

ABSTRACT PRESENTATION

Title: Performance characterization of advanced Electro-Optical and Infrared imaging systems

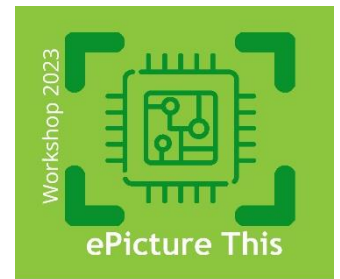
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Company name / Institute: TNO

Project name: MANTIS Vision

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Abstract can be published on website: **YES** **NO**



an initiative by PENTA label projects
MANTIS and IMAGINATION with AENEAS support

The ever increasing complexity of imaging systems seriously complicates the realization of reliable methods to predict and test the operational performance of these systems. Such methods are inevitable during the development, procurement and life cycle of camera systems. However, the current most popular approaches rely on a linear systems assumption, are essentially static and therefore don't do justice to modern cameras that use advanced digital signal processing techniques.

TNO is an internationally leading party in the development of models and tests that accurately characterize operational performance of advanced imaging systems in the visible and thermal infrared range. Our suite currently exists of i) a bias-free performance test, ii) an analytical model for simple cameras, iii) an image-based simulation model that allows the modeling of complex sensor, (black-box) image enhancement and image compression effects, and iv) a conversion model from the laboratory performance measure to Detection, Recognition and Identification (DRI) ranges of real objects under operational circumstances. For instance, the image-based simulation model helps system integrators during the design phase to make SWaPC (Size, Weight, Power and Costs) trade-offs against performance for the tasks at hand, and can show customers what the result of the camera will look like before it is being built.

Within the MANTIS project, the team will extend the current image-based simulation model to cope with dynamic imaging and object motion. This is important for a fair comparison between competing imaging systems because human observers and advanced signal processing techniques often make use of image sequences and motion. In addition, we will supply performance calculations to support the system development choices in the project. For example, to select the best microbolometer thermal imager objective for the use case at hand.