



The Application of Category Theory and Analysis of Receiver Operating Characteristics to Information Fusion (Paperback)

By Steven N Thorsen

Biblioscholar, United States, 2012. Paperback. Condition: New. Language: English . Brand New Book ***** Print on Demand *****. Multisensor data fusion is presented in a rigorous mathematical format, with definitions consistent with the desires of the data fusion community. A model of event-state fusion is developed and described . Definitions of fusion rules and fusors are introduced, along with functor categories, of which they are objects. Defining fusors and competing fusion rules involves the use of an objective function of the researchers choice. One such objective function, a functional on families of classification systems, and in particular receiver operating characteristics (ROCs), is introduced. Its use as an objective function is demonstrated in that the argument which minimizes it (a particular ROC), corresponds to the Bayes Optimal threshold, given certain assumptions, within a family of classification systems. This constraint is extended to ROC manifolds in higher dimensions. Under different data assumptions, the minimizing argument of the ROC functional is shown to be the point of a ROC manifold corresponding to the Neyman-Pearson criteria. A second functional is shown to determine the min-max threshold. A more robust functional is developed.



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