CODECHECK certificate 2020-004

Item	Value
Title	Neuronlike adaptive elements that can solve difficult learning control problems
Authors	Andrew G. Barto, Richard S. Sutton, C. W. Anderson
Reference	https://doi.org/10.1109/TSMC.1983.6313077
Codechecker	Daniel Nüst
Date of check	2020-05-14 16:00:00
Summary	The check was relatively easy to do because the Python code was simple, but the documentation was not good. Computations took about 6 minutes to run.
Repository	https://github.com/codecheckers/Barto-Sutton-Anderson-1983

Table 1: CODECHECK summary

output	comment	size
python code/output/fig4.pdf	Figure 4 in the paper with simulation results	9173
python code/output/fig5.pdf	Figure 5 in the paper with simulation results	13052

Table 2: Summary of output files generated

Summary

The check was successful, without larger issues. The runtime environment was not specified at all but could be derived. The created graphs match the ones provided by the authors. However, these figures not perfectly resemble the ones from the original paper.

How to cite this report

```
Daniel Nüst. (2020, May 14). CODECHECK certificate 2020-004. Zenodo.
http://doi.org/10.5281/zenodo.3827371
```

CODECHECKER notes

The github repo contained all the necessary code. The test code was written in Python and there was a `Makefile`. I did not take a look at the C code at all.

I used a virtual environment to run the Python code, using Python 3 because of the sheband in `main.py`. I created `codecheck/requirements.txt` with trial and error to identify the required libraries.

Run the following code in a command line, then render this document (see `codecheck/Makefile`). The rendering copies the generated files to the CODECHECK directory.

```
#mkvirtualenv --python=$(which python3) barto-sutton-anderson-1983

cd python\ code
mv output/ output.backup
mkdir output

make

cd ../codecheck/
make clean codecheck.pdf
```

This took about 6 minutes on my laptop computer (8 cores, 40GB RAM).

Note that `python code/Makefile` does only mention one output file, but the script actually generates both.

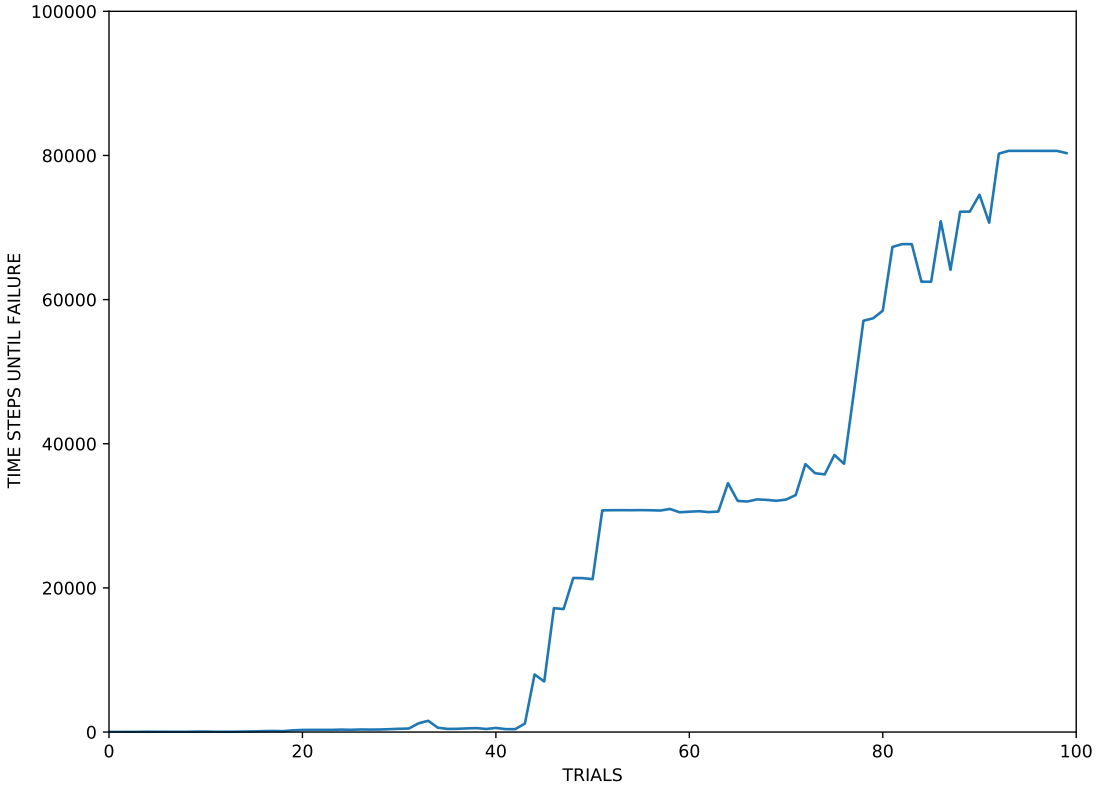

Figure 1: Figure 4 in the paper with simulation results

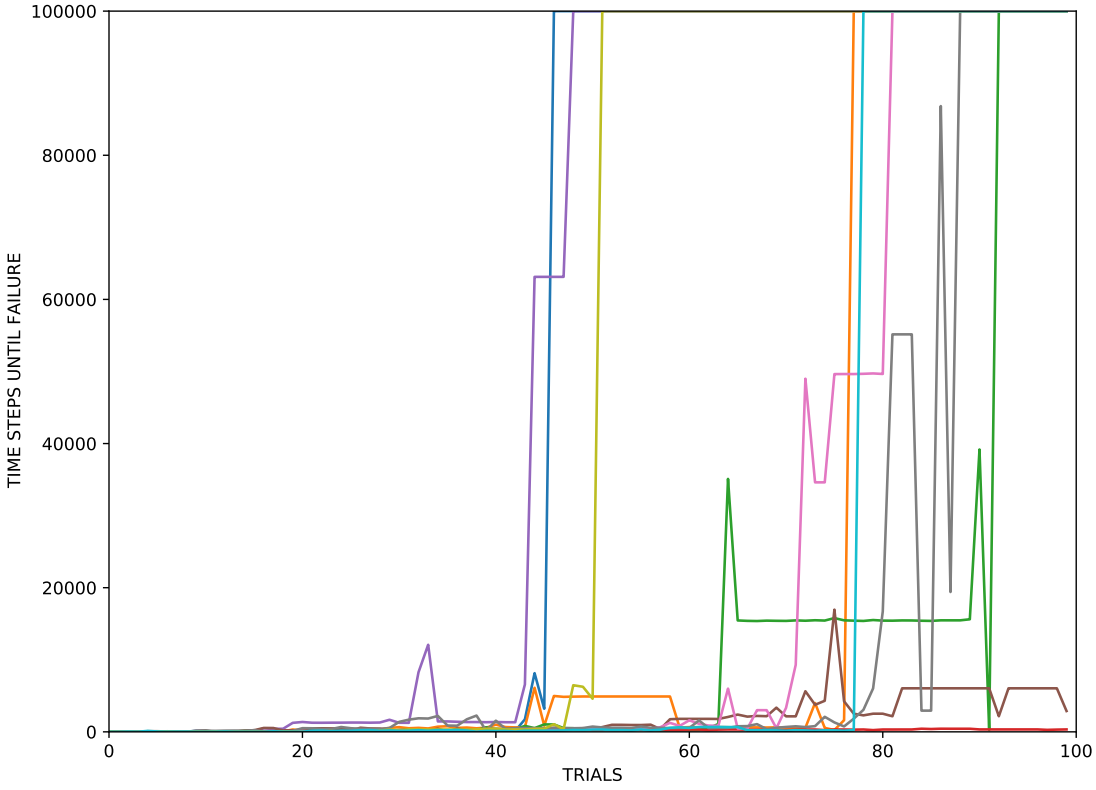

Figure 2: Figure 5 in the paper with simulation results

About this document

This document was created using R Markdown using the `codecheck` R package. `make codecheck.pdf` will regenerate the file.

```
sessionInfo()
```

```
## R version 3.6.2 (2019-12-12)
## Platform: x86_64-pc-linux-gnu (64-bit)
## Running under: Ubuntu 19.10
##
## Matrix products: default
## BLAS:   /usr/lib/x86_64-linux-gnu/openblas/libblas.so.3
## LAPACK: /usr/lib/x86_64-linux-gnu/libopenblasp-r0.3.7.so
##
## locale:
##  [1] LC_CTYPE=en_US.UTF-8       LC_NUMERIC=C
##  [3] LC_TIME=de_DE.UTF-8        LC_COLLATE=en_US.UTF-8
##  [5] LC_MONETARY=de_DE.UTF-8    LC_MESSAGES=en_US.UTF-8
##  [7] LC_PAPER=de_DE.UTF-8       LC_NAME=C
##  [9] LC_ADDRESS=C               LC_TELEPHONE=C
## [11] LC_MEASUREMENT=de_DE.UTF-8 LC_IDENTIFICATION=C
##
## attached base packages:
## [1] stats     graphics  grDevices utils     datasets
## [6] methods   base
##
## other attached packages:
## [1] readr_1.3.1          tibble_3.0.1
## [3] rprojroot_1.3-2      knitr_1.28
## [5] codecheck_0.0.0.9000 stringr_1.4.0
## [7] yaml_2.2.1           xtable_1.8-4
## [9] zen4R_0.3-1
##
## loaded via a namespace (and not attached):
##  [1] Rcpp_1.0.4.6    xml2_1.3.2      magrittr_1.5
##  [4] hms_0.5.3       rvest_0.3.5     R6_2.4.1
##  [7] rlang_0.4.6     highr_0.8       httr_1.4.1
## [10] tools_3.6.2     xfun_0.13       htmltools_0.4.0
## [13] ellipsis_0.3.0  digest_0.6.25   lifecycle_0.2.0
## [16] crayon_1.3.4    vctrs_0.3.0     evaluate_0.14
## [19] rmarkdown_2.1   stringi_1.4.6   compiler_3.6.2
## [22] pillar_1.4.4    backports_1.1.7 jsonlite_1.6.1
## [25] pkgconfig_2.0.3
```