Compliance sheet — star-linefit

Everything a supplier qualification, a legal review or an export check usually asks about star-linefit 0.1.0, in one document.

1. Identity

Document	STAR-PKG-STAR-LINEFIT-EN · v2.3 · 2026-11-14
Package	star-linefit
Version	0.1.0
Capability	star.statistics.line-fit
Maturity	Released & Verified (RELEASED)
Python	>=3.9
Source commit	dc09f61d
Source	https://github.com/Andrea07072000/S.T.A.R.-/tree/main/packages/star_linefit

2. Licence and obligations

Apache License 2.0. You may use, copy, modify and distribute it, also commercially, and you receive a patent licence from the contributors. When you redistribute it: keep the LICENSE file and the copyright notices (and a NOTICE file, if a future version adds one), and state in modified files that you changed them. You may not use the S.T.A.R. name to endorse your product.

3. What it needs at run time

Nothing beyond the Python standard library: it works offline.

4. Integrity

SHA-256 fingerprints of the files published on this website. Check a downloaded file with:

```
python -c "import
hashlib,sys;print(hashlib.sha256(open(sys.argv[1],'rb').read()).hexdigest())" star_linefit-
0.1.0-py3-none-any.whl
```

FILE	SHA-256
star_linefit-0.1.0-py3-none-any.whl	6adff0bbf33fd37deab84d1e12269eb9f410da6c016b45d3e58e729ce972a130
star_linefit.py	74f3ffaddda01a38aec122396ea21385fdba4e451abb7a51e9a27d7df6da6533
star_linefit-0.1.0-source.zip	1413190e95a0b61fe03eb413a030dcad291eafb3761738f6172f877f36754d86

5. What it does, and its limits

Least-squares straight line, standard errors of slope and intercept, residual standard deviation and Pearson correlation computed exactly in rational arithmetic and rounded once; on 500 datasets all six results are identical to the exact rational value from SymPy; reproduces the five certified values of the NIST Norris dataset to 1e-13 relative.

An ordinary least-squares line with errors only in y, equal weights and no intercept constraint: no weighted fit, no errors in x, no polynomial or robust fit, no confidence intervals or tests. The standard errors assume independent residuals of equal variance, which this module cannot check. "Exact" refers to the floats supplied. Exact arithmetic is slower than floating point: it is for results that must not depend on rounding, not for large arrays.

- `fit(xs, ys)` returns (slope, intercept) of the line that minimises the sum of squared vertical residuals; `fit_errors` returns the standard errors of the two and the residual standard deviation (n - 2 degrees of freedom); `correlation` returns Pearson's r.
- Every result is the float nearest to the exact value of its formula applied to the numbers given, square roots included; it does not depend on the order of the points, and r is exactly ±1 only for points exactly on a line.
- Measured on 500 datasets of 3 to 40 points: all six results identical to the exact rational value (SymPy) rounded once. SciPy, NumPy and CPython's `statistics` agree within 1e-7 of the natural scale on the half of the corpus with x within ±10; on the half with x near 1e6 to 1e9 their own rounding reaches 4e-7. The NIST reference dataset Norris is reproduced to 1e-13 relative on its five certified values.

- Every function returns floats or raises `ValueError`: data that are not lists or tuples of 2 to 100000 finite numbers within 1e100, different lengths, all x equal, all y equal (correlation), fewer than 3 points (errors), a result too large for a float.

6. Export, use and certification

The package is published and freely available. That usually takes software out of export-control lists, but not every use of it: read the page on space activities and export control before using it in a controlled programme. It is not certified or qualified for flight; the evidence describes what was tested and how.

7. Citation and bill of materials

```
@software{cavazzini_star_linefit_0_1_0,
  author  = {Cavazzini, Andrea},
  title   = {{star-linefit}: Least-squares line and correlation, correctly rounded},
  version = {0.1.0},
  year    = {2026},
  url     = {https://andrea07072000.github.io/S.T.A.R.-/software/star_linefit/},
  note    = {Apache-2.0. Source: https://github.com/Andrea07072000/S.T.A.R.-, commit dc09f61d}
}
```

CITATION.cff · BibTeX · SBOM CycloneDX 1.5 · SBOM SPDX 2.3

8. Warranty and liability

Provided "as is", without warranties or conditions of any kind (Apache License 2.0, sections 7 and 8), to the extent the law allows. This never excludes liability that the law does not allow to exclude.

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