

5 Conclusion

This paper discusses a Least-squares Support Vector Machine (LS-SVM) learning framework that can be deployed near the sensor on the extreme edge. Two different operating modes were examined, i.e. a fixed-model architecture and an adaptive-model architecture, employing a time-recursive learning strategy and were compared to an offline SVM solution acting as a baseline. The introduced framework was validated in the application of acoustic presence detection on 555 hours of real-life data collected in an office environment. The obtained results indicate that the fixed-model architecture operating mode achieves similar presence detection scores compared to the offline SVM solution. The adaptive-model architecture results on the other hand are slightly less accurate, but comes with the advantage that no initialisation is required. Future research will mainly focus on (i) further improving the adaptive-model architecture operating mode, (ii) the use of a multi-modal dataset to further improve the overall detection performance and (iii) the development of a real-life demonstrator embedded on a microcontroller (i.e. ARM Cortex M7).

References

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