

A Novel Approach to Virtual Simulation Systems- Digital Twinning

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Abstract: *Complex Manufacturing Systems can be better engineered with simulation techniques Relaying only on physical system to collect real world and capturing models is out of date. Moreover, a complex system has recursive model design, which leads to consume more time and more maintenance, unplanned down times and poor operating efficiency. The New Industry 4.0, digital twin creates virtual mirror of actual system. Here we have demonstrated digital twinning of UAV(Parrot ARDrone 2.0). Digital twin is virtual replica of physical assets and it can be simulated with real time data using industrial Internet of Things. Simulation with real time data improves operating efficiency, reduces unplanned down time hence increased revenue to manufactures*

Keywords: Digital Twin, simulation technology, virtual replica, UAV

REFERENCES

- [1]. MATLAB/Simulink. www.mathworks.de/products/simulink/
- [2]. Banks, J. Discrete-Event System Simulation, Prentice-Hall: 2010
- [3]. S. Kadry; A. El Hami (Eds.) E-Systems for the 21st Century: Concept, Developments, and Applications. Apple Academic Press, 2015
- [4]. B. Srivastava and J. Koehler, "Web service composition-current solutions and open problems," in ICAPS 2003 workshop on Planning for WebServices, vol. 35, 2003, pp. 28–35.
- [5]. Simmechanics. www.mathworks.de/products/simmechanics/
- [6]. Schlette, C., et al. "Virtual commissioning of automated micro-optical assembly." SPIE LASE. International Society for Optics and Photonics, 2015.
- [7]. D.E Sanabria Ardrone Simulink development kit v 1.1 [On-line]. Available : <http://www.mathworks.com/matlabcentral/fileexchange/43719-ar-drone-simulink-development-kit-v1-1>
- [8]. Motion Analysis systems . [Online] . Available <http://www.motionanalysis.com>
- [9]. S.J Mills , J. J Ford, and L. Mejias " Vision Based control for fixed wing UAVS inspecting locally linear infrastructure using skid-to-turn maneuvers ", Journal of Intellegent and Robotic Systems vol.61 , no- 1-4 , pp 29-42 , 2011
- [10]. T. Roth, E. Song, M. Burns, H. Neema, W. Emfinger and J.Sztipanovits, "Cyber-physical system development environment for energy applications," in ASME 11th International Conference on Energy Sustainability, Charlotte, NC, 2017.