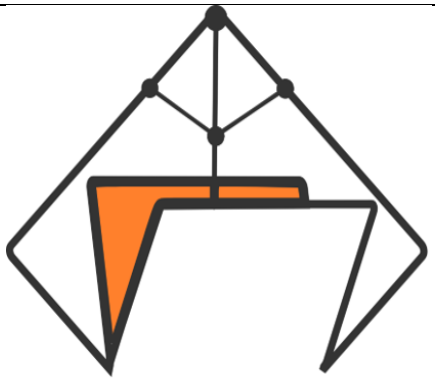
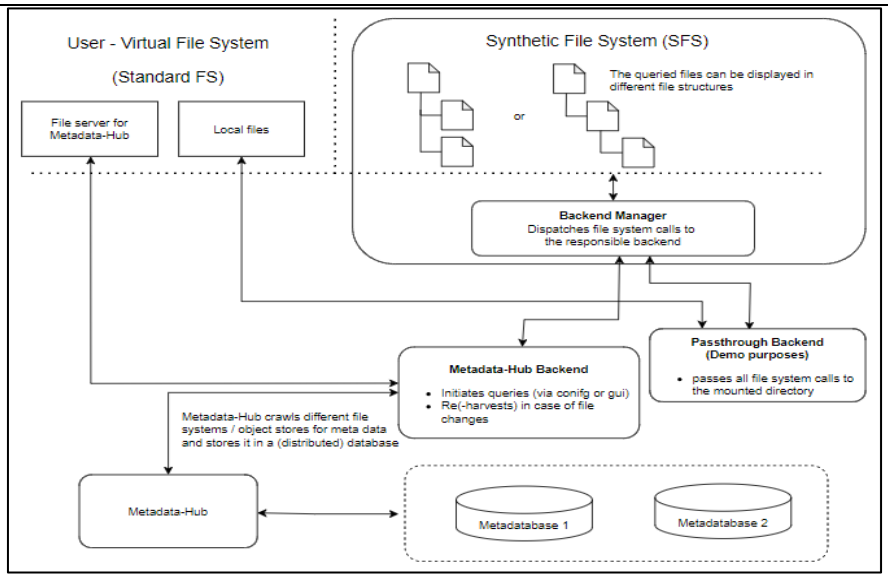
AMOS SS21 Project Synthetic File System

Project Report

Project name	Synthetic File System
Project mission	Due to the current Corona pandemic, as much data as possible is to be analyzed and evaluated with the help of artificial intelligence (AI). This requires central intelligence to collect and interpret all accessible data distributed over several facilities. The key issue is that the data is organized and saved in different systems according to different storage types, structures, formats, and criteria. The task, or rather a mission, is to make the data obtainable or readable via a uniform mechanism within the project timeframe. This would have the benefit of not having to adapt each application to the different memory types. The synthetic file system is a so-called adapter for each type of memory so that a unified namespace can be formed from it.
Industry partner	GRAU DATA Gmbh
Team logo	 *Figure a: The SFS team logo*
Project summary	The Synthetic File System (SFS) makes use of a Virtual File System (VFS) combined with File System in Userspace (FUSE), which provides a unified view of data at a file system level from multiple data sources such as MetaDataHub and a Passthrough system. The files can also be filtered based on their metadata and consecutively viewed either as a mirror image of the original directory structure or a flat hierarchy.

Project illustration	 *Figure b: The SFS software architecture* The SFS architecture implements multiple data sources to extract data based on file metadata. The user can choose the data source from which the data is to be extracted; in this case, the options are between MetaDataHub and a Passthrough backend system. The MetaDataHub is an application that crawls the filesystem for its metadata and stores it in a database. The Passthrough system represents a path on a local machine. The Backend Manager routes this request to the respective backend, which filters the data based on the request and routes the results back to the user via the Backend Manager. The final data can be viewed as a mirrored file system's structure or as a flat hierarchical structure under the specified mount point in the configuration file.
Project repository	https://github.com/amosproj/amos-ss2021-synthetic-file-system
Additional information	Members of the AMOS SFS team expressed great interest in the developments of the project and its prospect and enjoyed a cordial relationship with the industry partner, GRAU DATA Gmbh. A first get-together to evaluate the future of the project has already been planned.