

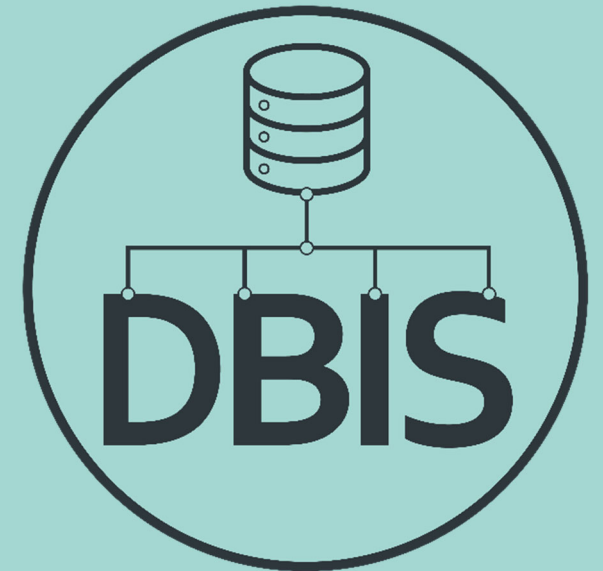


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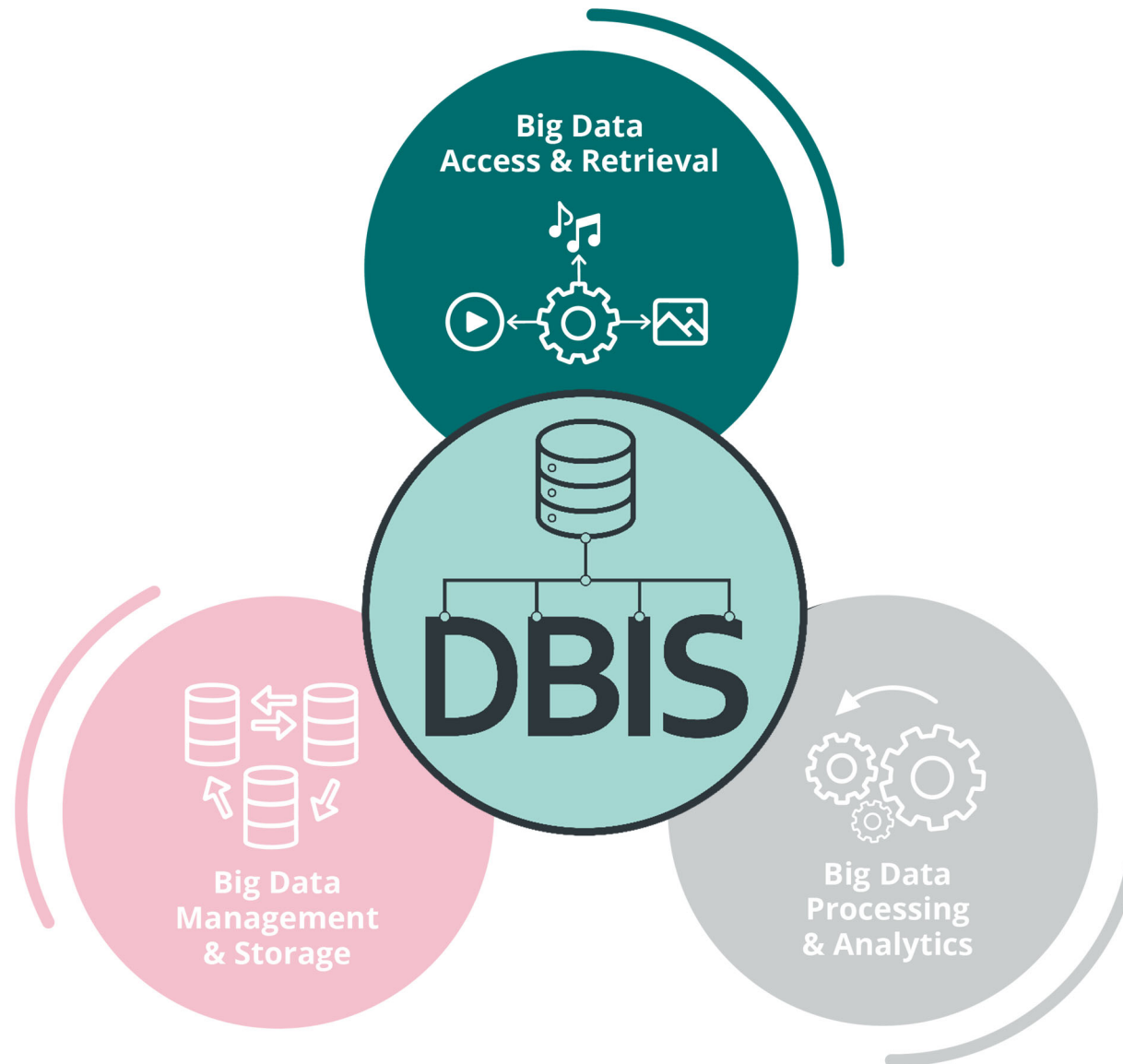
Databases and Information Systems Research Group

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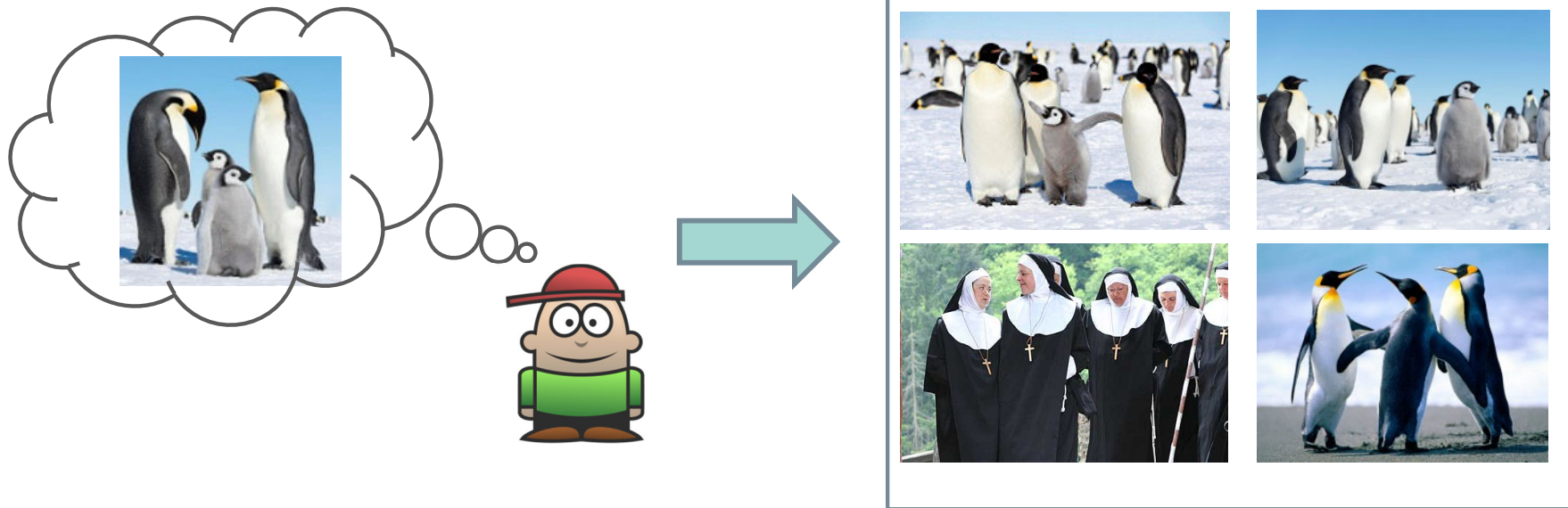
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Multimedia Search with vitivr

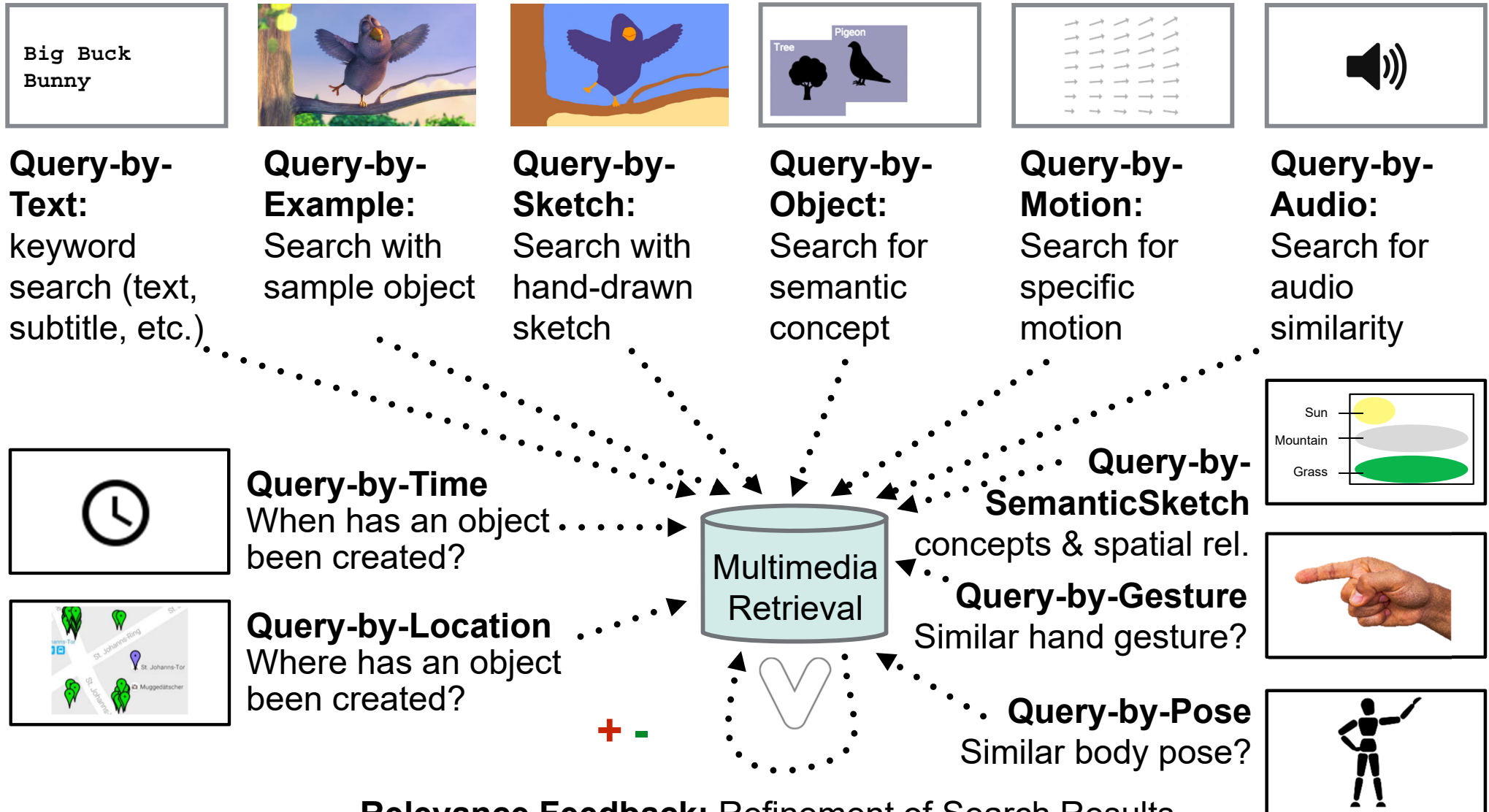
Search in Multimedia Data: Current Approaches

- Keyword Search: Search based on (manually added) textual descriptions
- Query-by-Example: Similarity to query object



Sources: • <http://moviespictures.org>
• Penguins by kyuubidemon98 Michel CC BY-SA 3.0 via <http://kyuubidemon98.deviantart.com/art/penguins-156283137>
• Emperor Penguins by Christopher Michel CC BY-SA 2.0 via flickr -- <https://www.flickr.com/photos/cmichel67/11240231654>,
<https://www.flickr.com/photos/cmichel67/11240225716>, <https://www.flickr.com/photos/cmichel67/11240219084>

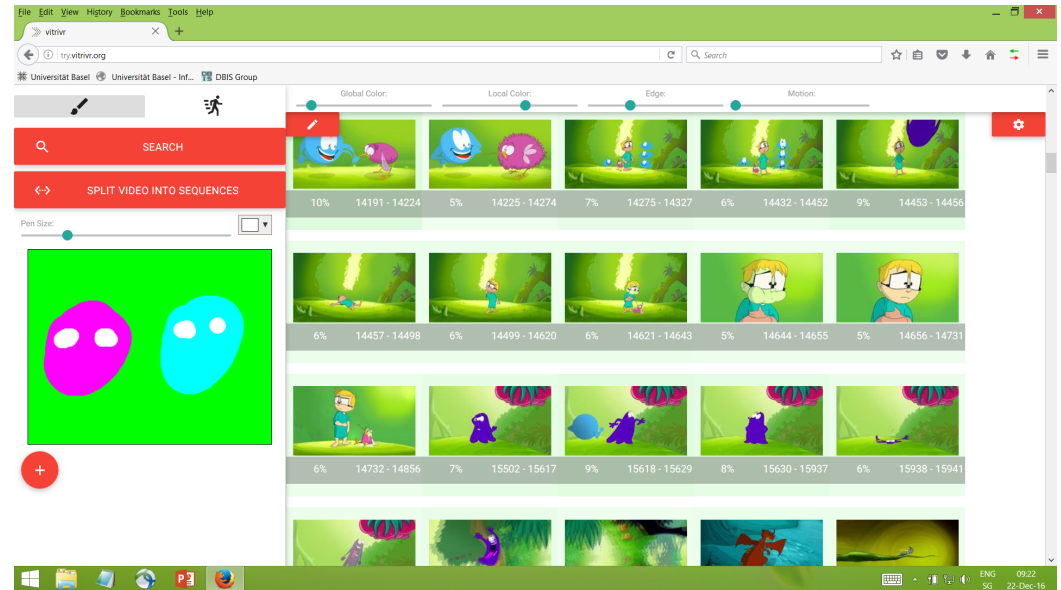
Query Modes in vitrivr



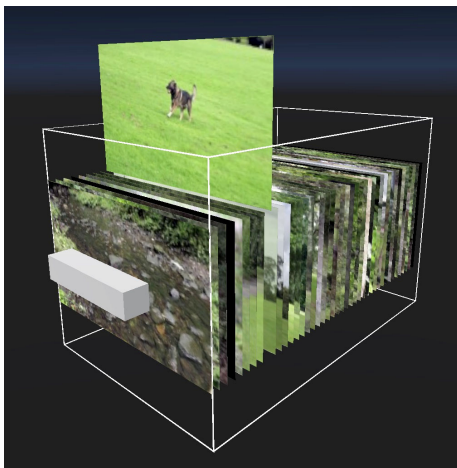
Relevance Feedback: Refinement of Search Results

vitivr: User Interfaces

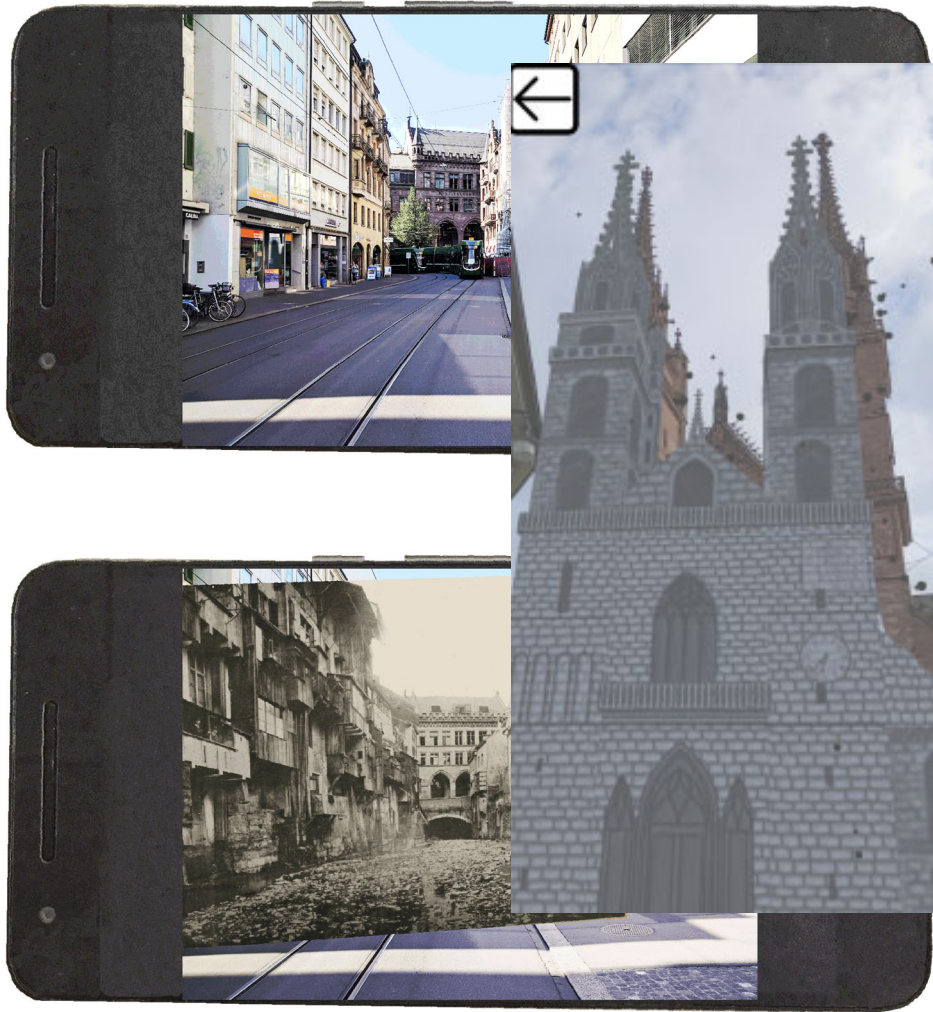
- Traditional 2D desktop UI:



- Virtual Reality Interface



GoFind! Augmented Reality User Interfaces



- GoFind! AR: location-aware augmented reality application for historical images in local context
- Android smart phone application using vitrivr as back-end
- Integration of 3D models



VIRTUE: Museum in Virtual Reality



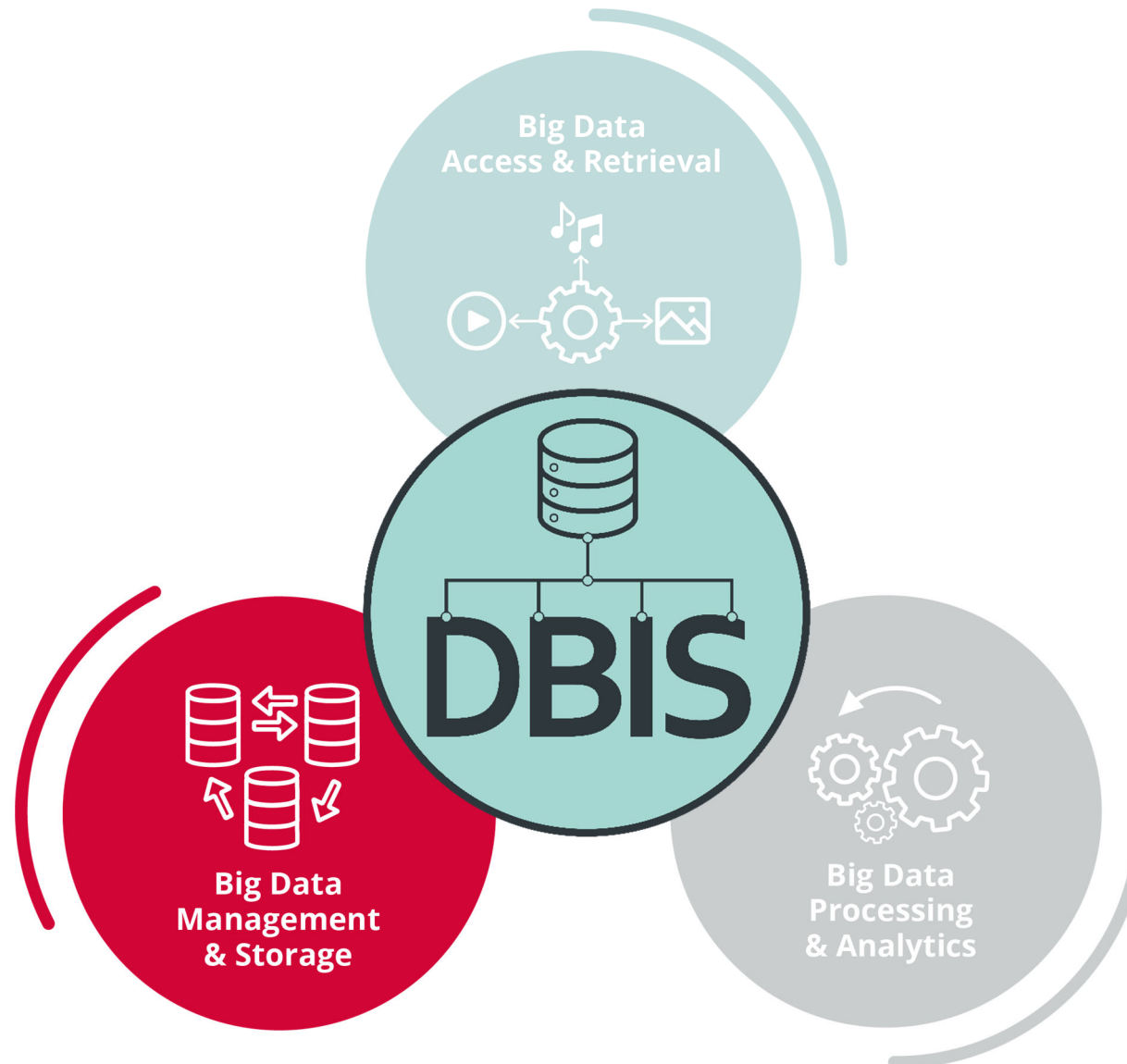
- VIRTUE: 'Walking Around The Globe': prototype for virtual reality art exhibitions
- Currently being extended towards as a front-end for vitrivr to explore novel ways of querying and result exploration
- Has been shown three times at the Basel Museum Night



Available open source at vitivr.org, 3 times at Google Summer of Code

- vitivr backend: CottontailDB – support for novel types in database system
- vitivr search engine: CINEAST – temporal search, additional features
- vitivr: personalization of search
- vitivr-VR: result presentation and relevance feedback in Virtual Reality
- GoFind!: AR and VR interfaces on mobile devices (“smart tourist”)
- VIRTUE: dynamic creation of museum collections based on user profiles
- Similarity search in videos based on body poses (collaboration with Roche)
- Explainable multimedia retrieval (collaboration with partners in EU project)
- Social Media Analytics (collaboration with Political Sciences)
- ... and others

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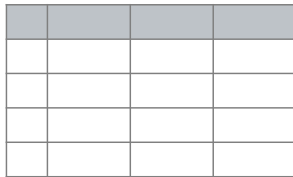


Multi-Model Data Management with Polypheny

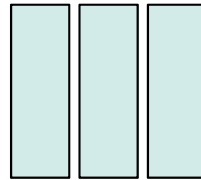


Polypheny

Motivation: One Size Does Not Fit All



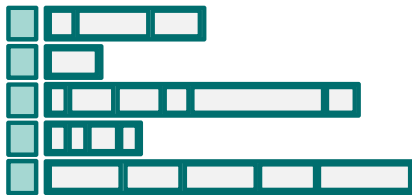
Relational



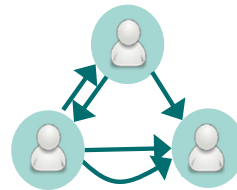
Column



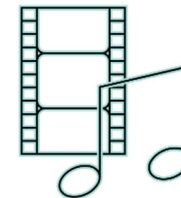
Document



Key-Value

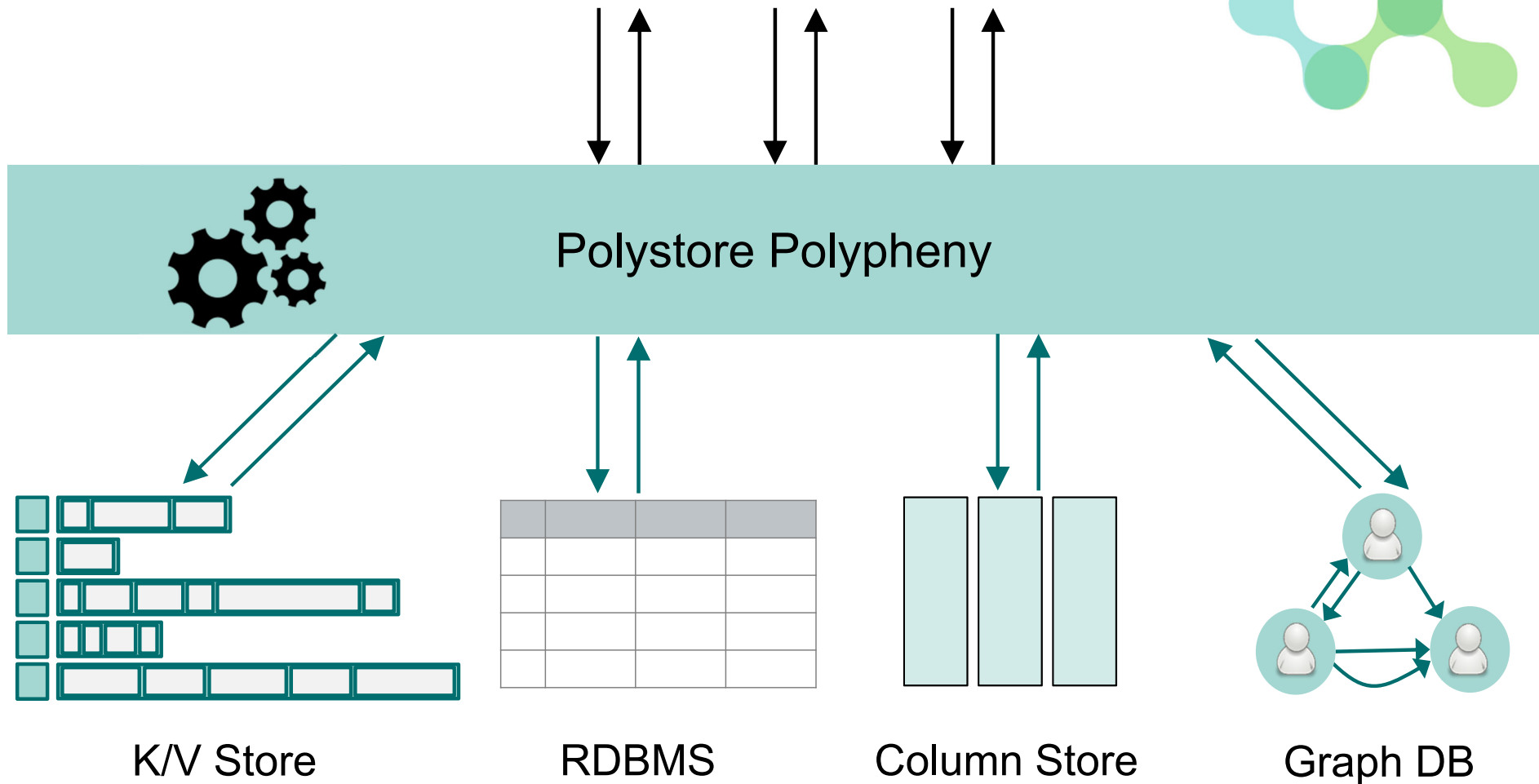


Graph

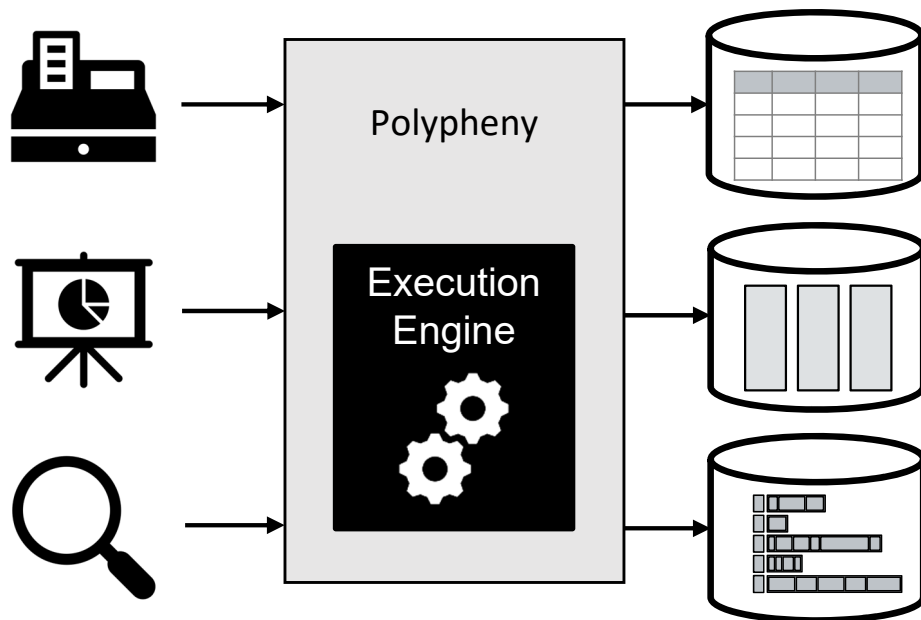


Multimedia

Polypheny: a Distributed Polystore

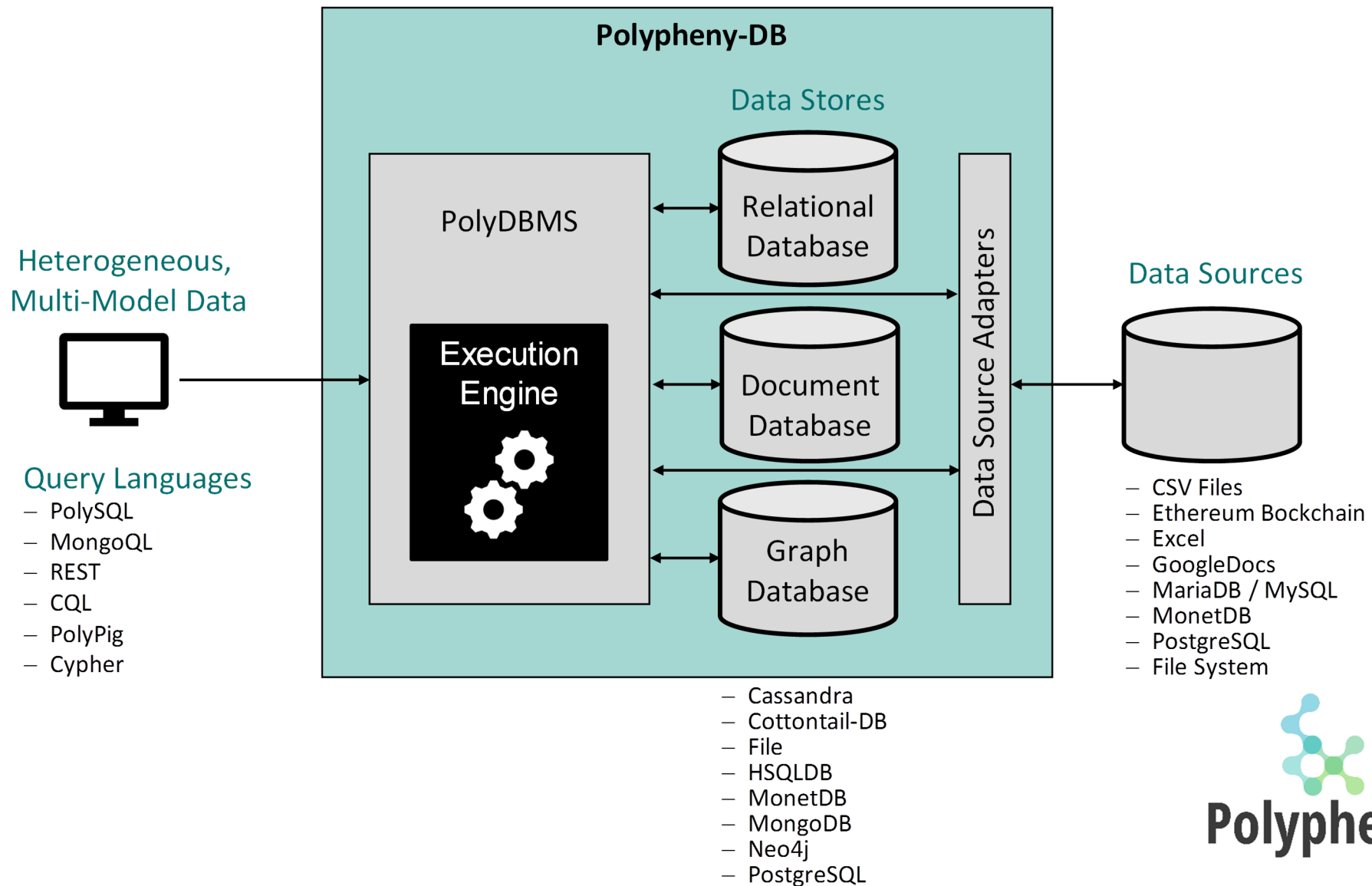


Polypheny



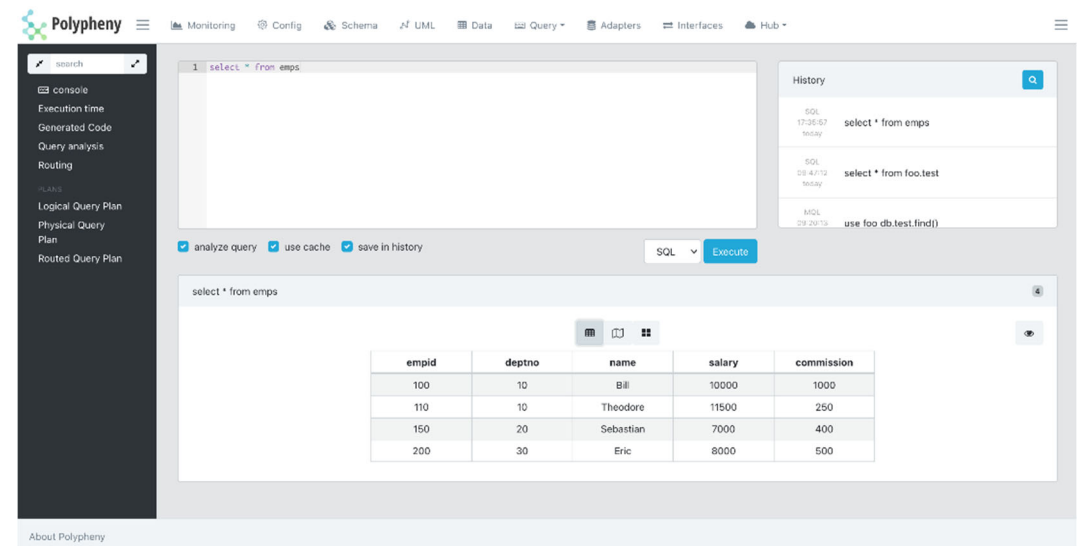
- Using existing database systems as storage and execution engines
- An integrated execution engine that compensates missing features and processes joins
- Utilizes the optimization and domain-knowledge of specialized systems

Multi-Model Data Management with Polypheny



Polypheny

- Open Source (Apache 2 License)
- polypheny.org | [@polypheny](https://twitter.com/polypheny)
- Participated at Google Summer of Code 2021 and 2022



Polypheny: Potential Topics

- Inter-model Queries (different data models)
- Query Routing (learn cost models for store selection)
- Self-adaptiveness
- Additional data sources
- Connectors / drivers for different languages (e.g., Go, PHP, C++, C#,)
- UI for a Polystore (Angular)
- ... and others





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Thank you for your attention!

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