Dataset

Apply Property

D = C0, C1, C2,....C9

Random noise (Guassian)

Transformations (rotation, brightness)

T (D) = TC0, TC1, TC2,....TC9

STAGE 1: Local Robustness (LR)

Robust

Non-Robust

Model (TC0)

LR=87 %

TestCases (TC0)

Model (TC1)

LR= 90%

TestCases (TC1)

Model (TC8)

LR= 80%

TestCases (TC8)

Model (TC9)

LR= 70%

TestCases (TC9)

STAGE 2: Global Robustness (GR)

M(img1) = correct, M(img2) = correct

M(img1) = incorrect, M(img2) = correct
M(img2) = incorrect, M(img1) = correct
M(img1) = incorrect, M(img2) = incorrect

For example:
M(TC8) + M(TC1) = TC8+ TC1
LR 80% + LR 90% = ???

Possible unique pairs

(0, 1), (0, 2), (0, 3), (0, 4), (0, 5), (0, 6), (0, 7), (0, 8), (0, 9),
(1, 2), (1, 3), (1, 4), (1, 5), (1, 6), (1, 7), (1, 8), (1, 9),
(2, 3), (2, 4), (2, 5), (2, 6), (2, 7), (2, 8), (2, 9),
(3, 4), (3, 5), (3, 6), (3, 7), (3, 8), (3, 9),
(4, 5), (4, 6), (4, 7), (4, 8), (4, 9),
(5, 6), (5, 7), (5, 8), (5, 9),
(6, 7), (6, 8), (6, 9),
(7, 8), (7, 9),
(8, 9)

Correct

Incorrect

M(TCn) + M(TCn) =TCn+TCn
i.e.. n = 0,1,2,3,4..9

Adder (M(TCn),M(TCn))

TestCases (TC0)

TestCases (TC1)

TestCases (TC8)

TestCases (TC9)