



A repository of graphs and other discrete objects

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- ▶ There are various **censuses** of graphs and other discrete objects in the literature and the internet.
- ▶ We want these objects to be **easily accessible**.
- ▶ Furthermore, we want to have **precomputed properties** that can be used for **searching**.

- ▶ We gather the censuses into a [database](#).
- ▶ The data can be accessed via the website

discretezoo.xyz

- ▶ A [Sage](#) package is also available at

github.com/DiscreteZOO

Where we are now

► Censuses

- All connected **cubic vertex-transitive** graphs with at most **1280** vertices (by P. Potočník, P. Spiga and G. Verret),
- all connected **cubic arc-transitive** graphs with at most **2048** vertices (from the extended Foster census by M. Conder), and
- all **vertex-transitive graphs** with at most **31** vertices (by G. Royle).

► Computed properties

- Basic graph properties (**order**, **degree**, **diameter**, **girth**, ...),
- automorphism group related properties (**vertex-**, **edge-**, **arc-**, **distance-transitivity**),
- some other properties (**is Hamiltonian**, **is Cayley**, **is partial cube**, ...).

Where we are not quite yet

(but we are working on it!)

- ▶ More graphs
- ▶ More precomputed properties
- ▶ Nice **images** of graphs
- ▶ Other combinatorial objects
 - ▶ **Finite groups, polytopes, maniplexes, geometries, automata, lattices, ...**
 - ▶ Feasible **parameter sets** for objects (e.g. distance-regular graphs)
- ▶ **Your wishes?**

Applications

The data from **DiscreteZOO**
has been used in the following research.



T. Marc.

Classification of vertex-transitive cubic partial cubes.
J. Graph Theory, 86(4):406–421, 2017.



P. Potočník and J. Vidali.

Cubic girth-regular graphs of small girth.
Submitted to *Ars Math. Contemp.*



P. Potočník and J. Vidali.

Cubic vertex-transitive graphs of girth six.
To be submitted.

Demo

Notebook available at

github.com/DiscreteZOO/DiscreteZOO-presentations

Questions, ideas?