Effective separability of virtually nilpotent and polycyclic groups

A Data Management Plan created using DMPonline.be

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Template: KU Leuven BOF-IOF

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Grant number / URL: C14/22/109

ID: 197658

Start date: 01-10-2022

End date: 30-09-2026

Project abstract:
Separability for groups refers to the question which subsets of a group G can be detected in finite quotients. Classically, separability for groups is studied in terms of which of them have a certain separability property, and this question is related to algorithmic problems in groups such as the word problem. A recent perspective (from the last 10 years) on separability tries to study the order of the smallest finite quotient in which one detects the subset under consideration depending on its complexity. In this project, we want to focus on the residually finiteness function for virtually nilpotent and polycyclic groups. For the first class, namely (virtually) nilpotent groups, we want to study whether the residually finiteness function of a nilpotent group is a quasi-isometric invariant. For the second class, namely polycyclic groups that are not virtually nilpotent, we want to improve the lower and upper bounds currently known, making them sharp for at least some special types of polycyclic groups.

Last modified: 10-03-2023

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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.

Dataset name / ID	Description	New or reuse	Digital or Physical data	Data Type	File format	Data volume	Physical volume
Papers	New theorems and examples, with proofs	*New*	D	Textual	.pdf .tex	<1GB	
Computations	Computing certain examples	New	D	textual	.pdf .tex	<1GB	

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:

NA

Are there any ethical issues concerning the creation and/or use of the data (e.g. experiments on humans or animals, dual use)? If so, refer to specific datasets or data types when appropriate and provide the relevant ethical approval number.

- No

Will you process personal data? If so, please refer to specific datasets or data types when appropriate and provide the KU Leuven or UZ Leuven privacy register number (G or S number).

- 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 or 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

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).

The proofs for the theorems we find and the examples illustrating the theorems will all be written in the published papers, which we write in LaTeX and are compiled as a .pdf. The goal of the proofs is that they are understandable on their own, without extra explanation (otherwise the paper will not get accepted).

Will a metadata standard be used to make it easier to find and reuse the data ?
If so, please specify which metadata standard will be used.

If not, please specify which metadata will be created to make the data easier to find and reuse.

- No

There is no relevant metadata standard at our disposal for our field of research.

Data Storage & Back-up during the Research Project

Where will the data be stored?

- OneDrive (KU Leuven)
- Other (specify below)

We will save the papers and examples that we compute on our OneDrive from KU Leuven, but also store them on the ArXiv (www.arxiv.org) where all the papers in mathematics are stored digitally.

How will the data be backed up?

- Standard back-up provided by KU Leuven ICTS for my storage solution
- Other (specify below)

The ArXiv is maintained by Cornell university, so we expect it to be around for the coming years. (It has been since August 14 1991, so for over 30 years.)

Is there currently sufficient storage & backup capacity during the project?

If no or insufficient storage or backup capacities are available, 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?

Access to OneDrive is controlled by the PI, whereas access to the ArXiv is also password protected and personal. Moreover, every change throughout time is visible, so even after a breach we can recover the original data.

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

None

Data Preservation after the end of the Research Project

Which data will be retained for 10 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...).

- All data will be preserved for 10 years according to KU Leuven RDM policy

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

- Shared network drive (J-drive)

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

Costs are covered by the standard services of KU Leuven

Data Sharing and Reuse

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

- Yes, as open data

All the papers (including the computations for the examples) will be made available on the ArXiv.

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

NA

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 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.

- Other data repository (specify below)

As mentioned before, the data will be available on the ArXiv (www.arxiv.org).

When will the data be made available?

- Other (specify below)

Immediately (even as preprint)

Which data usage licenses are you going to provide?

If none, please explain why.

- CC-BY 4.0 (data)

Do you intend to add a persistent identifier (PID) to your dataset(s), e.g. a DOI or accession number? If already available, please provide it here.

- No

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

The costs are carried by Cornell University, the Simons foundation and Stockholm University (as mentioned on ArXiv).

Responsibilities

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

Jonas Deré

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

Jonas Deré

Who will manage data preservation and sharing?

Jonas Deré

Who will update and implement this DMP?

Jonas Deré

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4 of 4