

## Sample file for CSE599s

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## 1 Introduction

This sample shows how to use the cse599s style file.

## 2 Notation

We will typically use the following notation. Don't worry if you don't know what these all mean yet.

symbol	meaning
$t \in \{1, \dots, T\}$	There are $T$ total rounds, and $t$ indexes the current round.
$w_t \in \mathbb{R}^n$	The feasible point selected by the algorithm on round $t$ .
$n \in \mathbb{N}^+$	The dimensionality of the feasible set of convex points.
$w_{t,i} \in \mathbb{R}$	The $i$ th coordinate of $w_t$ , with $i \in \{1, \dots, n\}$ .
$\mathcal{W} \subseteq \mathbb{R}^n$	A convex feasible set containing the possible $w_t$ .
$f_t : \mathcal{W} \rightarrow \mathbb{R}$	A convex loss function selected by the adversary on round $t$ .
$g_t \in \mathbb{R}^n$	The gradient of the current loss function at $w_t$ , so $g_t = \nabla f_t(w_t)$ .
$r : \mathcal{W} \rightarrow \mathbb{R}$	A strongly convex regularization function.
$(x_t, y_t)$	Feature vector $x$ (usually in $\mathbb{R}^n$ ), and label $y \in \mathbb{R}$
$h \in \mathcal{H}$	Hypothesis $h$ from the set of possible hypotheses $\mathcal{H}$ .
$\hat{y}_t$	Predicted label for $x_t$ , for example $\hat{y}_t = h(x_t)$ .

## 3 Online learning is fun

Yes it is (see for example [1])

**Theorem 1.** *My algorithm works.*

*Proof.* I have proof. □

## References

- [1] N. Cesa-Bianchi and G. Lugosi, "Prediction, Learning, and Games", *Cambridge University Press*, 2006.