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# Bandit networks

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## Abstract

A single-agent multi-armed bandit (MAB) problem is a problem in which a gambler, being in face of several slot machines, has to decide which machines to play, how many times and in which order to play each machine. In this project, we consider a multi-agent MAB scenario in which a group of agents connected through a social network are engaged in playing a stochastic MAB game and focus on minimizing their regret. Every time a player takes an action, the reward is observed by both the agent and its neighbors in the network. The goal of this project is to understand different collaborative policies (NAIC-type and FYL) described in [1], and to compare their performance over different network structures.

## 1 Introduction

## 2 ...

## 3 Theoretical contributions

## 4 Experimental results

### 4.1 Reproducing experiments from [1]

### 4.2 Distributed star network

## 5 Conclusion

## References

- [1] Ravi Kumar Kolla, Krishna P. Jagannathan, and Aditya Gopalan. Stochastic bandits on a social network: Collaborative learning with local information sharing. *CoRR*, abs/1602.08886, 2016.

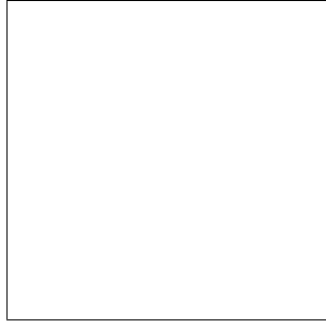


Figure 1: Sample figure caption.

## 6 Citations, figures, tables, references

These instructions apply to everyone.

### 6.1 Citations within the text

The `natbib` package will be loaded for you by default. Citations may be author/year or numeric, as long as you maintain internal consistency. As to the format of the references themselves, any style is acceptable as long as it is used consistently.

The documentation for `natbib` may be found at

<http://mirrors.ctan.org/macros/latex/contrib/natbib/natnotes.pdf>

Of note is the command `\citet`, which produces citations appropriate for use in inline text. For example,

```
\citet{hasselmo} investigated\dots
```

produces

Hasselmo, et al. (1995) investigated...

If you wish to load the `natbib` package with options, you may add the following before loading the `neurips_2018` package:

```
\PassOptionsToPackage{options}{natbib}
```

If `natbib` clashes with another package you load, you can add the optional argument `nonatbib` when loading the style file:

```
\usepackage[nonatbib]{neurips_2018}
```

As submission is double blind, refer to your own published work in the third person. That is, use “In the previous work of Jones et al. [4],” not “In our previous work [4].” If you cite your other papers that are not widely available (e.g., a journal paper under review), use anonymous author names in the citation, e.g., an author of the form “A. Anonymous.”

### 6.2 Figures

All artwork must be neat, clean, and legible. Lines should be dark enough for purposes of reproduction. The figure number and caption always appear after the figure. Place one line space before the figure caption and one line space after the figure. The figure caption should be lower case (except for first word and proper nouns); figures are numbered consecutively.

You may use color figures. However, it is best for the figure captions and the paper body to be legible if the paper is printed in either black/white or in color.

Table 1: Sample table title

Part		
Name	Description	Size ( $\mu\text{m}$ )
Dendrite	Input terminal	$\sim 100$
Axon	Output terminal	$\sim 10$
Soma	Cell body	up to $10^6$

### 6.3 Tables

All tables must be centered, neat, clean and legible. The table number and title always appear before the table. See Table 1.

Place one line space before the table title, one line space after the table title, and one line space after the table. The table title must be lower case (except for first word and proper nouns); tables are numbered consecutively.

Note that publication-quality tables *do not contain vertical rules*. We strongly suggest the use of the booktabs package, which allows for typesetting high-quality, professional tables:

<https://www.ctan.org/pkg/booktabs>

This package was used to typeset Table 1.