Least Sensitive (Most Robust) Fuzzy "Exclusive Or" Operations

Jesus E. Hernandez(1) and Jaime Nava(2)

(1) Department of Electrical and Computer Engineering
University of Texas at El Paso
El Paso, TX 79968
jehernandez7@miners.utep.edu

(2) Department of Computer Science
University of Texas at El Paso
El Paso, TX 79968
jenava@miners.utep.edu

In natural language, "or" sometimes means
"inclusive or" and sometimes means "exclusive or".
To adequately describe commonsense and expert knowledge,
it is therefore important to have not only t-conorms
describing fuzzy "inclusive or" operations, but also
fuzzy "exclusive or" operations f(a,b). Since the degrees of
certainty are only approximately defined, it is reasonable
to require that the corresponding operation be the least sensitive
to small changes in the inputs. In this paper, we show
that the least sensitive fuzzy "inclusive or" operation has the form
f(a,b) = min(max(a, b), max(1-a, 1-b)).