

OO Design for IoT

Collaborative Discussion:

Making reference to the article by Fortino et al. (2015), consider the strengths and weaknesses of designing a metamodel to support object-oriented design of the IoT. Design a smart model equivalent to that presented in Figure 6 which would instead support operation of a driverless car.

The Internet of Things has the potential to connect millions of objects over the Internet. As everything is connected and data is generated, people can use this data to monitor, analyse and optimise these objects. The result is higher productivity, better healthcare, more efficient homes and lower energy consumption. However, connecting those objects takes much planning beforehand (Molano, J. I. R. et al., 2018: 710-712).

Thus, a smart object (SO) that manages all the communications, connections, sensing, actuation and processing of the objects and user interactions helps to associate is necessary. Fortino et al. (2015) 's proposal design based on metamodels provides an excellent overview and a guideline to support the SO development phases of analysis, design and implementation.

The strengths of the metamodel are readability, flexibility, reusability, planning tool and easier debugging. By contrast, the weaknesses are time-consuming, severe discipline requirements to get full advantage, and susceptible to complex increase.

The following diagram shows a smart object model to support the operation of a driverless car. However, it is only a concept, as much more complex tasks are required for the complete operation of an autonomous vehicle (Fortino et al., 2015).

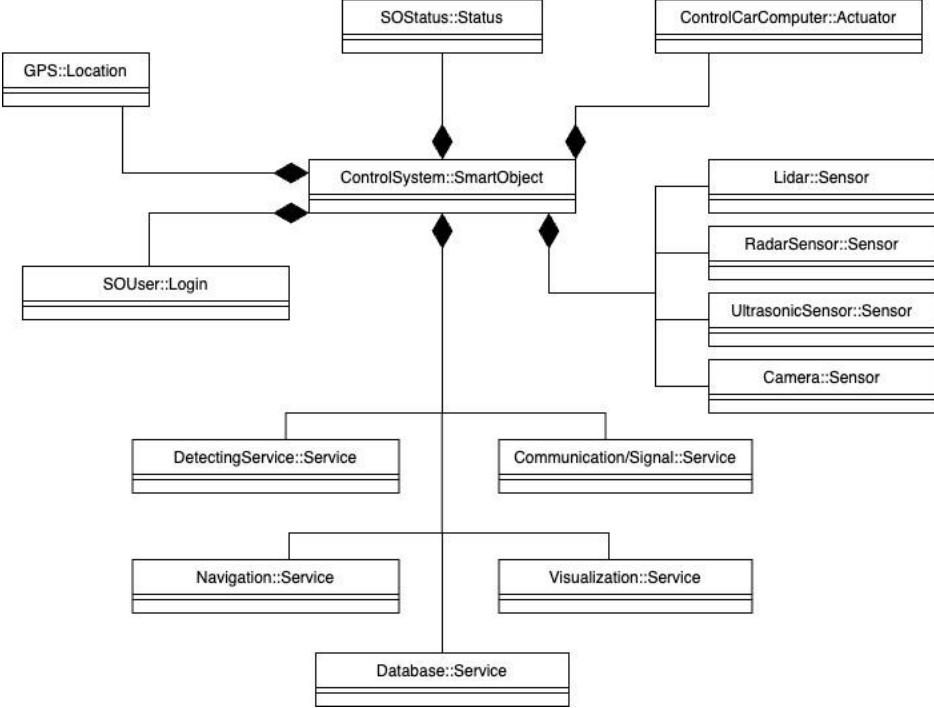


Figure 1: Smart Object Model - Driverless Car (own representation based on Fortino et al., 2015)

References:

Molano, J. I. R., Lovelle, J. M. C., Marín C. E. M., Granados, J. J. R., Crespo, R. C. (2018) Metamodel for Integration of Internet Of Things, Social Networks, the Cloud and Industry 4.0. Journal of Ambient Intelligence and Humanized Computing 9(3): 709-723. DOI:10.1007/s12652-017-0469-5.

Fortino, G., Guerrieri, A., Russo, W. & Savaglio, C. (2015) Towards a Development Methodology for Smart Object-Oriented IoT Systems: A Metamodel Approach. 2015 IEEE International Conference on Systems, Man, and Cybernetics. 1297-1302. DOI: 10.1109/SMC.2015.231.