

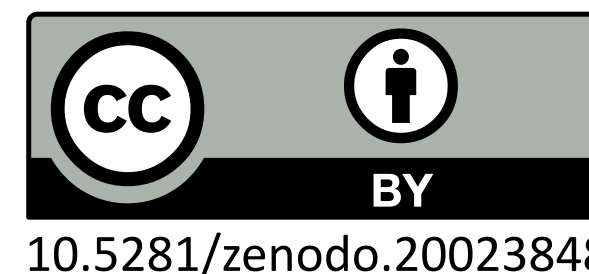
Unpacking Research Software

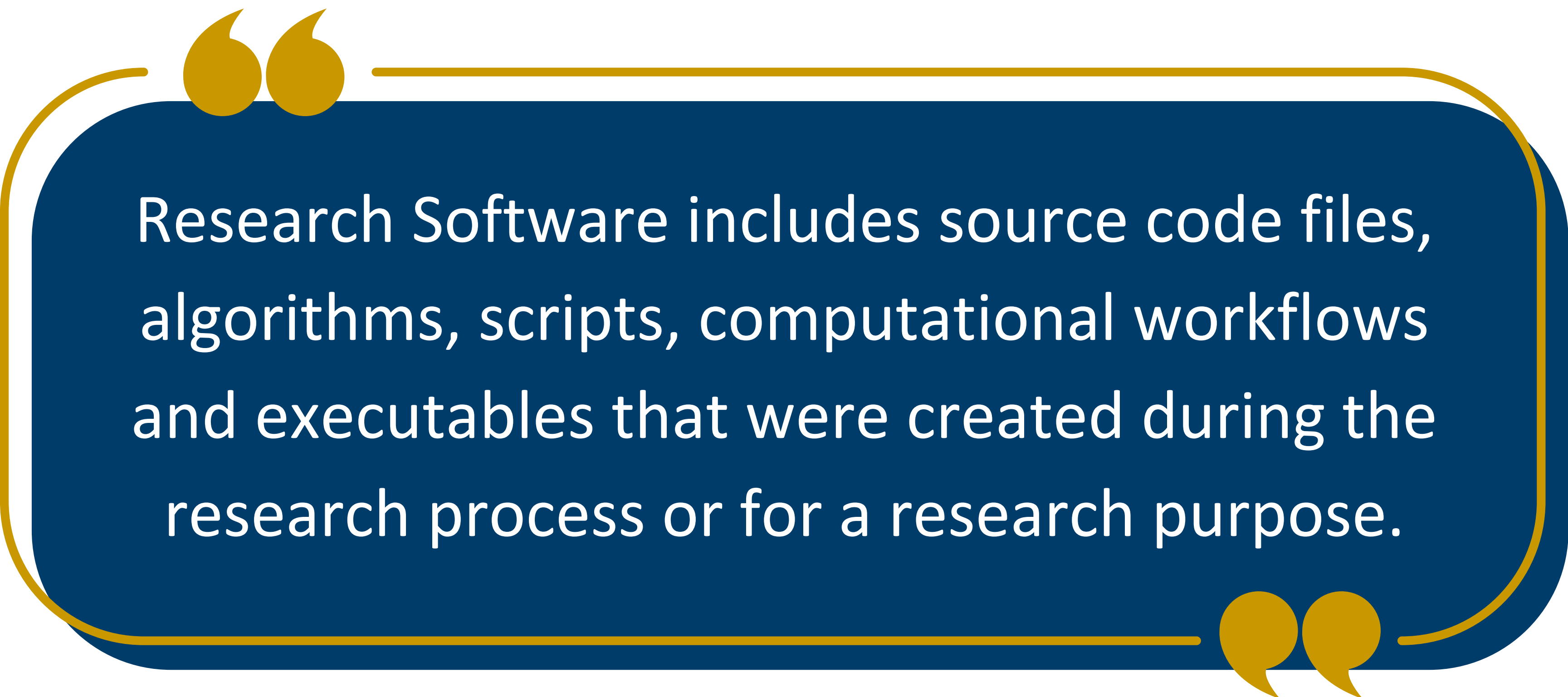
Anelda van der Walt
Senior eResearch Analyst
anelda.vanderwalt@uct.ac.za

UCT Emerging Research Programme
4 May 2026
Online



UNIVERSITY OF CAPE TOWN
IYUNIVESITHI YASEKAPA • UNIVERSITEIT VAN KAAPSTAD





Research Software includes source code files, algorithms, scripts, computational workflows and executables that were created during the research process or for a research purpose.

Where in the research lifecycle do we find research software?



How many tools/software are available?



885,310 Works

Crystal Viewer Tool

Saumitra Mehrotra

Content published 2012 in [HubZero](#)

DOI registered August 22, 2012 via DataCite.

Software

[doi https://doi.org/10.4231/d3vh5ch5n](https://doi.org/10.4231/d3vh5ch5n)

im-tables-biojs

Alexis Kalderimis & Gos Micklem

Content published 2014 in [Zenodo](#)

BioJS InterMine Table component.

DOI registered February 7, 2014 via DataCite.

license [Apache 2.0](#)

Software

[doi https://doi.org/10.5281/zenodo.1000000](https://doi.org/10.5281/zenodo.1000000)

Finite State Space Enumeration and Optimal State Space Enumeration

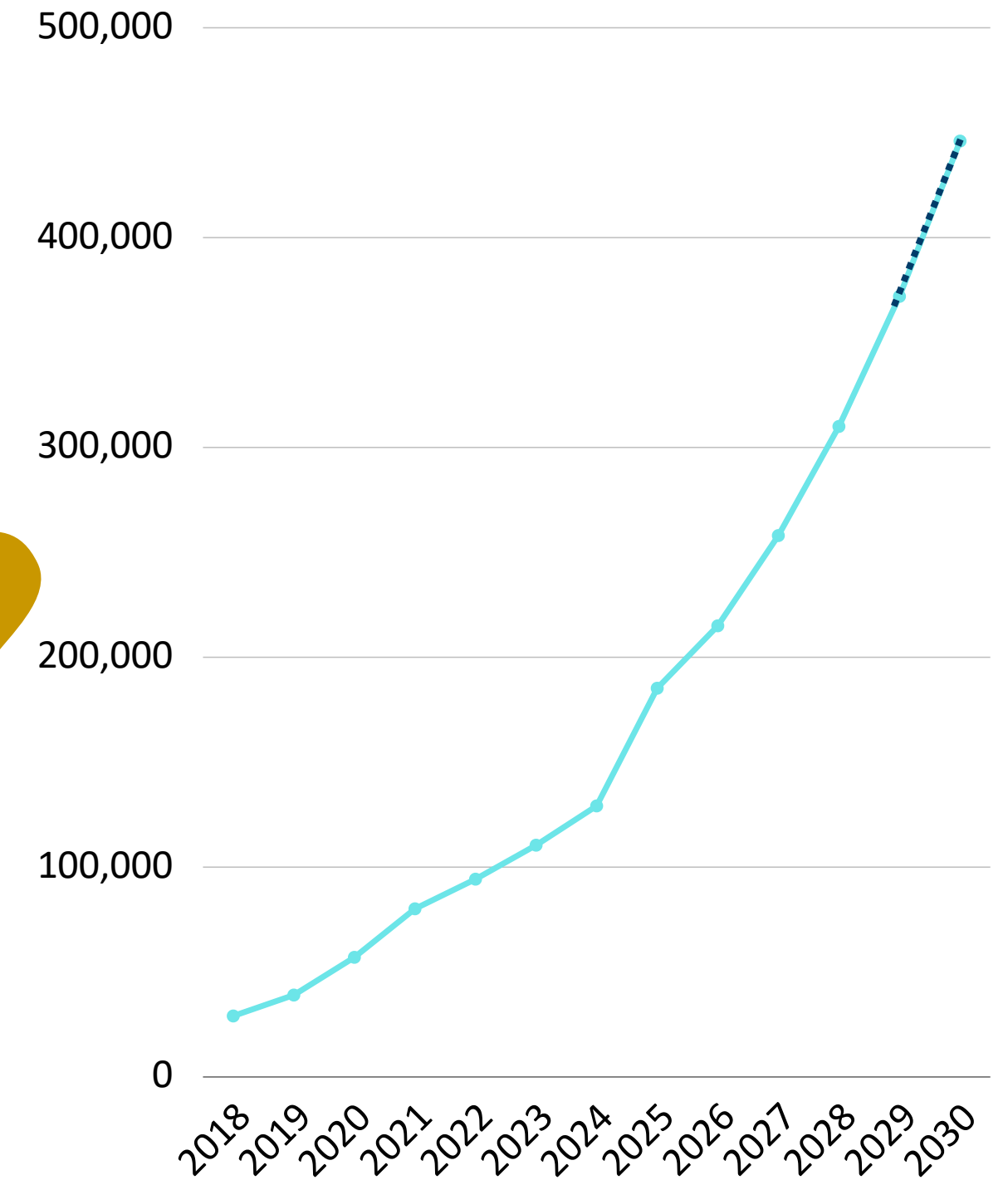
Solution

Creators & Contributors

<input type="checkbox"/>	Simonis, Juniper L.	900
<input type="checkbox"/>	Seko, Atsuto	838
<input type="checkbox"/>	Markiewicz, Christopher J.	674
<input type="checkbox"/>	Gorgolewski, Krzysztof J.	561
<input type="checkbox"/>	Esteban, Oscar	520
<input type="checkbox"/>	Poldrack, Russell A.	481
<input type="checkbox"/>	Ranocha, Hendrik	402
<input type="checkbox"/>	Hyodo, Katsuya	393
<input type="checkbox"/>	Goncalves, Mathias	387
<input type="checkbox"/>	Blair, Ross	365

Publication Year

<input type="checkbox"/>	2026	113,998
<input type="checkbox"/>	2025	182,766
<input type="checkbox"/>	2024	128,997
<input type="checkbox"/>	2023	110,364
<input type="checkbox"/>	2022	94,257
<input type="checkbox"/>	2021	80,150
<input type="checkbox"/>	2020	57,000



[illegible]

How can I find research software?

Research literature

- Methods / Materials sections
- Supplementary materials
- Citations of software
- Footnotes

Research software registries

- Subject-specific e.g bio.tools
- Zenodo
- Figshare
- Software Heritage
- Institutional repos

Research Communities

- Discipline-specific Slack/Discord groups
- Research networks
- Lab websites
- Conference proceedings

Code hosting platforms

- GitHub
- BitBucket
- GitLab

Institutional infrastructure

- HPC-supported software lists
- Institutional documentation
- Research groups in your domain

Workflow tools

- Galaxy Project
 - Nextflow
 - Snakemake
-

What should I consider when deciding on software?

1 FIT THE RESEARCH PROBLEM?

- Does it implement the method you need?
- Does it handle your data type and scale?

Aligns with your methods, data, and goals

3 ENABLE REPRODUCIBILITY?

- Can the process be reliably reproduced?
- Can the methods be documented and shared?
- Can others use the same version?

Promotes transparency and repeatability

5 COST AND ACCESS?

- Is the software affordable over time?
- Can you and collaborators reliably access it?
- Does the license allow use, sharing, and reuse?

Affordable, accessible, and compliant

2 WORK IN YOUR ENVIRONMENT?

- Runs on your infrastructure?
- Integrates with other tools?
- Supports standard formats?

Fits your technical ecosystem and workflow

4 BE SUSTAINABLE TO USE?

- Actively maintained?
- Has a community or support?
- Reasonable learning curve vs your timeline?

Sustainable today and into the future

6 BUILD VS USE (OR EXTEND)?





- Does existing software meet your needs?
- Is extending more efficient than building?
- Does building add clear research value?

Build only when it adds clear research value




Research software is not only a technical decision.
Also consider validity, reproducibility, scalability, and long-term usability.

How should I reference software in publications?




WHAT TO DO

-  Cite software formally (like a paper)
-  Include exact version used
-  Link to code, workflows, repositories (if applicable)
-  Acknowledge infrastructure

AVOID

-  “We used X software...” (no citation)
-  Missing versions
-  No links to computational methods or code

WHY IT MATTERS

-  Enables reproducibility
-  Gives credit to developers
-  Makes your work traceable and credible

EXAMPLE

In text:

We used R version 4.3.2 (R Core Team, 2023)

Reference list:

R Core Team. (2023). R: A language and environment for statistical computing. R Foundation for Statistical Computing.
<https://www.R-project.org/>.

Publication example:

Wells et al., (2026). HLAfreq: Download and combine HLA allele frequency data. Journal of Open Source Software, 11(121), 10122,
<https://doi.org/10.21105/joss.10122>

If software contributed to your research, it should be cited - not just mentioned.

Our Research Software Programme 2026

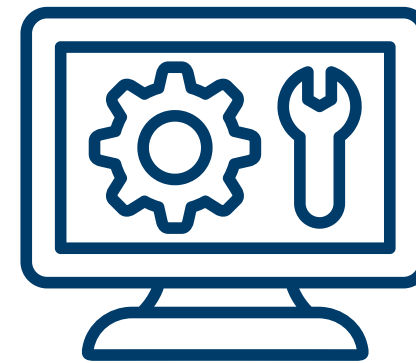
Recognition



Evidence



Practice



Policy



Global Engagement



Laying the groundwork for a UCT Research Software initiative

Next Steps



Connect



dub.sh/ereseach-news



Participate



dub.sh/ereseach-events



Questions?

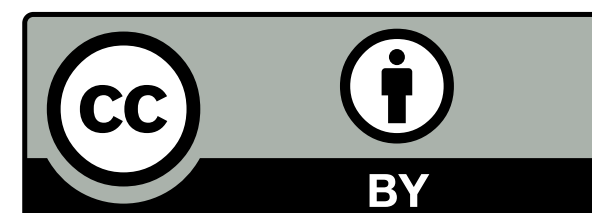
eresearch@uct.ac.za

Thank you!

eresearch@uct.ac.za
<https://uct.ac.za/eresearch>



UNIVERSITY OF CAPE TOWN
IYUNIVESITHI YASEKAPA • UNIVERSITEIT VAN KAAPSTAD



[10.5281/zenodo.20023848](https://doi.org/10.5281/zenodo.20023848)

UCT 
eResearch
ACCELERATING RESEARCH