

CODECHECK certificate 2024-003

<https://doi.org/10.5281/zenodo.11403956>






Item	Value
Title	State-Dependent Dynamic Tube MPC: A Novel Tube MPC Method with a Fuzzy Model of Disturbances
Authors	Filip Surma  , Anahita Jamshidnejad 
Reference	https://arxiv.org/pdf/2310.19997
Codechecker	Stephen J. Eglen  , Delft 2024-05 participants
Date of check	2024-05-30 11:30:00
Summary	Matlab code, requiring 3 additional toolboxes. Case study 2 only. Full reproduction possible, takes about 2 hours to run
Repository	https://github.com/codecheckers/sddtmpc

Table 1: CODECHECK summary

Output	Comment	Size (b)
fig1.png	manuscript Figure 11	42357
fig2.png	(not included in manuscript)	38057
fig3.png	manuscript Figure 12 (orange curve only)	25218
fig4.png	manuscript Figure 13	29283
fig5.png	manuscript Figure 14	37977
fig6.png	manuscript Figure 15	31918
fig7.png	manuscript Figure 16	29730

Table 2: Summary of output files generated

Summary

This project was straightforward to reproduce. The key requirements were clearly stated, with the only additional requirement being the Control Systems toolbox that was not mentioned in the repository.

The computation time was approximately 2 hours.

CODECHECKER notes

Before running the code, I needed to install three toolboxes (two of which were already noted in the author's readme): optimization, global optimization, and control systems. These were installed using the 'Add ons' tool-bar item from from the top of the Matlab GUI.

The repository already contained a folder called Figures which contained matlab fig and png files. I renamed this folder to Figures-safe in case when I ran the code these figures would be overwritten, and created a new Figures folder. (They were not however overwritten).

The steps were to simply start matlab in the root folder and type 'main' at the prompt. The code took 2 hours on a modern mac laptop to complete.

Figures 1 through 7 then appeared on the screen and I saved them as PNGs, and then quit Matlab. The author's repository stated that only case study 2 (2nd half of paper) was to be tested.

After finding the correspondence (during a workshop session) between the Figures generated and the manuscript, I started to write the codecheck.yml file and the report.

As the code was not on github, I simply deleted the .git folder and created a new repository on github called codecheckers/sddtp.

Recommendations

I suggest to the authors to consider the following suggestions for their next publication or workflow:

- You could save figures automatically to a folder, and give them semantically meaningful names.
- State how long the computation takes on a modern day laptop.
- State which figures in the manuscript correspond to outputs run by the code.

Manifest files

fig1.png

Comment: manuscript Figure 11

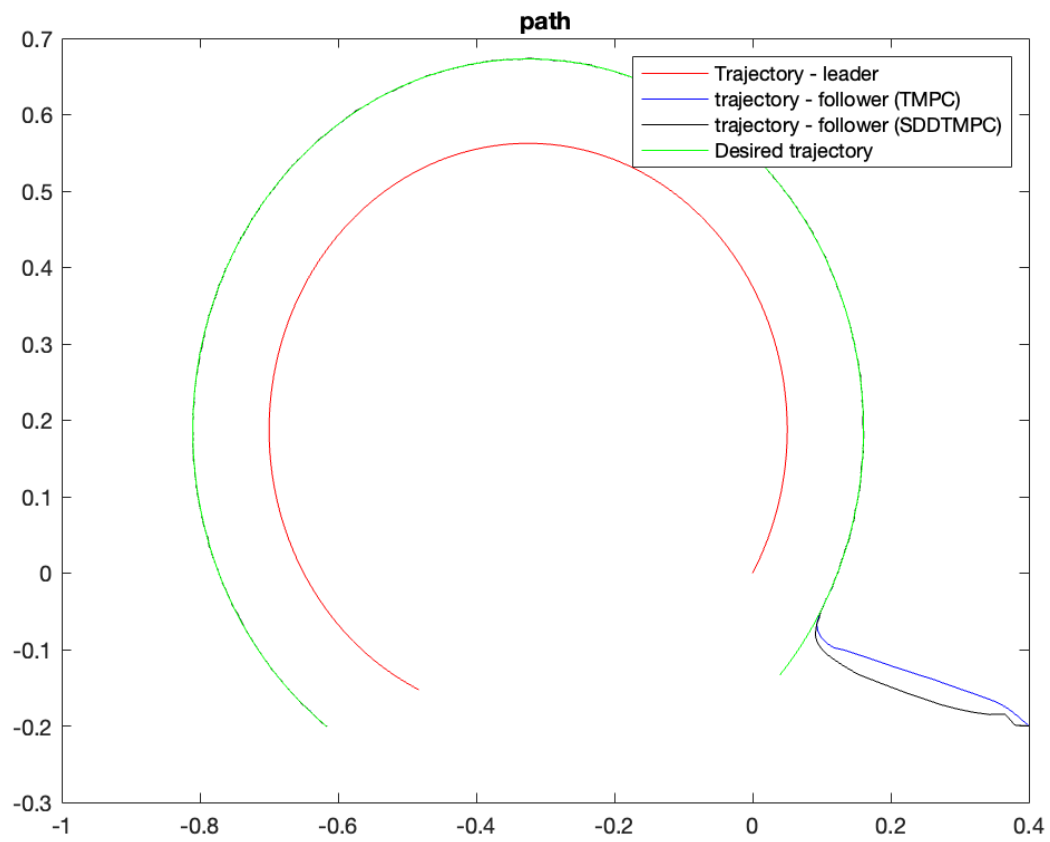


fig2.png

Comment: (not included in manuscript)

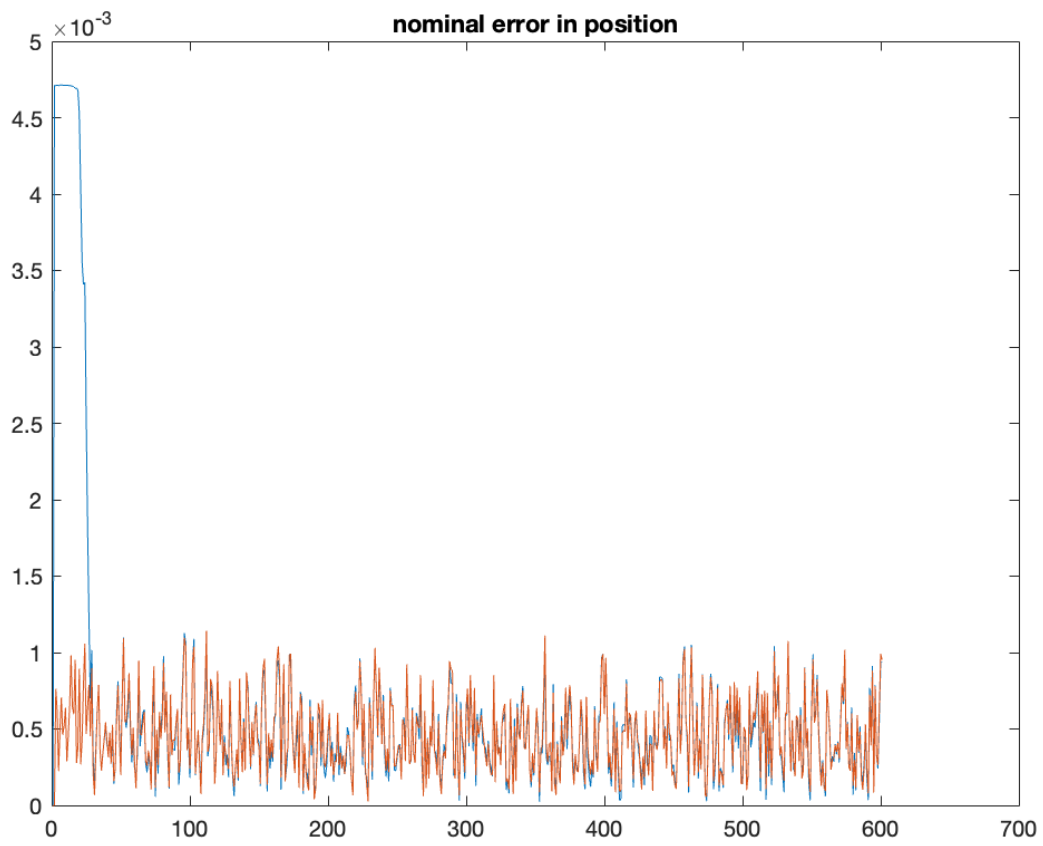


fig3.png

Comment: manuscript Figure 12 (orange curve only)

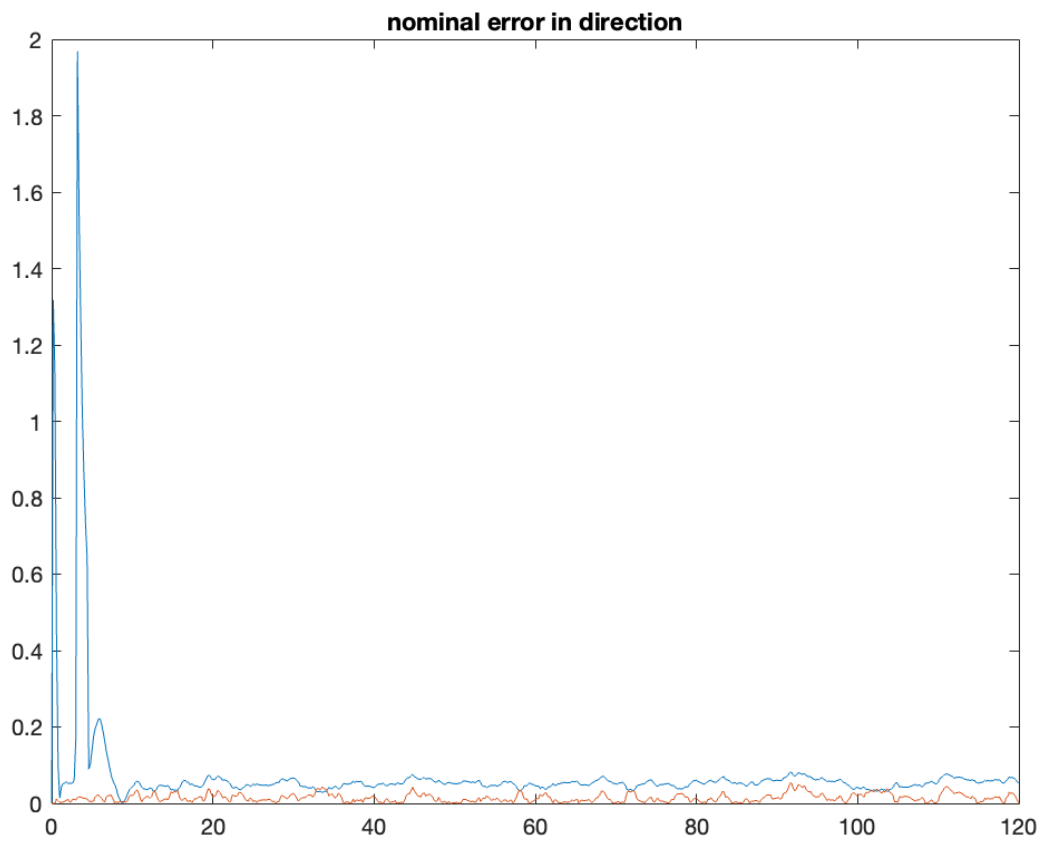


fig4.png

Comment: manuscript Figure 13

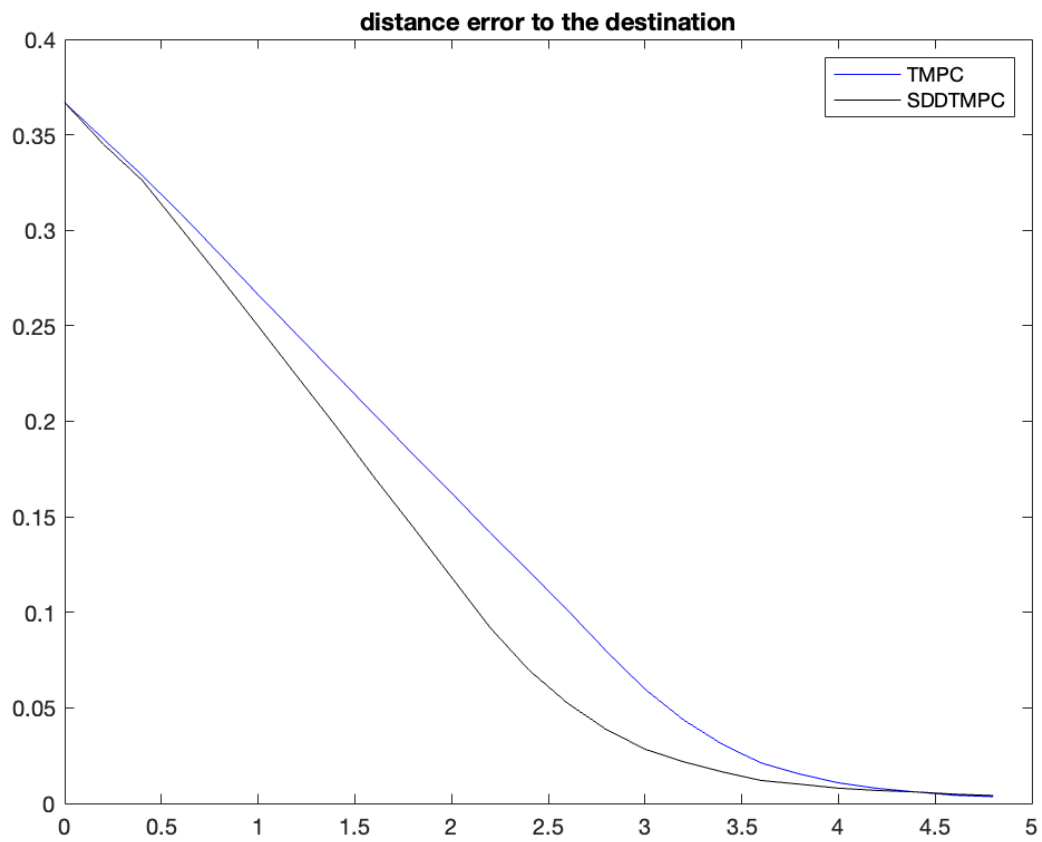


fig5.png

Comment: manuscript Figure 14

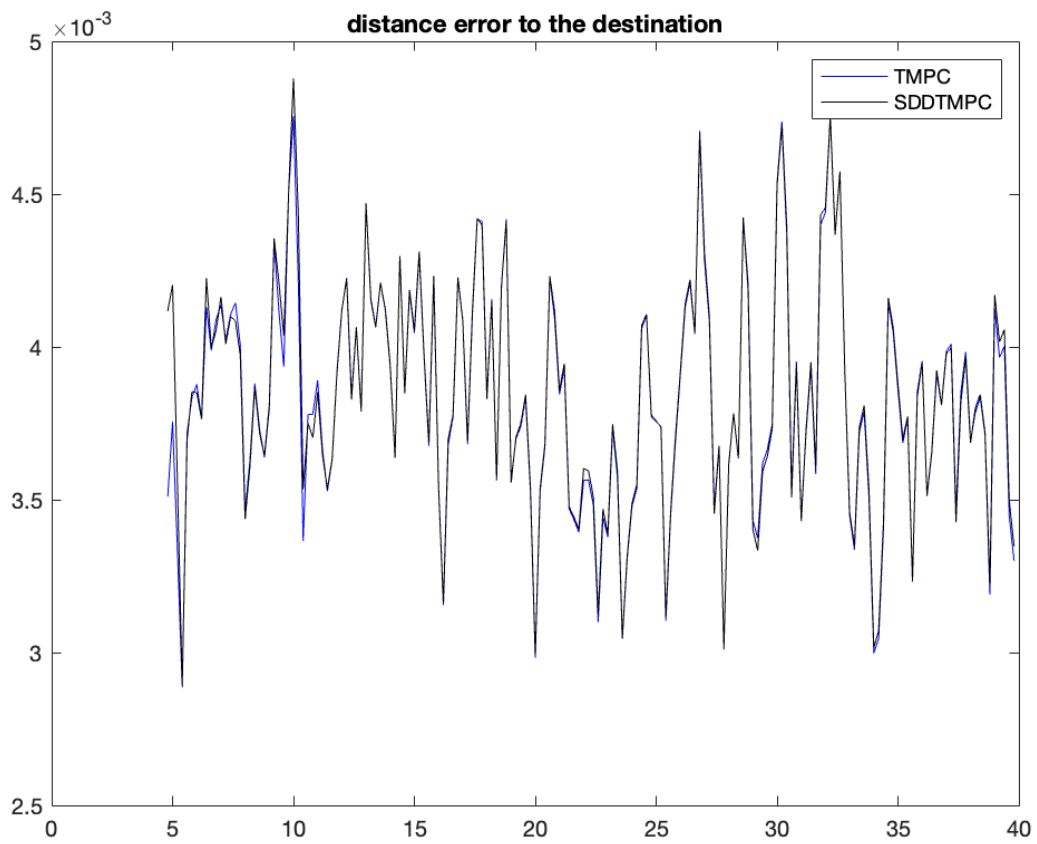


fig6.png

Comment: manuscript Figure 15

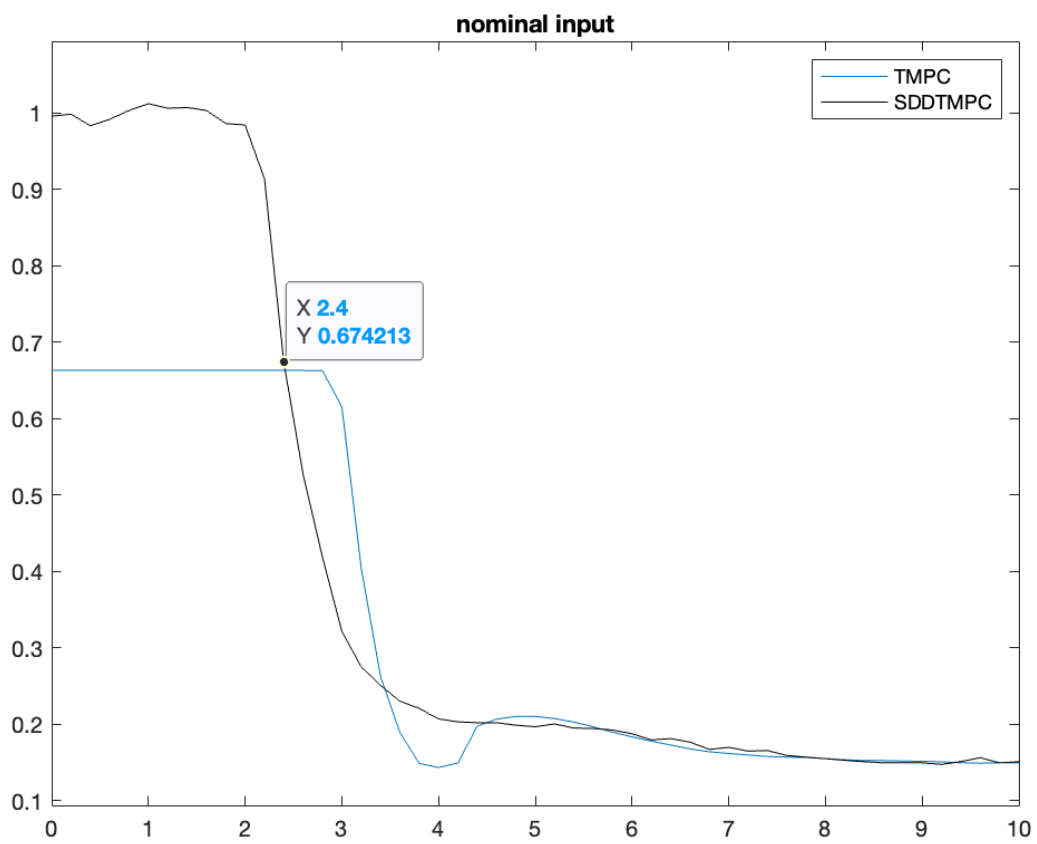
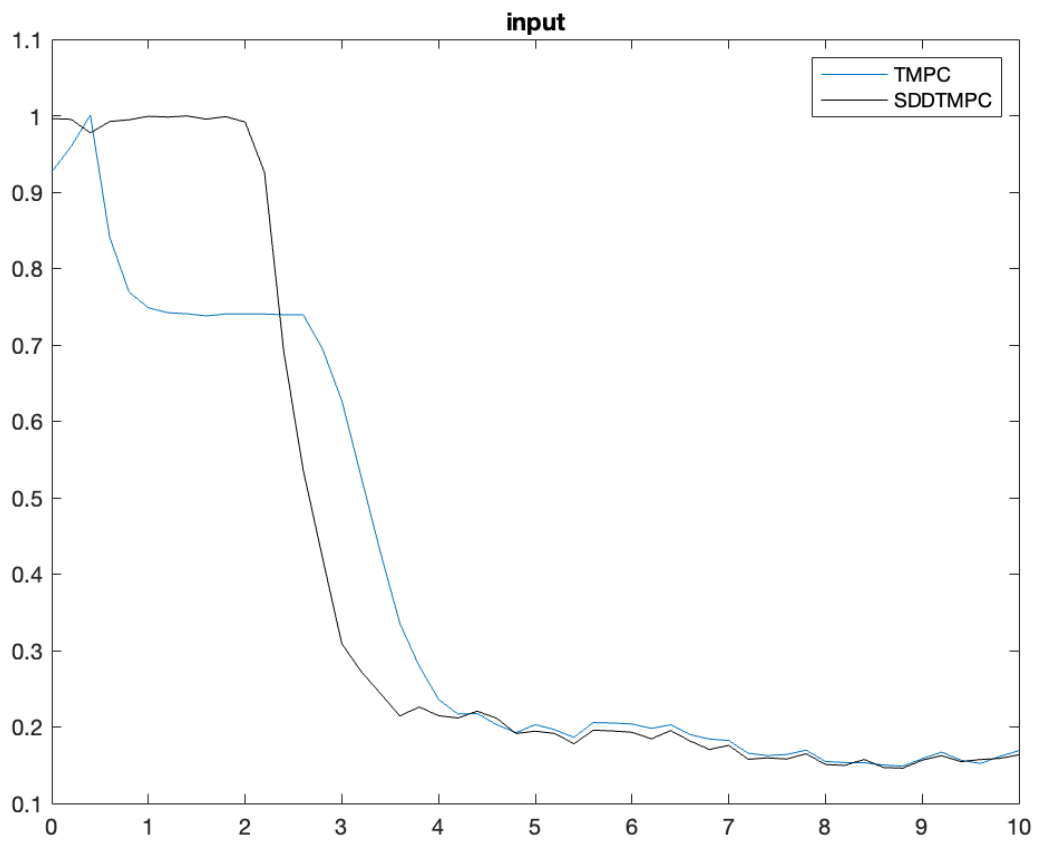


fig7.png

Comment: manuscript Figure 16



Acknowledgements

This codecheck was created collaboratively as part of the May 2024 workshop in Delft. The author (Filip Sharma) was in the audience and helped answer questions about his work. The workshop participants also collectively helped by determining how the figures generated by the matlab corresponded to figures in the manuscript. CODECHECK acknowledges financial supported from the Mozilla foundation and the Dutch Research Council, NWO.

Citing this document

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About CODECHECK

This certificate confirms that the codechecker could independently reproduce the results of a computational analysis given the data and code from a third party. A CODECHECK does not check whether the original computation analysis is correct. However, as all materials required for the reproduction are freely available by following the links in this document, the reader can then study for themselves the code and data.

About this document

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

```
sessionInfo()
```

```
## R version 4.3.3 (2024-02-29)
## Platform: aarch64-apple-darwin23.2.0 (64-bit)
## Running under: macOS Sonoma 14.5
##
## Matrix products: default
## BLAS: /opt/homebrew/Cellar/openblas/0.3.27/lib/libopenblas-r0.3.27.dylib
## LAPACK: /opt/homebrew/Cellar/r/4.3.3/lib/R/lib/libRlapack.dylib; LAPACK version 3.11.0
##
## locale:
## [1] en_GB.UTF-8/en_GB.UTF-8/en_GB.UTF-8/C/en_GB.UTF-8/en_GB.UTF-8
##
## time zone: Europe/London
## tzcode source: internal
##
## attached base packages:
## [1] stats      graphics  grDevices  utils      datasets
## [6] methods    base
##
## other attached packages:
## [1] readr_2.1.5      tibble_3.2.1
## [3] xtable_1.8-4     yaml_2.3.8
## [5] rprojroot_2.0.4  knitr_1.47
## [7] codecheck_0.1.0.9006 parsedate_1.3.1
## [9] R.cache_0.16.0   gh_1.4.1
##
## loaded via a namespace (and not attached):
```

```

## [1] xfun_0.44          rdflib_0.2.8      tzdb_0.4.0
## [4] vctrs_0.6.5        tools_4.3.3       generics_0.1.3
## [7] curl_5.2.1         parallel_4.3.3    fansi_1.0.6
## [10] pkgconfig_2.0.3    R.oo_1.26.0       redland_1.0.17-18
## [13] assertthat_0.2.1   lifecycle_1.0.4   compiler_4.3.3
## [16] atom4R_0.3-3       stringr_1.5.1     keyring_1.3.2
## [19] htmltools_0.5.8.1 pillar_1.9.0      crayon_1.5.2
## [22] whisker_0.4.1      tidyr_1.3.1       R.utils_2.12.3
## [25] cachem_1.1.0       zen4R_0.10        tidyselect_1.2.1
## [28] zip_2.3.1          digest_0.6.35     stringi_1.8.4
## [31] dplyr_1.1.4        purrr_1.0.2       fastmap_1.2.0
## [34] cli_3.6.2          magrittr_2.0.3    XML_3.99-0.16.1
## [37] crul_1.4.2         utf8_1.2.4        osfr_0.2.9
## [40] withr_3.0.0        bit64_4.0.5       roxygen2_7.3.1
## [43] rmarkdown_2.27     httr_1.4.7        bit_4.0.5
## [46] R.methodsS3_1.8.2 hms_1.1.3         memoise_2.0.1
## [49] evaluate_0.23      rlang_1.1.3       Rcpp_1.0.12
## [52] glue_1.7.0         httpcode_0.3.0    xml2_1.3.6
## [55] fauxpas_0.5.2      rorcid_0.7.0      vroom_1.6.5
## [58] jsonlite_1.8.8     R6_2.5.1          plyr_1.8.9
## [61] fs_1.6.4

```