Open Research Europe

Benefits for Researchers: the process of publishing in ORE

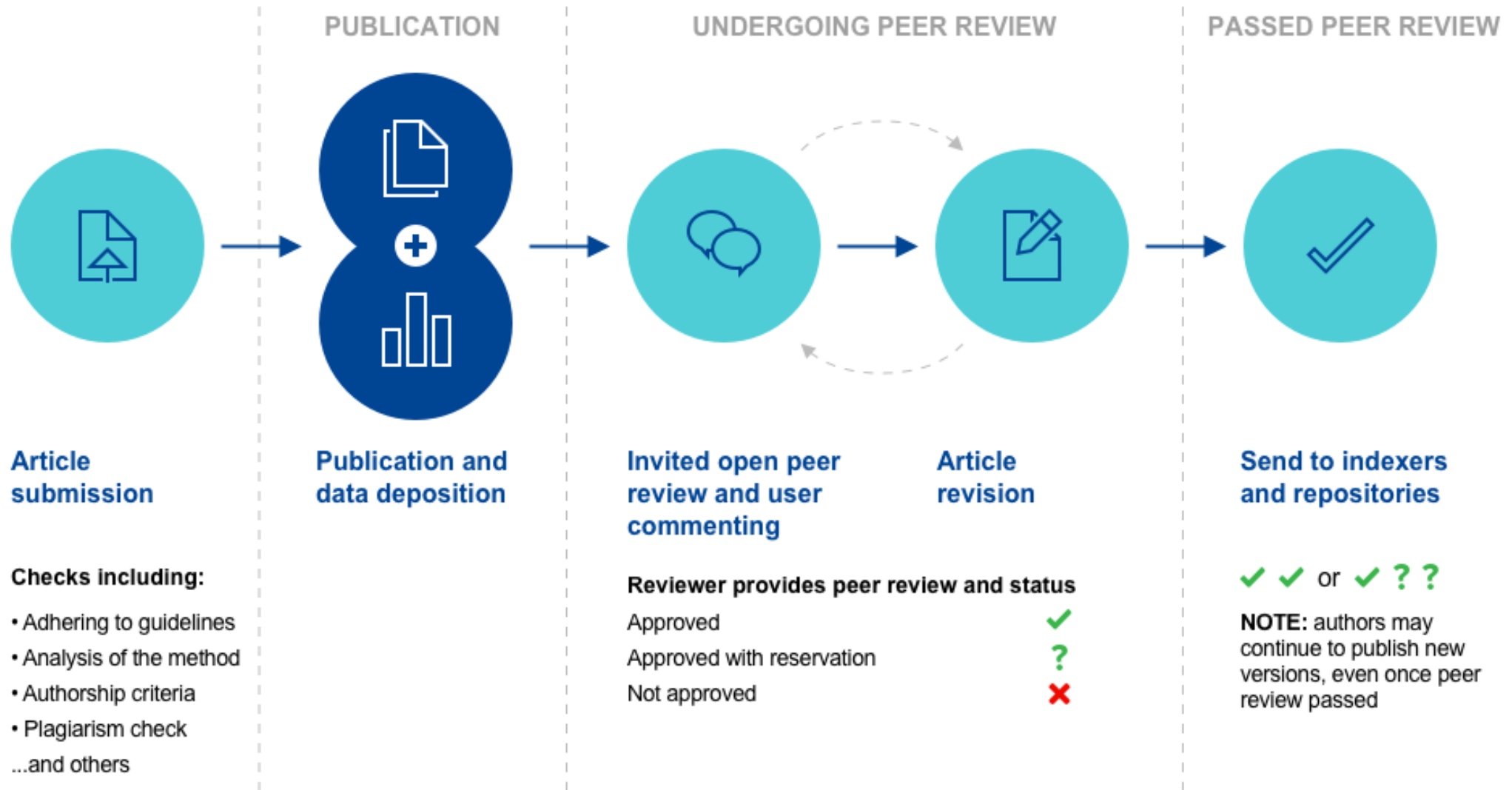European Commission

Powered by
F1000 Research

The model

How does it actually work?

PUBLICATION   UNDERGOING PEER REVIEW   PASSED PEER REVIEW

Article submission

Checks including:

• Adhering to guidelines
• Analysis of the method
• Authorship criteria
• Plagiarism check
...and others

Publication and data deposition

Invited open peer review and user commenting

Reviewer provides peer review and status

Approved ✔
Approved with reservation ?
Not approved ✘

Article revision

Send to indexers and repositories

✔ ✔ or ✔ ? ?

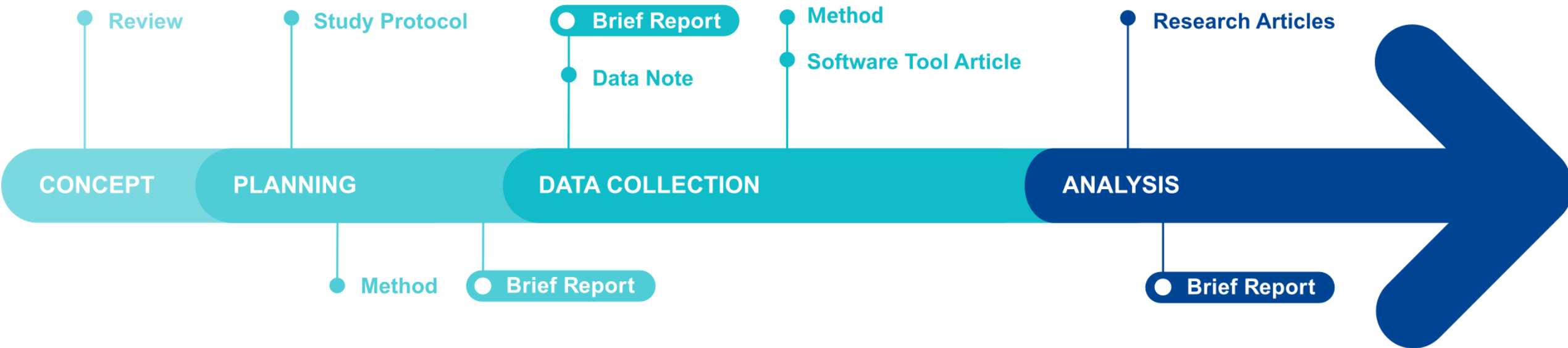**NOTE:** authors may continue to publish new versions, even once peer review passed

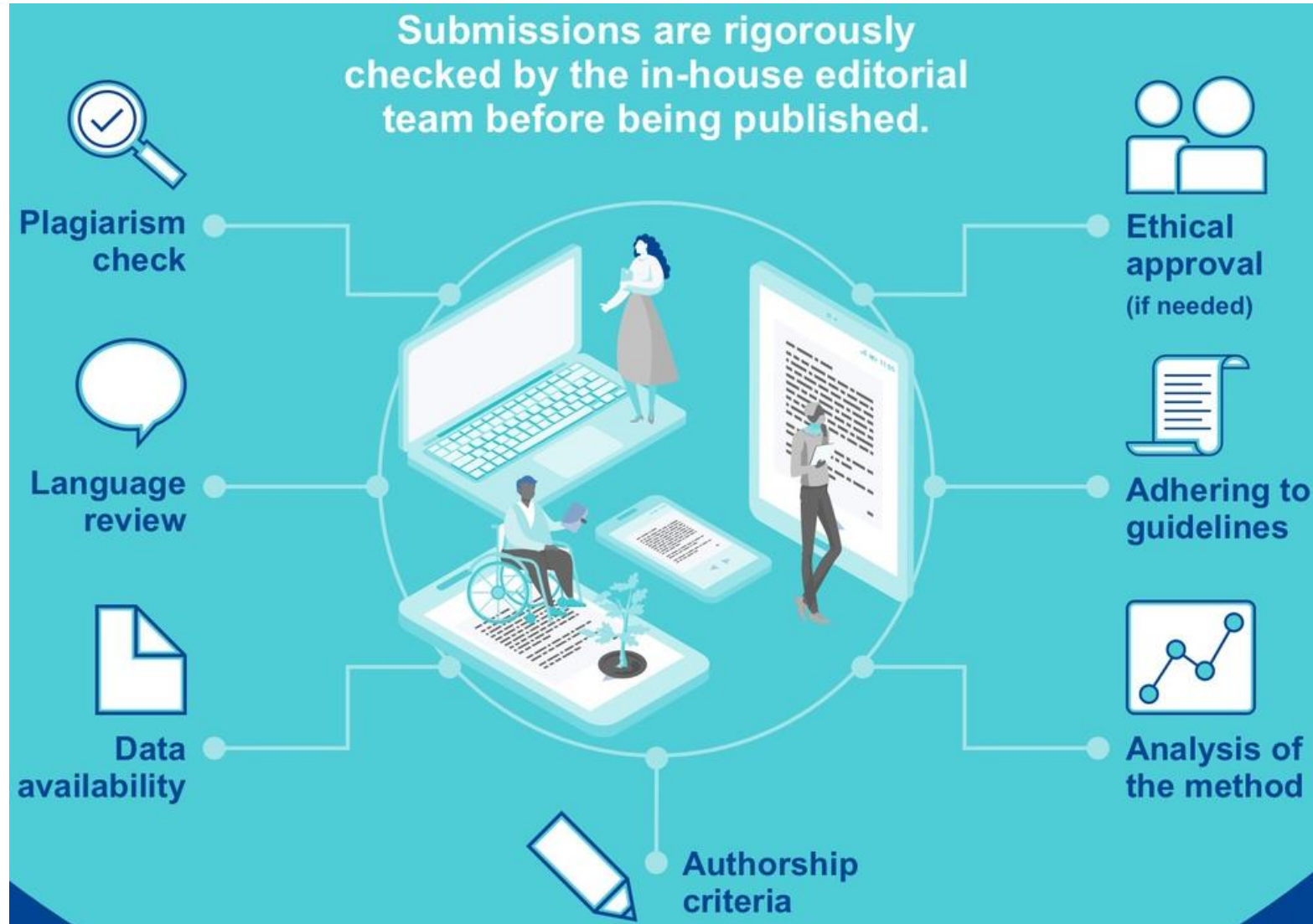# Supporting research across all disciplines

	Natural sciences	Engineering and technology	Medical and health sciences	Agricultural and veterinary sciences	Social sciences	Humanities and the arts
Case Study	●	●	●	●	●	●
Research Article	●	●	●	●	●	●
Brief Report	●	●	●	●	●	●
Data Note	●	●	●	●	●	●
Method Article	●	●	●	●	●	●
Open Letter	●	●	●	●	●	●
Software Tool Article	●	●	●	●	●	●
Review	●	●	●	●	●	●
Case Report	●	●	●	●		
Registered Report	●	●	●	●	●	
Clinical Practice Article	●	●	●	●		
Study Protocol	●	●	●	●	●	
Systematic Review	●	●	●	●	●	
Essay					●	●

Publish throughout the project …

… and after it!

Pre-publication checks

Submissions are rigorously checked by the in-house editorial team before being published.

Plagiarism check

Language review

Data availability

Authorship criteria

Ethical approval (if needed)

Adhering to guidelines

Analysis of the method

Production

- Once the paper passes the pre-publication checks you will receive an acceptance email

- Manuscript is then typeset and converted into PDF and XML using interoperable methods

- The proof is sent back to the authors for a final check

- Article is published in HTML and available for download in PDF

- Paper sent to any indexers that accept papers **before** peer review

- Archive the papers to ensure permanency of content

- Authors must suggest five potential reviewers by the end of this stage

An example

66 Cite   ⬇ Download ▾   → Export ▾   ⬱ Share ▾   ⊚ Track

Home > Articles > Towards an integrated automatic design process for robot swarms

RESEARCH ARTICLE 🔓

REVISED Towards an integrated automatic design process for robot swarms [version 2; peer review: 3 approved]

Darko Bozhinoski ✉ 🆔, Mauro Birattari ✉ 🆔

This article is included in Excellent Science gateway

This article is included in Robotics collection

Article   Authors   Metrics

Abstract

Background: The specification of missions to be accomplished by a robot swarm has been rarely discussed in the literature: designers do not follow any standardized processes or use any tool to precisely define a mission that must be accomplished. **Methods:** In this paper, we introduce a fully integrated design process that starts with the specification of a mission to be accomplished and terminates with the deployment of the robots in the target environment. We introduce Swarm Mission Language (SML), a textual language that allows swarm designers to specify missions. Using model-driven engineering techniques, we define a process that automatically transforms a mission specified in SML into a configuration setup for an optimization-based design method. Upon completion, the output of the optimization-based design method is an instance of control software that is eventually deployed on real robots. **Results:** We demonstrate the fully integrated process we propose on three different missions. **Conclusions:** We aim to show that in order to create reliable, maintainable and verifiable robot swarms, swarm designers may benefit from following standardised automatic design processes that will facilitate the design of control software in all stages of the development.

Open Peer Review

Approval Status ✓ ✓ ✓   ⓘ

	1	2	3
Version 2 (Revision) 04 Nov 22			✓ view
Version 1 27 Sep 21	✓ view	✓ view	↑ ✓ view

1. Adam Schroeder 🆔, University of Toledo, Toledo, OH, USA

2. Alan Millard 🆔, University of York, York, UK

3. Edmund Hunt 🆔, University of Bristol, Bristol, UK
   James Ward, University of Bristol, Bristol, UK; University of Bristol, Bristol, UK

Comments on this article

All Comments (0)

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| Email address * | **Sign Up** |

Reviewer selection

- **Qualified -** reviewers are checked they have the correct expertise

- **Expert -** at least 3 articles as lead author in a relevant topic, with at least 1 article having been published in the last 5 years

- **Impartial -** no co-authoring with lead authors in the 3 years preceding; don't work at the same institution; are not a close collaborator with an author, no competing interests

- **Global -** for any given article, we require authors to suggest geographically-diverse reviewers

- **Diverse -** reviewers should be diverse with regards to their gender, location and career stage

- **Additional expertise -** e.g., statistics experts required if necessary

An example

✔ Approved

07 Jun 2022   VERSION 1

Edmund Hunt ⓘ, University of Bristol, Bristol, UK

James Ward, University of Bristol, Bristol, UK; University of Bristol, Bristol, UK

❞ Cite this Report

🗩 Responses (1)

This paper presents work on a textual language ('SML') for specification of swarm robot missions, and an engine to transform this SML into a form that can be used by the previously published 'AutoMoDe-Chocolate' automatic controller designer. The pipeline from mission specification to deployment is demonstrated in three example missions.

The ambitious goal to show a 'fully integrated design process' for swarm deployment, using off-line optimization methods, is met with an initial proof concept. Obviously, much work remains to be done on showing that this approach will be successful in 'real world' environments, both in relation to mission success (relative to alternative approaches, e.g. hand-design of controllers) and usability for non-expert users. But it is a useful step in that direction, and the paper therefore is a meaningful contribution to the field.

Specific points arising:

- Given the focus on swarms and emergent behaviour – e.g. the Introduction "Hence, the collective behavior of a robot swarm is a result of the local interactions between the individual robot and its neighbors and its environment" – the three missions tested do not especially rely on neighbour interactions/emergence, and could equally be tested on a single robot? And so the real-world validation is arguably on the boundary of what could properly be called swarm robotics, and I look forward to the promised future work on e.g. collective decision-making missions.

- In the Abstract, I would contest the claim that 'swarm designers need to follow standardised automatic design processes…' I suggest 'may benefit from following' rather than 'need to'.

Responses (1)

AUTHOR RESPONSE 4 NOVEMBER 2022

Darko Bozhinoski

We are glad that the reviewer appreciated the work we have performed. In the following, we address his comments point by point.

- Concerning the idea of creating a graphical interface to facilitate the usage of SML, we extended the Conclusions by adding this research direction as a future contribution.

- Concerning the large design budget of 200k simulation runs, we would like to stress that the decision of adopting such a large design budget is outside of the specific scope of the contribution we are making with this paper. We decided to adopt a large design budget, so that the design process has sufficient resources to obtain a controller that performs well. The focus here is on the specification of the mission and on the automatic process that transforms specifications into the input to be fed to Chocolate.

- Concerning the fact that the automatic design method Chocolate operates on only six low-level behaviours and 6 conditions, we would like to stress that the focus in this paper is not Chocolate per se, but rather how to define a fully automatic design process (from specifications to the actual execution of the mission). As we already mentioned in answer to the other reviewers, this work is only a first step towards an integrated automatic design process for robot swarms: a proof of concept implementation. Extending the framework from a lab-based environment to a real-world environment is definitely an important issue that will be addressed in future research work. In the Behaviour-Data Relations Modelling Language (BDRML) [1] approach, the authors propose a methodology to represent robot behaviours, data, and a set of conditional relations between the different primitives. In contrast, the main focus in our work is on establishing an end-to-end automatic approach where from a mission specification in natural language, swarm control software can be obtained without focusing on the specificities of data structures and behaviours.

- Concerning the idea of testing the approach on missions where the simulation environment does not fully match the deployment environment, we would like to point out that our current approach already provides support for it. Many environmental features can be described in a probabilistic manner, meaning that the automatic design process generates control software that is trained on a representative set of environments that are different from the one into which the swarm is eventually deployed. We refer to a class of missions (environments) and we only make the working hypothesis that all the environments experienced in simulation and the real one into which the swarm is deployed are part of the same mission class.

Passing peer review

✔ **APPROVED**
The paper is scientifically sound in its current form and only minor, if any, improvements are suggested

? **APPROVED WITH RESERVATIONS**
A number of small changes, sometimes more significant revisions are required to address specific details and improve the papers academic merit.

✖ **NOT APPROVED**
Fundamental flaws in the paper seriously undermine the findings and conclusions
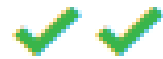
✔ ✔ **2 'Approved' Status**

✔ ? ? **2 'Approved with reservations' and 1 'Approved' Status**

Important:

Once published, articles can not be removed or published elsewhere

Other key features

- **Transparent** – entire publishing process and all policies are detailed on the website

- **Flexibility for different disciplines –** not a 'one size fits all' approach

- **Community driven –** collaboration with the ~25 Advisory Board members and ~120 Community Gateway & Collection Advisors

- **Resource hub -** educational resources to assist with understanding the model

- **Easy submission -** short one page submission form and flexibility in the format

- **Blog -** Engaging and informative thought leadership pieces and author/advisor perspectives

Organisation of content

Open Research Europe

Organisation of content

Gateways

Gateways   Community Gateways   Collections

Gateways provide dedicated portals for the different funding programmes, programme areas and their thematic sections. In each gateway, you will find articles published on Open Research Europe that are linked to projects funded under each funding.

COST Actions

This gateway hosts the articles published on Open Research Europe stemming from COST Actions.

Euratom

This gateway hosts the articles published on Open Research Europe stemming from Euratom supported by Horizon 2020 and Horizon Europe.

European Research Council (ERC)

The European Research Council supports frontier research, cross disciplinary proposals and pioneering ideas in new and emerging fields which introduce unconventional and innovative approaches. This gateway hosts the articles stemming from ERC funded projects.

Horizon 2020

Horizon 2020 was the EU's research and innovation funding programme from 2014-2020. This Gateway hosts the articles published on Open Research Europe that were funded by Horizon 2020.

Horizon Europe

Horizon Europe is the EU's current key funding programme for research and innovation. This Gateway hosts published articles on Open Research Europe that we funded by Horizon Europe.

Marie-Sklodowska-Curie Actions (MSCA)

The Marie Skłodowska-Curie actions (MSCA) provide grants for all stages of researchers' careers and encourage transnational, intersectoral and interdisciplinary mobility. This gateway hosts the articles stemming from MSCA funded projects.

Organisation of content

Community Gateways

Gateways   **Community Gateways**   **Collections**

Community Gateways are dedicated hubs within Open Research Europe to bring together all content related to a specific area of research. They can be tracked to trigger email alerts whenever there is new research published within the Community Gateways of interest.

Agriculture, Land and Farm Management

The Agricultural, Land and Farm Management Community Gateway is the home for research ensuring the correct use and management of land for agricultural functions and interests, and is led by Dr. Olivier Le Gall.

Analytical Chemistry

Analytical chemistry involves the separation, identification and quantification of the composition and structure of matter in both natural and artificial substances. This Community Gateway is led by Dr. Imad El Haddad.

Animal and Dairy Science

The Animal and Dairy Science community gateway is focused on publishing both industry- and lab-based research relating to animal and dairy produce, and is led by Dr. Emer Kennedy.

Arts

This multidisciplinary gateway showcases research on all aspects of the Arts, a field encompassing an immense variety of human practices with creative expression and imagination at their core. This Community Gateway is led by Dr Ruth Sargent Noyes.

Organisation of content

Collections

Gateways   Community Gateways   **Collections**

Collections are compilations of content relating to a specific Horizon 2020 or Horizon Europe-funded community, project or conference.

Active Living as a Lifestyle

Being habitually active is regarded as a healthy lifestyle, leading to healthy ageing and longevity. Ensuring all society members are able to lead an active lifestyle is paramount for reducing costs to health services. This collection is a dedicated area for research on activity prescription, promotion and monitoring, with a particular focus on inclusivity.

Adaptation to Climate Change

This collection draws on the interdisciplinary nature of climate research in the Horizon funding programmes, looking at both current climatic conditions as well as the lessons that can be learned from climatic changes in the past. It is led by Dr. Jana Voříšková.

Additive Manufacturing

Additive Manufacturing refers to technologies that produce three-dimensional objects one superfine layer at a time. It has many applications across Engineering. Examples include the creation of weight-saving, complex geometric designs for Aerospace Engineering, the rapid prototyping in Automotive Engineering, and creating custom on-demand surgical implants in Medical Engineering.

Advances in Optics

Optics is concerned with studying and understanding the behavior and properties of light, specifically in relation to its interaction with different media. This collection focuses on the latest developments within this field of physical sciences.

Academic Community Involvement

Academic Community Involvement

Global authorship

1,800+ Authors

340+ Institutions

45+ Countries

Spain Italy UK Top author locations

Indexation

Article metrics
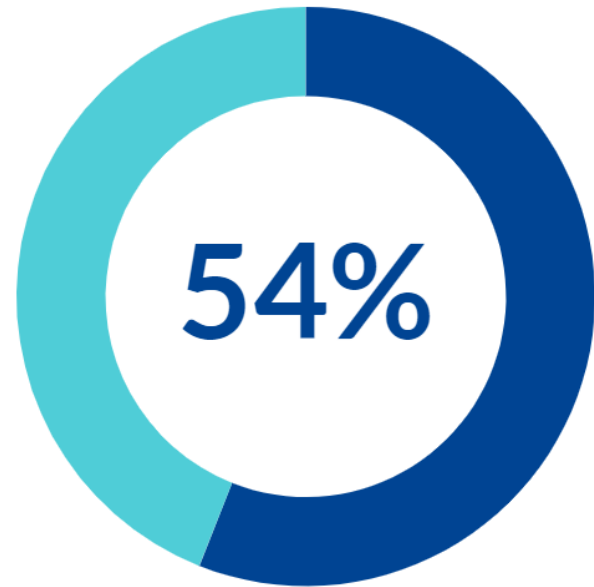
54%   Traditional Research Articles

46%   Other article types

Method Articles

Case Reports

Software Tools

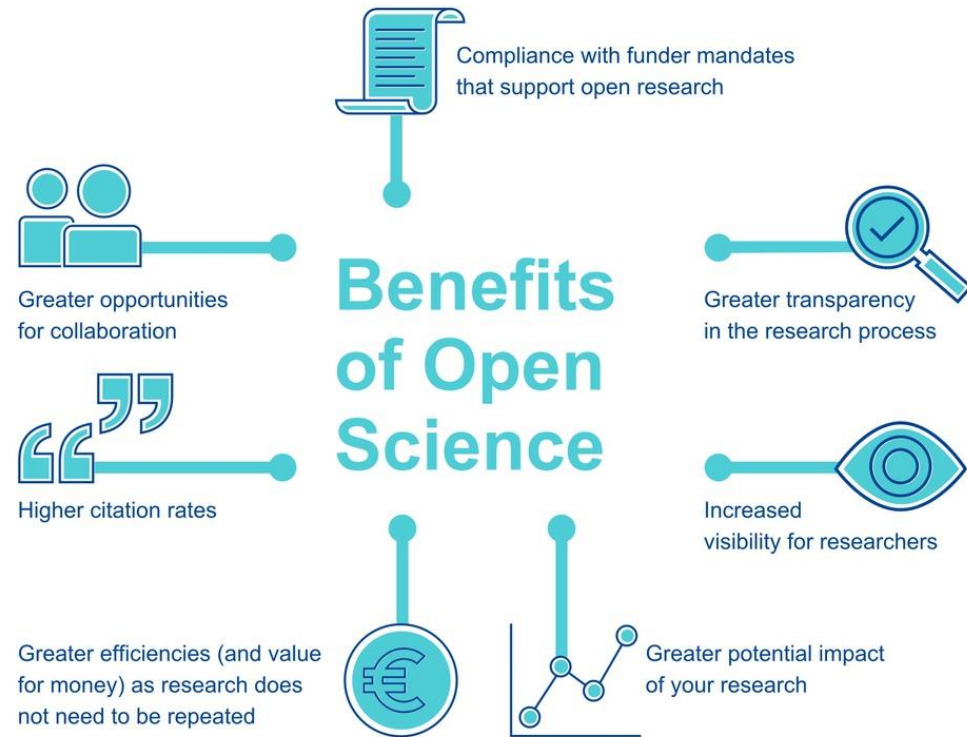**29 000+** total views

7 100+ total downloads

Benefits for authors

Open Research Europe

Benefits for the authors

Compliance with funder mandates that support open research

Greater opportunities for collaboration

Greater transparency in the research process

Benefits of Open Science

Higher citation rates

Increased visibility for researchers

Greater efficiencies (and value for money) as research does not need to be repeated

Greater potential impact of your research

Open Research Europe in Action

Efficient

- Rigorous open peer review
- Rapid and transparent
- International scientific advisory board

Impactful

- Immediate open access
- Article-level metrics
- Open data for reproducibility and reuse

Stress-free

- Optional service*
- No administrative burden
- No author fees
- Automatic compliance with open access requirements

* Service available also after grant has ended

Open Research Europe

Benefits for Researchers

Boost the credibility of your research

Open data enables replication and validation of your research, which in turn boosts its credibility and robustness. By sharing your data openly, your entire research project becomes more transparent (and satisfies funder requirements, to boot).

Enhance the visibility of your work

Increase the discoverability of your research by reciprocally linking your article and its related datasets. Plus, describing your data with rich, meaningful, machine-readable metadata makes it easy for humans (and computers!) to find and use.

Progress in your career

Researchers can benefit from increased credit and recognition for their outputs by sharing their research data, which in turn may lead to increased opportunities for collaboration – even across disciplines. Plus, one 2019 study suggests that open data can generate up to 25% more citations!

Develop a better understanding of your field

Open data supports learning and enables a deeper, richer understanding of the research topic – this is particularly useful in teaching, as students are able to interrogate raw research data for themselves.

ORE in the wider scholarly publishing landscape

- Open Research Europe was identified as an example of **successful implementation of Plan S** in the **2022 Annual Report**

- May 2023 Council of the EU conclusions *"**encourage Member States to support the pilot programme Open Research Europe** (to create a large-scale open access research publishing service)"* as well as **promoting open peer review** practises

- Supports the **recognition of diverse contributions to research**

- The open data policy promotes the broadest reuse of research data thus contributing to **reproducibility, rigor and integrity**

- Aligns with the abandonment of inappropriate metrics such as Journal Impact Factor (JIF), instead promoting the **responsible use of individual article**

Open Research Europe

European Commission | Powered by F1000 Research

The future of ORE

Open Research Europe

What's next for Open Research Europe?

- New tender under consideration will last from **March 2024 – 2026**

- Will include connection to OpenAIRE and **multi-language metadata** (including abstracts)

- A **top-quality, trusted** pan-European OA publishing service

- Collectively driven, owned and **supported by European research funders and research institutions**, as a service for researchers, with no author-facing fees

- Supported by an open source infrastructure

- Ambition for ORE to be a **Diamond OA** publishing service

Implementing this vision

- In **discussion** with interested national funders across Europe, aiming at:

  - Further detailing the vision, with a roadmap for implementation (by spring 2023)
  - Converging on a not-for-profit business model (operation and financing) (by summer 2023)
  - Soliciting participation and funding commitments (by end-2023)

- Supporting the transition to an **open source infrastructure** to underpin innovative publishing workflows

- Ensuring an **uninterrupted service for researchers** all the way

Thank you! Questions?

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