

# Online Kernel SVM

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- Implemented the LASVM algorithm of Bordes et al. (2005)
- Similar to their paper, but without the bias term
- Variant of Dual Coordinate Ascent
- Given a dual variable, fully minimize with respect to it
- No bias term means this can be done in closed form

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- Online algorithm: Receive new example, perform process and then reprocess a fixed number of times

# Convergence properties

- Guaranteed to converge to batch solution with enough reprocess steps and multiple passes over data
- Typically works quite well in just one pass and 1-2 reprocess steps
- Can use active learning for faster convergence

## Other implementation details

- Maximum change in one update capped at 1 for stability
- Cache of kernel evaluations for efficiency, *maxcache* parameter set to  $2^{30}$

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  - Polynomial: specified as `--kernel poly`. Additionally takes `--degree d` (default 2)
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- **Do not forget to specify regularization through `--l2`**