# Evaluation metrics for the practical application of URREF ontology: An illustration on data criteria

De Villiers JP
Focke RW
Pavlin G
Jousselme A-L
Dragos V
Laskey KB
Costa PC
Blasch E

ABSTRACT:

The International Society of Information Fusion (ISIF) Evaluation Techniques for Uncertainty Representation Working Group (ETURWG) investigates the quantification and evaluation of all types of uncertainty regarding the inputs, reasoning and outputs of the information fusion process. The ETURWG is developing an Uncertainty Representation and Reasoning Framework (URREF) ontology for this purpose. This paper outlines a start towards the process of defining metrics for the URREF data criteria, which will align the URREF ontology with practical application. A criterion can be evaluated according to several metrics, and a metric can be applied to several criteria. As such, the ontology would have to reflect the nature of a many-to-many mapping between criteria and metrics. The main findings and suggestions of the paper advancing the use of URREF are: 1) The Weight of Information (WoI) is dependent on data criteria, which in turn depend on source criteria. 2) Criteria and metrics that apply to evidence (typically an input of the fusion system), could equally apply to the fusion system outputs or internal information, which in turn could form the inputs of another system. As such the word "Evidence" in the terms "Piece of Evidence" and "Weight of Evidence" should be replaced by the word "Information". 3) Accuracy and precision and associated metrics are ubiquitous in the URREF ontology and can evaluate many parts of the fusion system. 4) The

weight of information also assumes an important position in the ontology, as it depends on several source and data criteria.