Finiteness properties in infinite-dimensional algebraic geometry

A Data Management Plan created using DMPonline.be

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Project abstract:

The research objectives of my proposal concern questions on finiteness in infinite-dimensional algebraic geometry appearing in two different contexts: arc spaces of algebraic varieties, and infinite-dimensional spaces with a large group of symmetries. The common theme is that the systematic study of these objects requires tools that are beyond the limits of classical algebraic geometry. In my research I make use of groundbreaking recent results: the description of the sheaf of differentials on the arc space by de Fernex and Docampo, and topological Noetherianity of polynomial functors by Draisma. On the side of arc spaces, I will investigate connections between the structure of the arc space and singularities of algebraic varieties using invariants such as embedding codimension, which was introduced in a joint work with de Fernex and Docampo. On the other side, I will work on questions of topological Noetherianity for spaces arising from the representation theory of different infinite-dimensional groups. These two projects converge in studying singularities of subvarieties of polynomial functors. These foundational aspects of my project will have applications to multiple fields inside mathematics, such as birational geometry, differential algebra, representation theory and applied algebraic geometry.

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1. Research Data Summary

List and describe all datasets or research materials that you plan to generate/collect or reuse during your research project. For each dataset or data type (observational, experimental etc.), provide a short name & description (sufficient for yourself to know what data it is about), indicate whether the data are newly generated/collected or reused, digital or physical, also indicate the type of the data (the kind of content), its technical format (file extension), and an estimate of the upper limit of the volume of the data.

The research conducted in this project concerns questions in mathematical fields which do not involve the collection, generation or processing of data. No datasets will be referenced.

If you reuse existing data, please specify the source, preferably by using a persistent identifier (e.g. DOI, Handle, URL etc.) per dataset or data type:

N/A

Are there any ethical issues concerning the creation and/or use of the data (e.g. experiments on humans or animals, dual use)? Describe these issues in the comment section. Please refer to specific datasets or data types when appropriate.

- No

Will you process personal data? If so, briefly describe the kind of personal data you will use in the comment section. Please refer to specific datasets or data types when appropriate.

- No

Does your work have potential for commercial valorization (e.g. tech transfer, for example spin-offs, commercial exploitation, …)? If so, please comment per dataset or data type where appropriate.

- No

Do existing 3rd party agreements restrict exploitation or dissemination of the data you (re)use (e.g. Material/Data transfer agreements/ research collaboration agreements)? If so, please explain in the comment section to what data they relate and what restrictions are in place.

- No

Are there any other legal issues, such as intellectual property rights and ownership, to be managed related to the data you (re)use? If so, please explain in the comment section to what data they relate and which restrictions will be asserted.

- No

2. Documentation and Metadata

Clearly describe what approach will be followed to capture the accompanying information necessary to keep data understandable and usable, for yourself and others, now and in the future (e.g., in terms of documentation levels and types required, procedures used, Electronic Lab Notebooks, README.txt files, Codebook.tsv etc. where this information is recorded).

N/A

Will a metadata standard be used to make it easier to find and reuse the data? If so, please specify (where appropriate per dataset or data type) which metadata standard will be used. If not, please specify (where appropriate per dataset or data type) which metadata will be created to make the data easier to find and reuse.

- No

3. Data storage & back-up during the research project

Where will the data be stored?

N/A

How will the data be backed up?

N/A

Is there currently sufficient storage & backup capacity during the project? If yes, specify concisely.
If no or insufficient storage or backup capacities are available, then explain how this will be taken care of.

- Yes

How will you ensure that the data are securely stored and not accessed or modified by unauthorized persons?

N/A

What are the expected costs for data storage and backup during the research project? How will these costs be covered?

No costs will be incurred as no data will be stored or considered for backup.

4. Data preservation after the end of the research project

Which data will be retained for at least five years (or longer, in agreement with other retention policies that are applicable) after the end of the project? In case some data cannot be preserved, clearly state the reasons for this (e.g. legal or contractual restrictions, storage/budget issues, institutional policies...).

No data will be collected as part of this research project, and hence no data will be retained after the end of the project.

Where will these data be archived (stored and curated for the long-term)?

N/A

What are the expected costs for data preservation during the expected retention period? How will these costs be covered?

No costs will be incurred.

5. Data sharing and reuse

Will the data (or part of the data) be made available for reuse after/during the project? In the comment section please explain per dataset or data type which data will be made available.

- Other, please specify:

No data will be collected during the research conducted during this project.

If access is restricted, please specify who will be able to access the data and under what conditions.

N/A

Are there any factors that restrict or prevent the sharing of (some of) the data (e.g. as defined in an agreement with a 3rd party, legal restrictions)? Please explain in the comment section per dataset or data type where appropriate.

- No

Where will the data be made available? If already known, please provide a repository per dataset or data type.

N/A

When will the data be made available?

N/A

Which data usage licenses are you going to provide? If none, please explain why.

N/A

Do you intend to add a PID/DOI/accession number to your dataset(s)? If already available, you have the option to provide it in the comment section.

- No

No datasets will be collected during the research conducted as part of this project.

What are the expected costs for data sharing? How will these costs be covered?

No costs will be incurred for data sharing.

6. Responsibilities

Who will manage data documentation and metadata during the research project?

N/A

Who will manage data storage and backup during the research project?

N/A

Who will manage data preservation and sharing?

N/A

Who will update and implement this DMP?

Christopher Heng Chiu