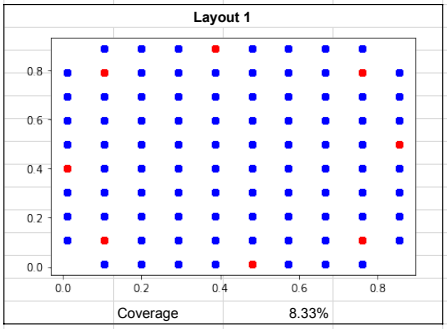
Pulse localization based on CNN regression.

Sensors	**6**
Input size	**8x16**
Threshold	**0.15**

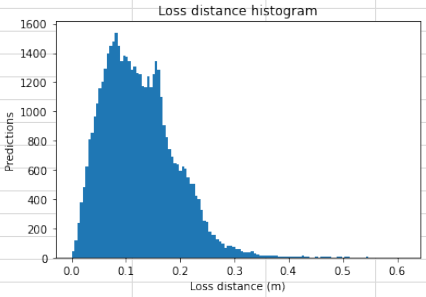
(For accuracy, the localizations inside (Euclidean) distance loss of 0.15 m are considered correct predictions.)

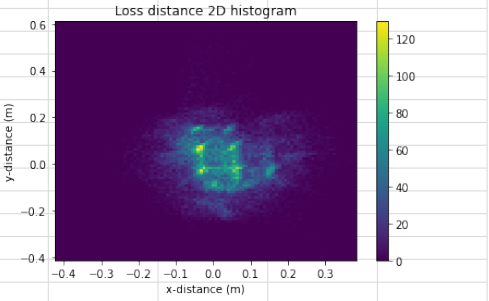
Note: Red sample points are considered for training.

Layout 1

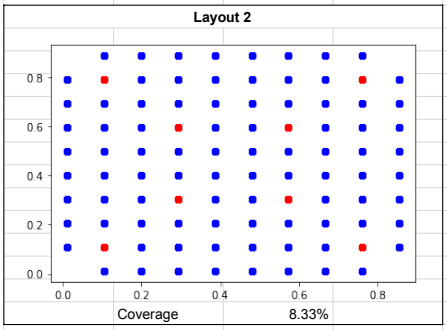


Data type	MSE	Ave error (m)	Max error (m)	Accuracy
Float32	2.13E-02	1.29E-01	6.05E-01	64.30%
Int8	2.09E-02	1.28E-01	6.06E-01	64.73%
Float6 (E4M1)	2.01E-02	1.25E-01	6.12E-01	67.02%
Int8 (regularization)	2.00E-02	1.25E-01	6.15E-01	67.15%

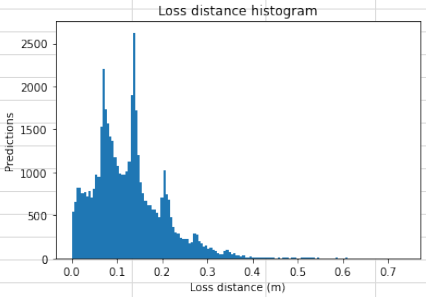


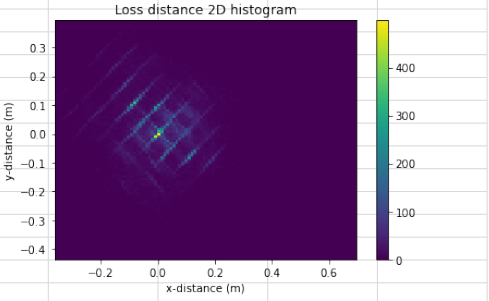


Layout 2

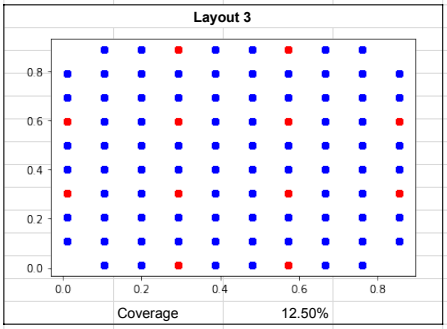


Data type	MSE	Ave error (m)	Max error (m)	Accuracy
Float32	2.16E-02	1.27E-01	7.38E-01	67.65%
Int8	2.17E-02	1.27E-01	7.51E-01	67.45%
Float6 (E4M1)	2.18E-02	1.25E-01	7.34E-01	70.50%
Int8 (regularization)	2.19E-02	1.25E-01	7.35E-01	70.59%

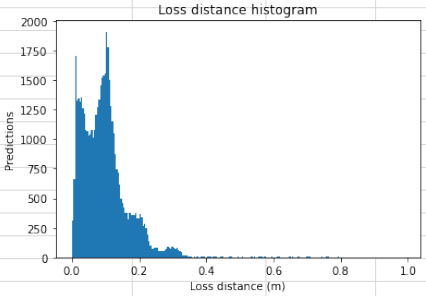


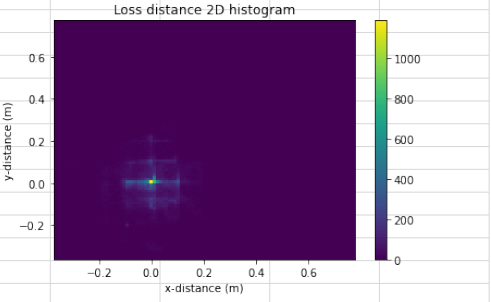


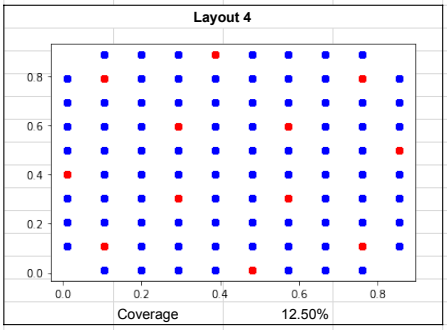
Layout 3



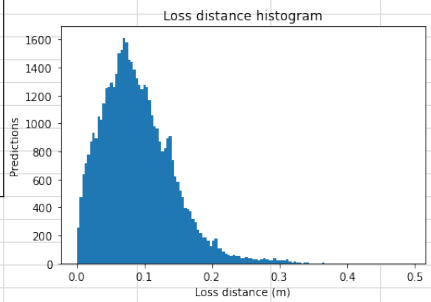
Data type	MSE	Ave error (m)	Max error (m)	Accuracy
Float32	1.54E-02	9.86E-02	9.94E-01	82.75%
Int8	1.55E-02	9.89E-02	9.97E-01	82.61%
Float6 (E4M1)	1.49E-02	9.77E-02	9.86E-01	83.39%
Int8 (regularization)	1.51E-02	9.81E-02	1.00E+00	83.21%

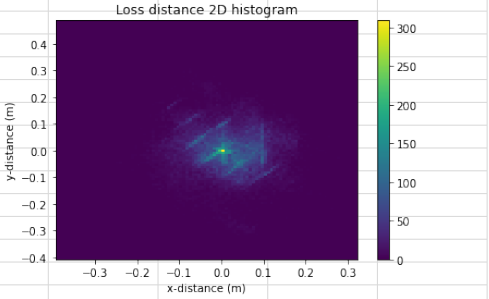


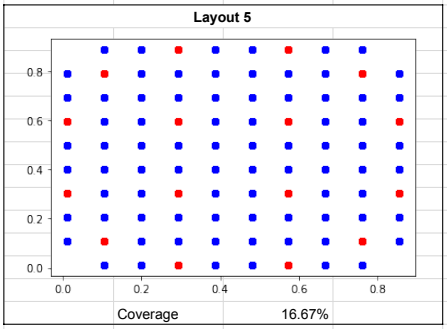




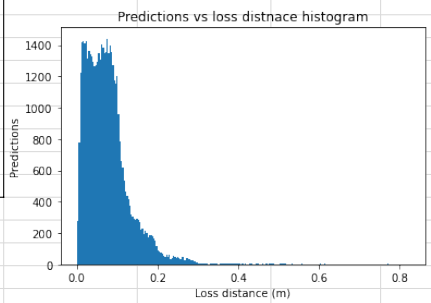
Data type	MSE	Ave error (m)	Max error (m)	Accuracy
Float32	1.23E-02	9.50E-02	5.60E-01	85.21%
Int8	1.23E-02	9.51E-02	5.61E-01	85.18%
Float6 (E4M1)	1.09E-02	8.98E-02	4.91E-01	88.10%
Int8 (regularization)	1.08E-02	8.93E-02	4.73E-01	88.23%

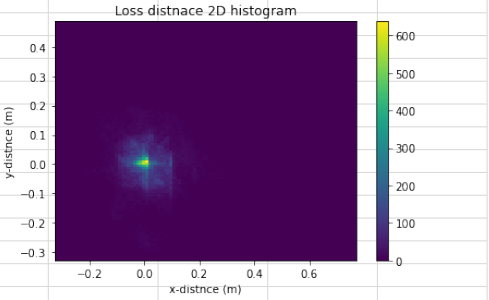


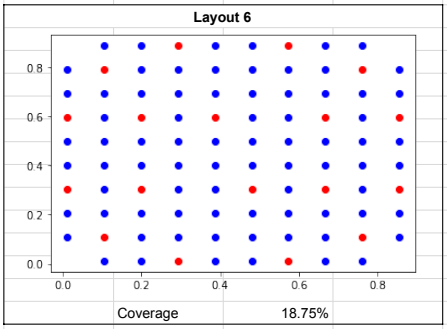




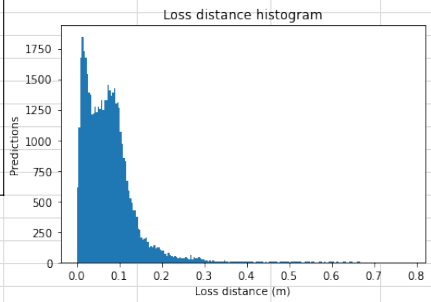
Data type	MSE	Ave error (m)	Max error (m)	Accuracy
Float32	9.82E-03	7.79E-02	8.21E-01	90.15%
Int8	9.77E-03	7.78E-02	8.19E-01	90.14%
Float6 (E4M1)	9.38E-03	7.65E-02	8.21E-01	90.81%
Int8 (regularization)	9.46E-03	7.70E-02	8.21E-01	90.64%

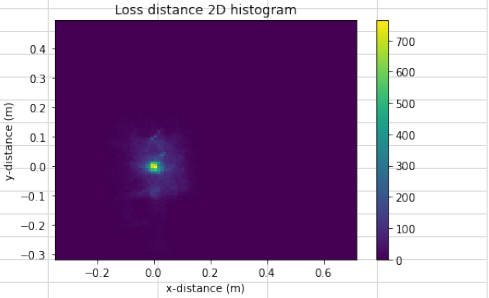


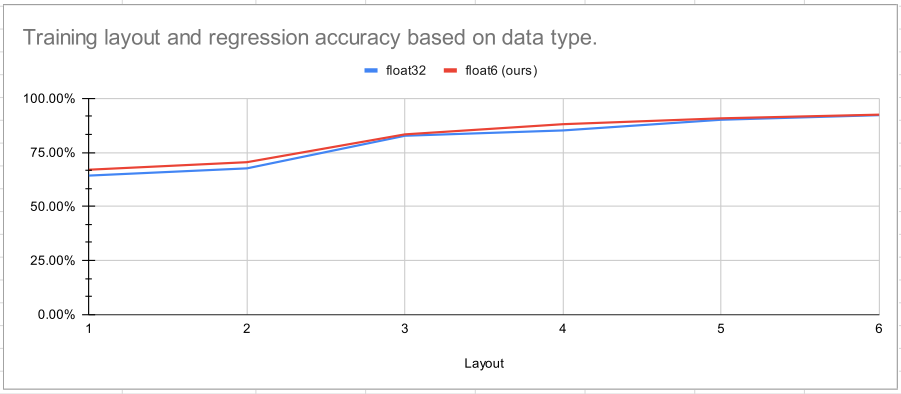




Data type	MSE	Ave error (m)	Max error (m)	Accuracy
Float32	9.00E-03	7.30E-02	8.24E-01	92.28%
Int8	9.08E-03	7.38E-02	8.29E-01	92.21%
Float6 (E4M1)	9.47E-03	7.42E-02	8.68E-01	92.51%
Int8 (regularization)	9.45E-03	7.43E-02	8.63E-01	92.54%





Training layout and regression accuracy based on data type.

		Data type	
Layout	**Coverage**	**float32**	**float6 (ours)**
1	8.33%	64.30%	67.02%
2	8.33%	67.65%	70.50%
3	12.50%	82.75%	83.39%
4	12.50%	85.21%	88.10%
5	16.67%	90.15%	90.81%
6	18.75%	92.28%	92.51%