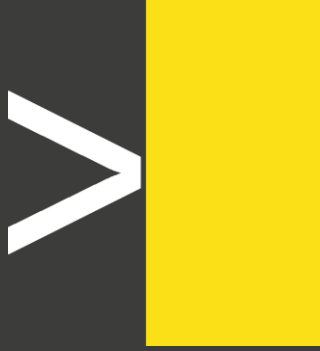




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Risks & Security

cmd-prompt.designinformatics.org

Today's Agenda

-
- 01** **Metascience, AI and Research Software Engineering** — 30 min
Joseph Shingleton (University of Glasgow)
-
- 02** **A (Tiny) Coding Agent on Your Laptop, Offline:
Docker Agent + Docker Model Runner, Step by Step** — 30 min
Philippe Charrière (Docker)

01

Metascience, AI and Research Software Engineering

Joseph Shingleton (University of Glasgow)



University
of Glasgow
Oilthigh Ghlaschu



Research Software, AI and Metascience

Joe Shingleton

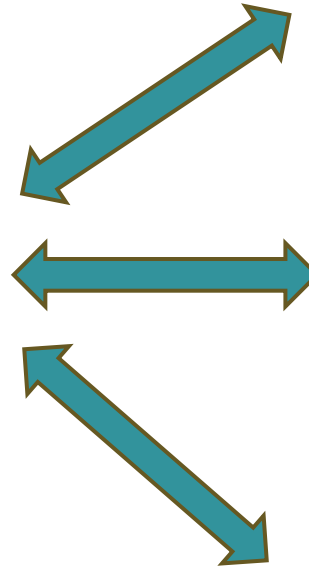


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What is Metascience?

The science of science

- **Methods and reproducibility** – How do we make our science more robust?
- **Funding allocation** – How do we ensure science is funded fairly?
- **Peer review and publication** – How do we review and disseminate our research?
- **Incentives and culture** – How do we properly credit scientific effort?



Funders



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Public Policy Makers



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Metascience AI Fellowships

- Highly interdisciplinary 2-year fellowships exploring how AI is changing science.
- Cohort of 29 international fellows (18 UK, six US, five Canada).
- Funded by:



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“Generative AI and the future of Research Software Engineering”

Three pieces of ongoing work:

1. **A use case for AI in RSE** – Can AI support reproducibility review in computational research?
2. **Identifying the risks** – How do we identify and classify the risks of AI adoption in research software engineering?
3. **Building trust** – How do researchers become confident in the code they have written, and how does this help us with responsible AI adoption?



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1. Can AI help support computational reproducibility?



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AI for Reproducibility in Computational Research

Case Study: AGILE Conference in geospatial data science

Dataset: 20 research papers + code/data repositories + human reproducibility reviews

Method: Agentic approach to assess reproducibility and compare to human reviews

Research questions:

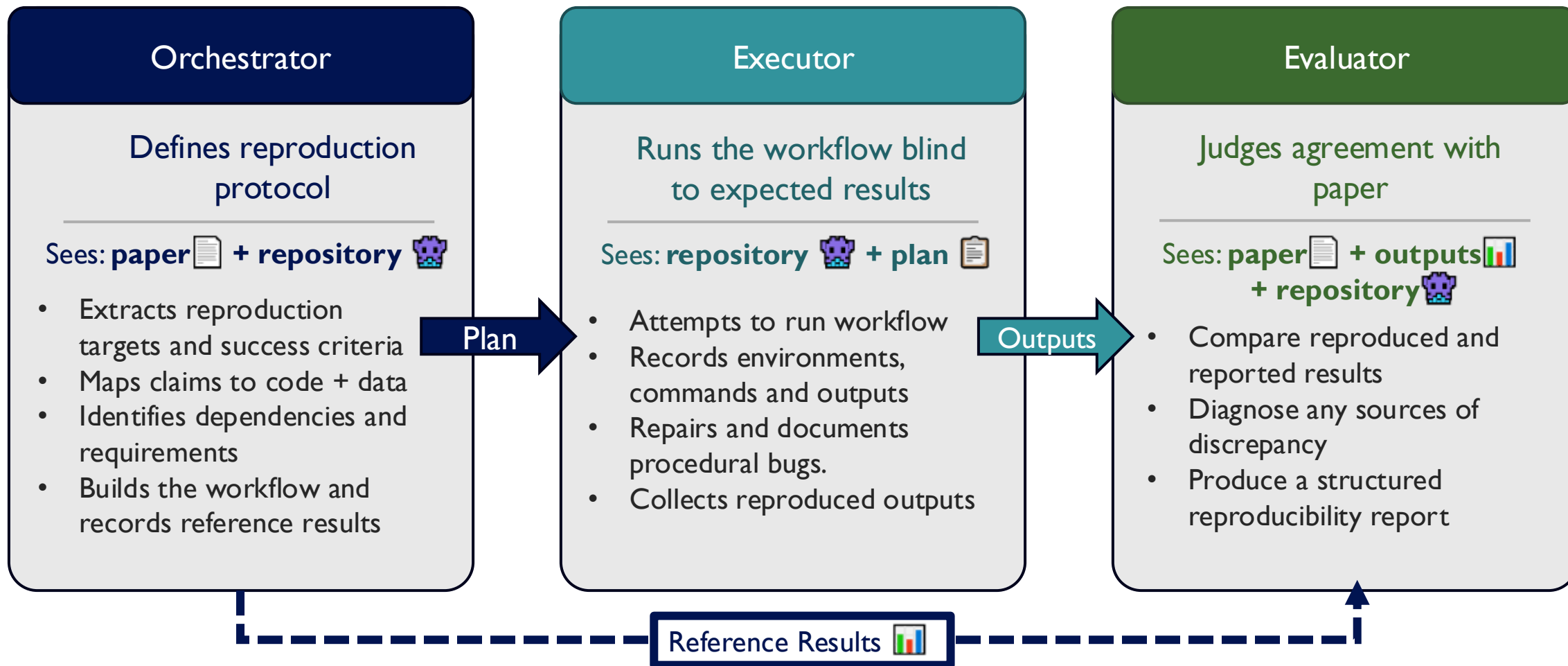
Can AI produce
meaningful reproducibility
reviews?

What are the
characteristics of an AI
review, compared to
human?

What are the trade-offs
when using AI for
reproducibility review?



Agentic AI for reproducibility



Preliminary results:

Testing on synthetic papers/repos with known issues

- Model can consistently identify reproduction issues in a controlled environment

Comparison with human review corpus

- Initial qualitative comparison on small set suggests a good degree of alignment.

Still to do!

- Working towards quantitative framework for comparison.
- No specific numbers on cost/time comparison – but it uses a lot of tokens!



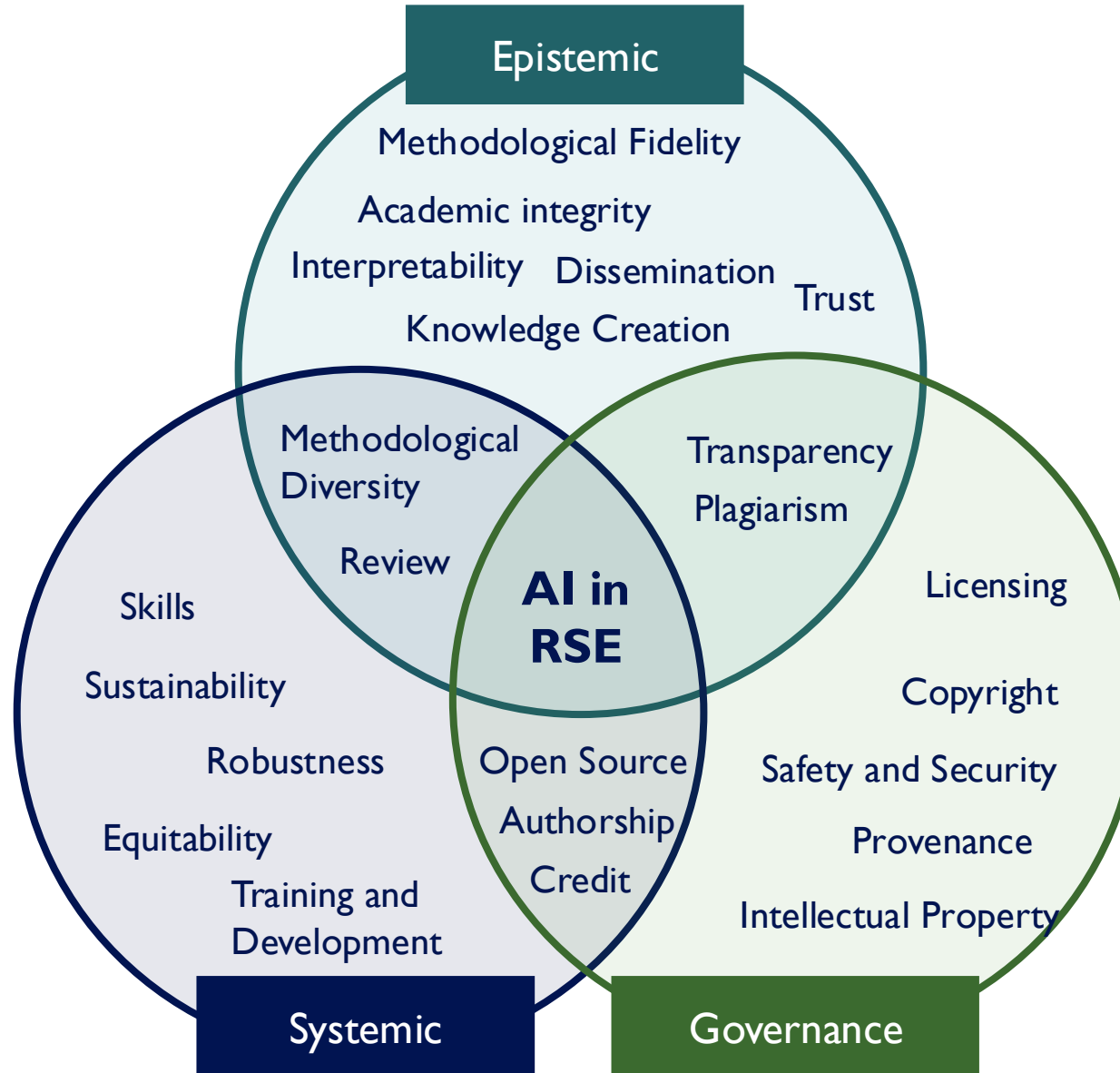
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2. What are the specific risks to AI adoption in RSE practice?



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A proposed taxonomy of risk for AI in RSE:





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What risks do we see in practice?

The **Responsible AI Risk Register** is a forum in which RSE practitioners can document the AI risks that are most relevant to their research.

It's designed to be a useful resource for practitioners, leaders and policy makers.

Contribution is achieved via GitHub issues



Register

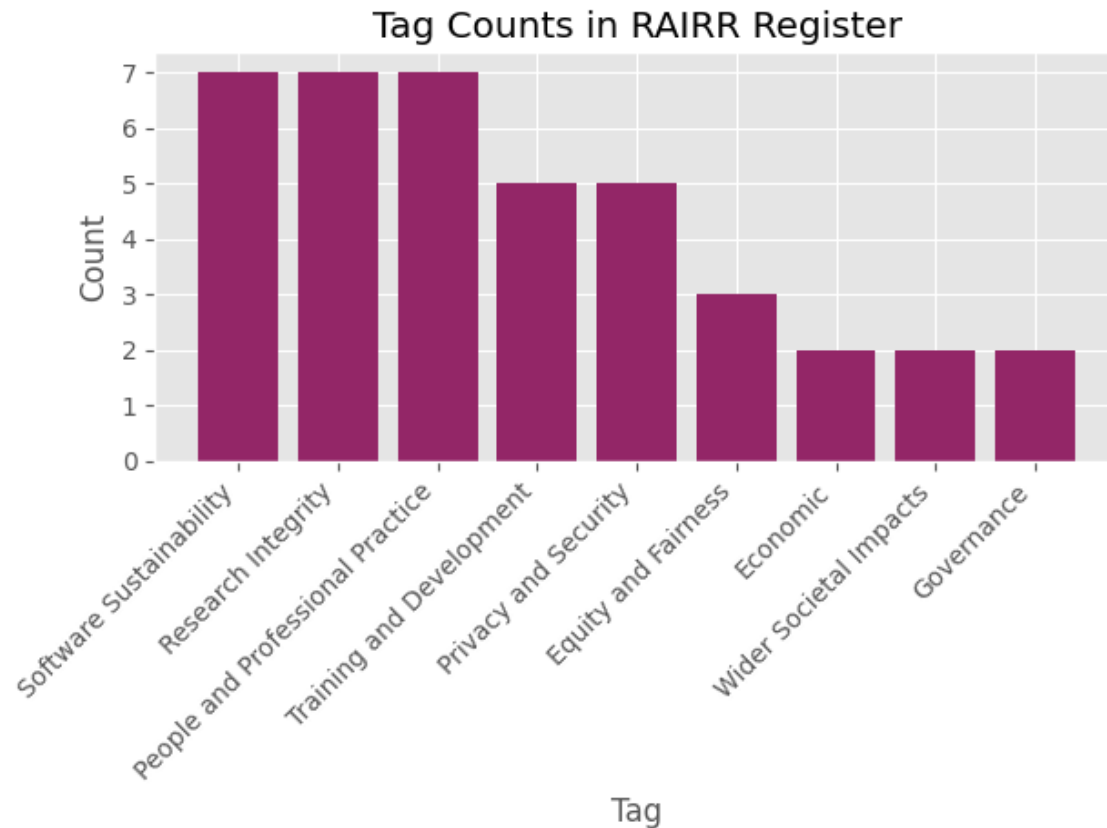


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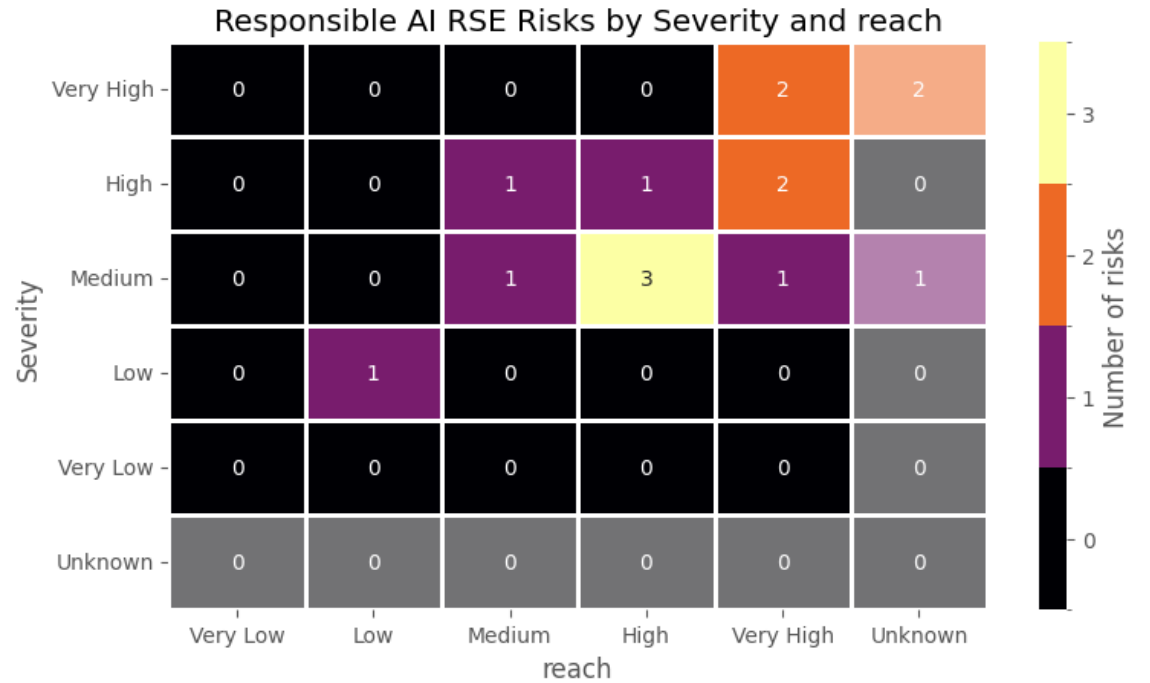
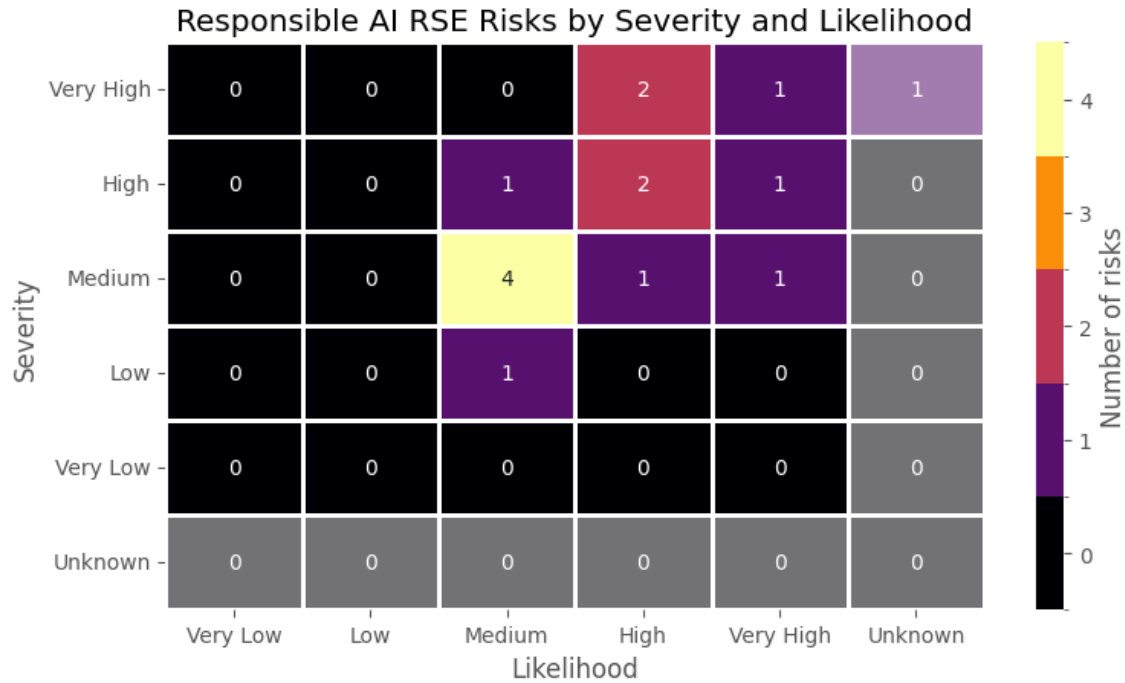
What risks do we see in practice?



Key risk themes:

- **Software Sustainability:** code comprehensibility, technical debt, software performance, IP.
- **Research Integrity:** Correctness of code, scientific accuracy, privacy.
- **People and professional practice:** loss of entry level experience, affordability divides, loss of professional identity

What risks do we see in practice?



***3. How do researchers establish
trust in their computational
outputs?***

Researchers have a duty to “trust” their code

Research Software Engineering can be thought of as a set of practices which permit a researcher to make a software mediated scientific claim (*Shingleton et. al. 2026, preprint*¹)

Follow-up empirical study underway:

Aims: establish the specific practices researchers to establish trust in:

- Their own code and software
- Code and software take from third-party sources
- AI generated code and software.

Methods: Mixed methods study with survey of researchers and follow-up semi-structured interviews.

¹<https://dx.doi.org/10.2139/ssrn.7185258>

To sum up...

- There are a lot of ways AI can improve our research software
- But there are risks that are specific to research which we must be aware of
- Guidance on responsible AI use in research software needs to be guided by trustability and sustainability.

Please get in touch if you want to join the SSI study group on responsible AI!



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GROUP



Thank You!

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LinkedIn

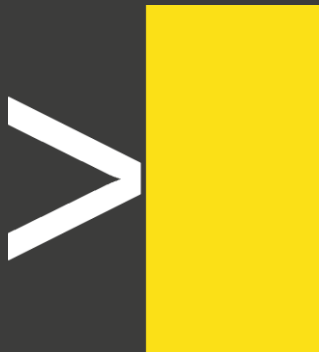
02

A (Tiny) Coding Agent on Your Laptop, Offline: Docker Agent + Docker Model Runner, Step by Step

Philippe Charrière (Docker)

The content of Philippe's talk can be found here:

<https://codeberg.org/talks/2026-08-University-of-Edinburgh-Docker-Agent>



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Thank You

A monthly meetup for software developers at the University of Edinburgh
to discuss AI-assisted coding.

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