

CODECHECK certificate 2020-003

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Check time: 2020-04-06



Prerequisites

I'm starting this code check at revision `bc206776feb05765d9844dbf90bcf4877d652a13` of the git repository <https://github.com/codecheckers/Hopfield-1982>. There is no repository created by the author; the code was compiled from publicly available resources by Yuhao Wang, with some adjustments by me to closer match the styling of the created figures.

- `README` file exists
- `LICENSE` file exists
- `codecheck.yml` with manifest, seems to be valid on manual inspection.

The CODECHECK

This report checks the code of the article *Neural networks and physical systems with emergent collective computational abilities* (<https://doi.org/10.1073/pnas.79.8.2554>). See section Notes for details about running the code.

The CODECHECK was successful. The created figure `Fig 2.pdf` is visually very close to the one in the paper. The same patterns in the data are there. The differences in the numbers could stem from computing artefacts.

The reproduction of the figure from the manuscript was pretty straightforward based on the file `Hopfield-1982.py` despite the very minimal `README.md`. Since I am not familiar with the used software stack, it required some back and forth to identify the required Python libraries. The code only runs a couple of minutes on my machine.

Codechecker notes

The workflow in the directory `code/` was tested with Python 3.7 in a virtual environment created with `mkvirtualenv --python $(which python3) hopfield`. The environment was exported to `requirements.txt` and can now be recreated from that file. The following commands create and prepare the environment.

```
cd codecheck
mkvirtualenv --python $(which python3) hopfield
pip install -r requirements.txt
```

Then, we can use the Makefile to run copy the input files to this directory and run the workflow.

```
cd codecheck
make codecheck
```

The used machine:

Kernel:

Linux nuest 5.3.0-45-generic #37-Ubuntu SMP Thu Mar 26 20:41:27 UTC 2020 x86_64 x86_64 x86_64 GNU/Linux

Distro:

No LSB modules are available.

Distributor ID: Ubuntu

Description: Ubuntu 19.10

Release: 19.10

Codename: eoan

Python:

Python 3.7.6

The following files are uploaded to a deposit on Zenodo from the directory `codecheck/` in the repository:

```
## [1] "codecheck.pdf"      "codecheck.Rmd"      "codecheck.tex"      "Fig 2.pdf"
## [5] "Makefile"            "requirements.txt"
```

Here are the original figure from the directory `code/` and the reproduced figure from the directory `codecheck/`:

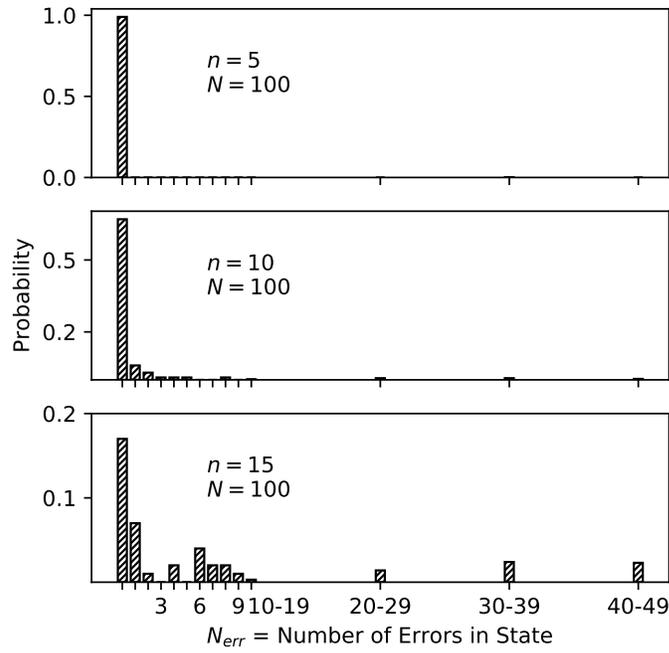


Figure 1: Original figure

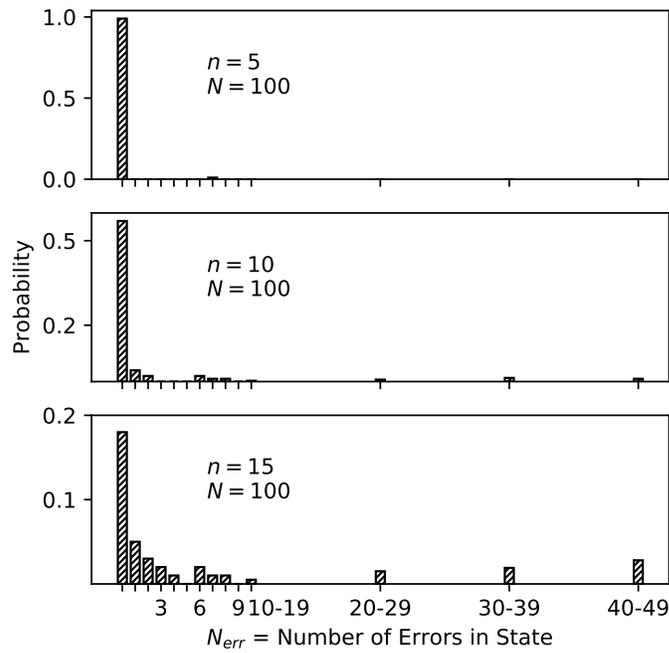


Figure 2: Original figure