# Assessment of the Perfomance of Artificial Neural Networks on the Accuracy of RSS-based Visible Light Positioning with Random Transmittor Tilt

## Introduction:

### Objectief:

De perfomantie van de accuracy van een ANN in VLP wanneer er een onbekende random transmittor tilt aanwezig is bij de verzendende LED’s

## System Description

Setup en berekening van de resultaten

* 4 Led’s in 7mx7mx6m in FDMA
* Random tilt voor transmittors (case 1: 1°, case 2: 2°)
* ANN trained for 500 random transmittor orientations
* 4 inputs
* 2 hidden layers of 6 &3 neurons
* Hyperbolic tangent als activatiefunctie
* 2 outputs

## Results and Discussion

* Accuracy improves with bigger size of training set:
* Increasing trainingset reduces the probability of having outliers.
* ANN performance best towards the center of the test frame and that there is a decreased accuracy at locations close to where the led’s are mounted

## Conclusion

* Capable of achieving accurate 2D positioning even when the training set is sparse
* The ANN performs significantly better than a standard trilateration approach and easily obtains localization errors below 1 cm
* The ANN shows no significant changes in localization error when the orientation is increased from \sigma =1° to 2°