

Supplementary Material

Continuous monitoring of propofol in human serum with fouling compensation by support vector classifier

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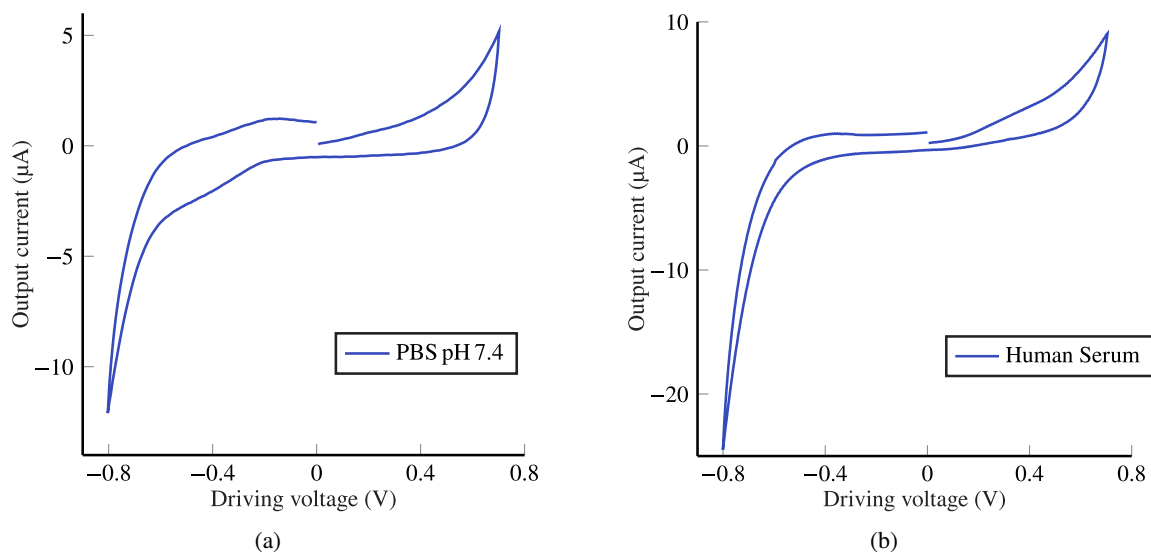


Figure S1: Voltammogram of our proposed sensor immersed in PBS pH 7.4 (a) and human serum (b). The only visible differences are present at the borders of the voltammogram, while near the location of the propofol peak there are not visible redox related to possible interfering molecules.

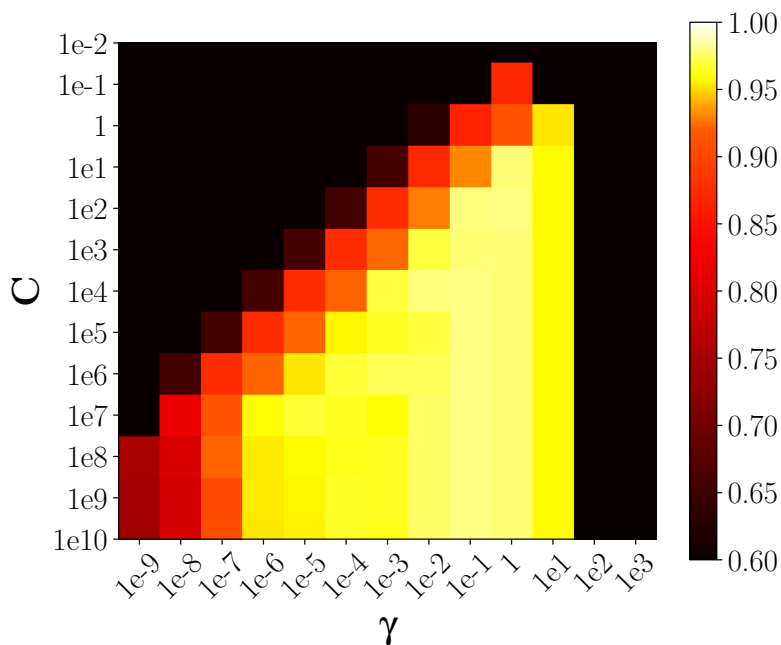


Figure S2: Heatmap of cross-validation accuracy as function of RBF-SVC hyper-parameters C and γ , highlighting the parameters space yielding the most accurate classifiers (yellow regions), $C = 100$ and $\gamma = 1$.

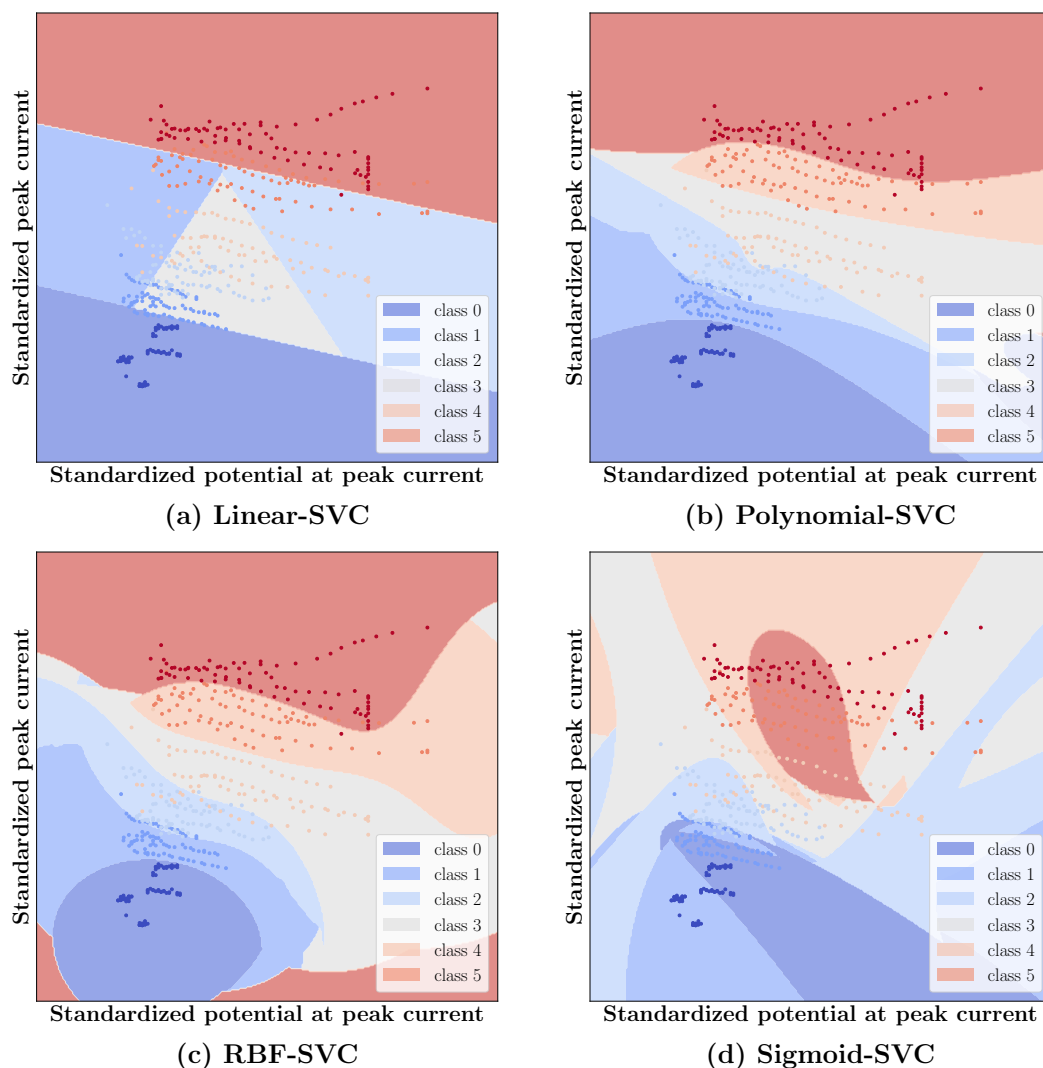


Figure S3: Kernelized-SVC implemented with: linear (a), polynomial (b), RBF (c), and sigmoid kernel (d), represented by the features space peak current and potential at peak current. The spaces are color-mapped according to the class predicted by the classifier, highlighting the decision boundaries and each sample is color-mapped to its target class in order to assess classification accuracy. It can be seen that the samples cannot be linearly separated in the original features space. The polynomial kernelized SVC presents graphically the best boundaries.

Table S1

Comparison of limit of detection with respect to the state-of-the-art. Considering this figure of merit, the proposed method trades off a slight increase in LOD with capability of continuous measurement.

Reference	LOD	Continous measurement*
Langmaier et al. (2011)	$3.2 \pm 0.1 \mu\text{M}$	no
Hong et al. (2016)	$0.1 \mu\text{g/ml}$ ($\approx 0.5 \mu\text{M}$)	no
Stradolini et al. (2018)	$2.4 \pm 0.5 \mu\text{M}$	no
This work	$4.9 \pm 1.3 \mu\text{M}$	yes

*Without human intervention.

References

- Hong, C.C., Lin, C.C., Hong, C.L., Lin, Z.X., Chung, M.H., Hsieh, P.W., 2016. *Biosens. Bioelectron.* 86, 623–629.
- Langmaier, J., Garay, F., Kivlehan, F., Chaum, E., Lindner, E., 2011. *Anal. Chim. Acta* 704, 63–67.
- Stradolini, F., Kilic, T., Taurino, I., De Micheli, G., Carrara, S., 2018. *Sens. Actuators B Chem.* 269, 304–313.