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Applying Machine Learning for COP Data Filtering

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Hypothesis AI/ ML techniques for data filtering is more effective than traditional data filtering algorithms (e.g. Kalman Filters), resulting in improved performance in accuracy of target position estimation

Created a synthetic test range for measurement and analysis of ML **Result and** Contribution Integrated learning model as part of a standard KF algorithm to improve state estimation accuracy by approximately 20%.



Future Work

Generalisability Introduce temporal dependence modules in ANN (e.g. LSTM) of ANN **Explore reinforcement learning training regime to learn across**

Extension and expansion to mission sets

Multiple target categorisation and filtering with the aid of ANN

Inclusion of external environment factors (e.g. temperature, sea state) as part of training, so that the ANN is adaptable to factors that are not accounted in KF models

Reference:

Ullah, I., Fayaz, M., Naveed, N., & Kim, D. (2020). ANN based learning to Kalman filter algorithm for indoor environment prediction in smart greenhouse. IEEE Access, 8, 159371–159388. https://doi.org/10.1109/ACCESS.2020.3016277

Matrix Games. (2022b). Command: Modern operations (1.04.114745) [Windows]. https://www.matrixgames.com/game/command-modern-operations Liaw, R., Liang, E., Nishihara, R., Moritz, P., Gonzalez, J. E., & Stoica, I. (2018). Tune: A research platform for distributed model selection and training. ArXiv Preprint ArXiv:1807.05118.

