automotive networks

Référence : TIS**-DTIM-**2019**-**52

ONERA :

Location : Toulouse / France

Contact : Marc Boyer Email : Marc.Boyer@onera.fr

Subject : Vehicular systems, automotive or avionics, are currently embedding between dozens and hundreds of computers cooperating to ensure different functions, as flight control, driver assistance, auto-pilot, etc. This cooperation generates a large amount of messages, using embedded communication networks. Since these messages require on time delivery, specific communication technologies have been developed (CAN, ARINC 429, 1553). In particular, the aeronautical industry has specialized the Ethernet technology, initially designed for Internet world, and standardized the AFDX technology (ARINC 664 P7). In automotive industry, the currently used solutions are not sufficient enough, in particular with the increase of vehicle autonomy, which requires more sensors, more computations, and then more data exchange. This industry is also looking at Ethernet-based solutions (AVB, TSN). In parallel, avionic industry is looking at a successor for AFDX.

Nevertheless, these technologies are so complex, and the systems so large, that event the technologies has been designed to offer bounded response time to data flow, the exact (or even approximate) computation of these delays requires the development of specific algorithms.

The subject of this PhD is the development and the evaluation of such algorithms using the Network Calculus theory. It will consists in extending previous results, developed for AFDX and AVB, and doing there evaluation on realistic use cases.

French speaking is not required if the English level is good enough for daily technical exchanges, oral presentations and writing.