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# Assignment 1 - Defining & Solving RL Environments

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Affiliation

Address

email

## Abstract

1       The abstract paragraph should be indented  $\frac{1}{2}$  inch (3 picas) on both the left-  
2       and right-hand margins. Use 10 point type, with a vertical spacing (leading) of  
3       11 points. The word **Abstract** must be centered, bold, and in point size 12. Two  
4       line spaces precede the abstract. The abstract must be limited to one paragraph.

## 5   1   Submission of papers to NeurIPS 2020

6   NeurIPS requires electronic submissions. The electronic submission site is

7                       <https://cmt3.research.microsoft.com/NeurIPS2020/>

8   Please read the instructions below carefully and follow them faithfully.

### 9   1.1   Style

10   Papers to be submitted to NeurIPS 2020 must be prepared according to the instructions presented  
11   here. Papers may only be up to eight pages long, including figures. Additional pages *containing only*  
12   *a section on the broader impact, acknowledgments and/or cited references* are allowed. Papers that  
13   exceed eight pages of content will not be reviewed, or in any other way considered for presentation  
14   at the conference.

15   The margins in 2020 are the same as those in 2007, which allow for  $\sim 15\%$  more words in the paper  
16   compared to earlier years.

17   Authors are required to use the NeurIPS L<sup>A</sup>T<sub>E</sub>X style files obtainable at the NeurIPS website as  
18   indicated below. Please make sure you use the current files and not previous versions. Tweaking the  
19   style files may be grounds for rejection.

### 20   1.2   Retrieval of style files

21   The style files for NeurIPS and other conference information are available on the World Wide Web  
22   at

23                       <http://www.neurips.cc/>

24   The file `neurips_2020.pdf` contains these instructions and illustrates the various formatting re-  
25   quirements your NeurIPS paper must satisfy.

26   The only supported style file for NeurIPS 2020 is `neurips_2020.sty`, rewritten for L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub>. **Pre-**  
27   **vious style files for L<sup>A</sup>T<sub>E</sub>X 2.09, Microsoft Word, and RTF are no longer supported!**

28 The L<sup>A</sup>T<sub>E</sub>X style file contains three optional arguments: `final`, which creates a camera-ready copy,  
29 `preprint`, which creates a preprint for submission to, e.g., arXiv, and `nonatbib`, which will not  
30 load the `natbib` package for you in case of package clash.

31 **Preprint option** If you wish to post a preprint of your work online, e.g., on arXiv, using the  
32 NeurIPS style, please use the `preprint` option. This will create a nonanonymized version of your  
33 work with the text “Preprint. Work in progress.” in the footer. This version may be distributed as  
34 you see fit. Please **do not** use the `final` option, which should **only** be used for papers accepted to  
35 NeurIPS.

36 At submission time, please omit the `final` and `preprint` options. This will anonymize your sub-  
37 mission and add line numbers to aid review. Please do *not* refer to these line numbers in your paper  
38 as they will be removed during generation of camera-ready copies.

39 The file `neurips_2020.tex` may be used as a “shell” for writing your paper. All you have to do is  
40 replace the author, title, abstract, and text of the paper with your own.

41 The formatting instructions contained in these style files are summarized in Sections 2, 3, and 4  
42 below.

## 43 2 General formatting instructions

44 The text must be confined within a rectangle 5.5 inches (33 picas) wide and 9 inches (54 picas) long.  
45 The left margin is 1.5 inch (9 picas). Use 10 point type with a vertical spacing (leading) of 11 points.  
46 Times New Roman is the preferred typeface throughout, and will be selected for you by default.  
47 Paragraphs are separated by 1/2 line space (5.5 points), with no indentation.

48 The paper title should be 17 point, initial caps/lower case, bold, centered between two horizontal  
49 rules. The top rule should be 4 points thick and the bottom rule should be 1 point thick. Allow  
50 1/4 inch space above and below the title to rules. All pages should start at 1 inch (6 picas) from the  
51 top of the page.

52 For the final version, authors’ names are set in boldface, and each name is centered above the corre-  
53 sponding address. The lead author’s name is to be listed first (left-most), and the co-authors’ names  
54 (if different address) are set to follow. If there is only one co-author, list both author and co-author  
55 side by side.

56 Please pay special attention to the instructions in Section 4 regarding figures, tables, acknowledg-  
57 ments, and references.

## 58 3 Headings: first level

59 All headings should be lower case (except for first word and proper nouns), flush left, and bold.

60 First-level headings should be in 12-point type.

### 61 3.1 Headings: second level

62 Second-level headings should be in 10-point type.

#### 63 3.1.1 Headings: third level

64 Third-level headings should be in 10-point type.

65 **Paragraphs** There is also a `\paragraph` command available, which sets the heading in bold, flush  
66 left, and inline with the text, with the heading followed by 1 em of space.

## 67 4 Citations, figures, tables, references

68 These instructions apply to everyone.

### 69 4.1 Citations within the text

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

73 The documentation for natbib may be found at

74 `http://mirrors.ctan.org/macros/latex/contrib/natbib/natnotes.pdf`

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

77 `\citet{hasselmo}` investigated\dots

78 produces

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

80 If you wish to load the natbib package with options, you may add the following before loading the  
81 `neurips_2020` package:

82 `\PassOptionsToPackage{options}{natbib}`

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

85 `\usepackage[nonatbib]{neurips_2020}`

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

### 90 4.2 Footnotes

91 Footnotes should be used sparingly. If you do require a footnote, indicate footnotes with a number<sup>1</sup>  
92 in the text. Place the footnotes at the bottom of the page on which they appear. Precede the footnote  
93 with a horizontal rule of 2 inches (12 picas).

94 Note that footnotes are properly typeset *after* punctuation marks.<sup>2</sup>

### 95 4.3 Figures

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

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

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<sup>1</sup>Sample of the first footnote.

<sup>2</sup>As in this example.

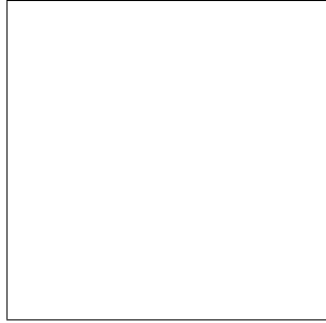


Figure 1: Sample figure caption.

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 $10^6$

## 4.4 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.

## 5 Final instructions

Do not change any aspects of the formatting parameters in the style files. In particular, do not modify the width or length of the rectangle the text should fit into, and do not change font sizes (except perhaps in the **References** section; see below). Please note that pages should be numbered.

## 6 Preparing PDF files

Please prepare submission files with paper size “US Letter,” and not, for example, “A4.”

Fonts were the main cause of problems in the past years. Your PDF file must only contain Type 1 or Embedded TrueType fonts. Here are a few instructions to achieve this.

- You should directly generate PDF files using `pdflatex`.
- You can check which fonts a PDF files uses. In Acrobat Reader, select the menu Files>Document Properties>Fonts and select Show All Fonts. You can also use the program `pdf fonts` which comes with `xpdf` and is available out-of-the-box on most Linux machines.

125 • The IEEE has recommendations for generating PDF files whose fonts are also ac-  
126 ceptable for NeurIPS. Please see [http://www.emfield.org/icuwb2010/downloads/](http://www.emfield.org/icuwb2010/downloads/IEEE-PDF-SpecV32.pdf)  
127 IEEE-PDF-SpecV32.pdf

128 • xfig "patterned" shapes are implemented with bitmap fonts. Use "solid" shapes instead.

129 • The `\bbold` package almost always uses bitmap fonts. You should use the equivalent AMS  
130 Fonts:

131 `\usepackage{amsfonts}`

132 followed by, e.g., `\mathbb{R}`, `\mathbb{N}`, or `\mathbb{C}` for  $\mathbb{R}$ ,  $\mathbb{N}$  or  $\mathbb{C}$ . You can also  
133 use the following workaround for reals, natural and complex:

134 `\newcommand{\RR}{I\!\!R} %real numbers`

135 `\newcommand{\Nat}{I\!\!N} %natural numbers`

136 `\newcommand{\CC}{I\!\!C} %complex numbers`

137 Note that `amsfonts` is automatically loaded by the `amssymb` package.

138 If your file contains type 3 fonts or non embedded TrueType fonts, we will ask you to fix it.

## 139 6.1 Margins in L<sup>A</sup>T<sub>E</sub>X

140 Most of the margin problems come from figures positioned by hand using `\special` or other com-  
141 mands. We suggest using the command `\includegraphics` from the `graphicx` package. Always  
142 specify the figure width as a multiple of the line width as in the example below:

143 `\usepackage[pdftex]{graphicx} ...`

144 `\includegraphics[width=0.8\linewidth]{myfile.pdf}`

145 See Section 4.4 in the graphics bundle documentation ([http://mirrors.ctan.org/macros/](http://mirrors.ctan.org/macros/latex/required/graphics/grfguide.pdf)  
146 [latex/required/graphics/grfguide.pdf](http://mirrors.ctan.org/macros/latex/required/graphics/grfguide.pdf))

147 A number of width problems arise when L<sup>A</sup>T<sub>E</sub>X cannot properly hyphenate a line. Please give LaTeX  
148 hyphenation hints using the `\-` command when necessary.

## 149 Broader Impact

150 Authors are required to include a statement of the broader impact of their work, including its ethical  
151 aspects and future societal consequences. Authors should discuss both positive and negative out-  
152 comes, if any. For instance, authors should discuss a) who may benefit from this research, b) who  
153 may be put at disadvantage from this research, c) what are the consequences of failure of the system,  
154 and d) whether the task/method leverages biases in the data. If authors believe this is not applicable  
155 to them, authors can simply state this.

156 Use unnumbered first level headings for this section, which should go at the end of the paper. **Note**  
157 **that this section does not count towards the eight pages of content that are allowed.**

## 158 References

159 References follow the acknowledgments. Use unnumbered first-level heading for the references.  
160 Any choice of citation style is acceptable as long as you are consistent. It is permissible to reduce  
161 the font size to `small` (9 point) when listing the references. **Note that the Reference section does**  
162 **not count towards the eight pages of content that are allowed.**

163 [1] Alexander, J.A. & Mozer, M.C. (1995) Template-based algorithms for connectionist rule extraction. In  
164 G. Tesauero, D.S. Touretzky and T.K. Leen (eds.), *Advances in Neural Information Processing Systems 7*, pp.  
165 609–616. Cambridge, MA: MIT Press.

- 166 [2] Bower, J.M. & Beeman, D. (1995) *The Book of GENESIS: Exploring Realistic Neural Models with the*  
167 *GEneral NEural Simulation System*. New York: TELOS/Springer-Verlag.
- 168 [3] Hasselmo, M.E., Schnell, E. & Barkai, E. (1995) Dynamics of learning and recall at excitatory recurrent  
169 synapses and cholinergic modulation in rat hippocampal region CA3. *Journal of Neuroscience* **15**(7):5249-  
170 5262.