Research Software Engineering

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- Types of software

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- Publication economy

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- Software development practices

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- Publication economy
- Software development practices
- Problem / Solutions

Types of research software

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- Low-level libraries
  - BLAS, FFTW, LAPACK

L	**A**	**P**	**A**	**C**	**K**
L	**-A**	**P**	**-A**	**C**	**-K**
L	**A**	**P**	**A**	**-C**	**-K**
L	**-A**	**P**	**-A**	**-C**	**K**
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- Sofware frameworks and languages
  - Julia, NumPy, ROOT

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  - Lab-dependent

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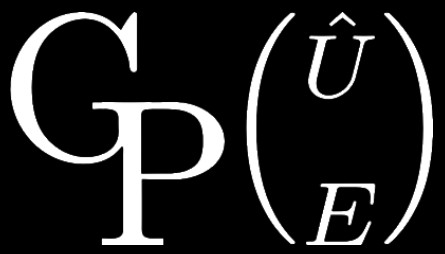

[1]

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- Scripts
  - For a publication

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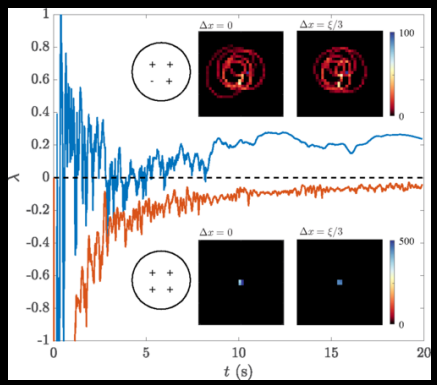
[1]



[2]

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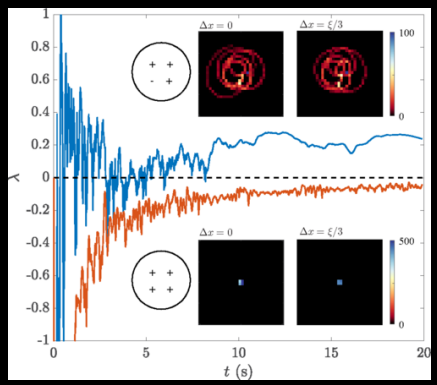

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Different labs need different software, but most labs need *some form* of software

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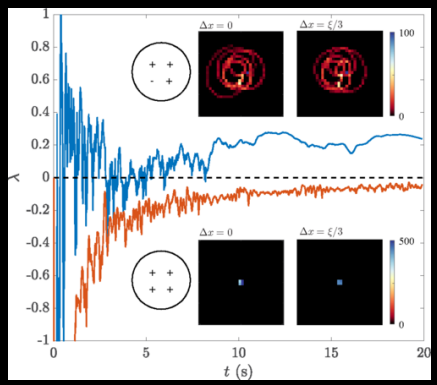

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Scientific software usually requires some form of domain-specific knowledge

Publication economy

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If results depend on software, this software *must* be robust

Software development practices

(For those trained *in* academia)

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Academia does not encourage good software development

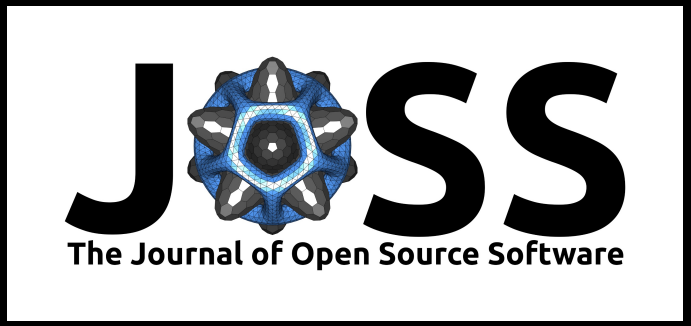
Problem Statement

Research Software Engineers are not funded with money or publications

Solutions

Solutions

- Journal of Open Source Software



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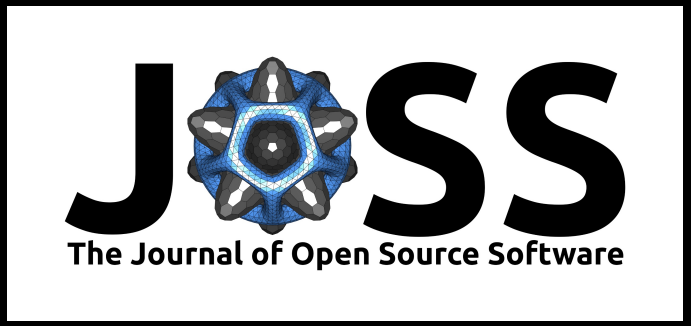

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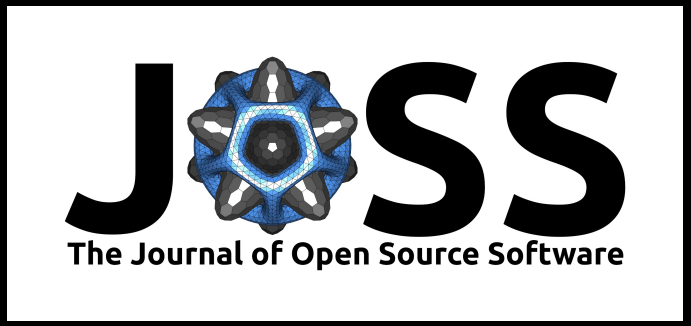

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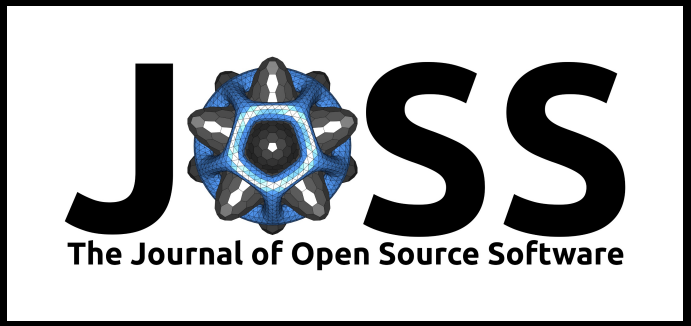

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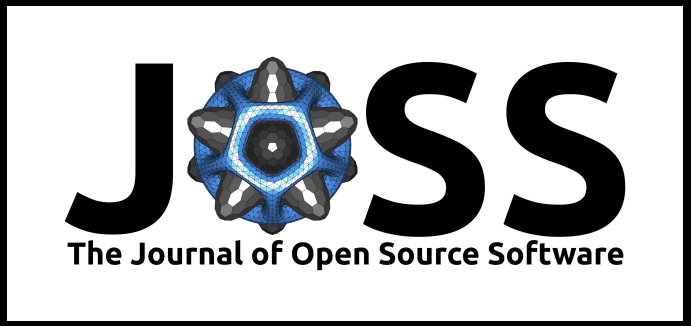

Headway has been made in all of these areas

If scientists are in the business of creating high-quality, replicable scientific results, the software they use *must be* considered part of this process