



Whitepaper Poi3D

a portal for 3D model-based information exchange and asynchronous collaboration

<https://www.poi3d.com>

Vision:

Our goal is to significantly facilitate collaboration between companies or people in a technical environment by providing a web portal with 3D support.

In addition to that, we want to create the prerequisites for the realization of a digital twin by providing all the necessary data for the operation and maintenance of a machine, a facility, or a building.

Furthermore, we want to give retailers the opportunity to interact better with their customers by easily defining product catalogs.

We do this by providing the required information based on 2D/3D documents on the one hand and, on the other hand, enabling communication between users that takes place in a controlled environment in the form of working groups.

The focus hereby is on making the software easy to use and on protecting the data and the communication against unauthorized access, as well as ensuring the user is as independent as possible.

Functions:

With Poi3d.com you can:

- Upload and share 3D models from CAD formats with other users.
There is no need to install additional software, users can access the 3D models directly in the web browser.
We support standard CAD formats like Step®, 3DXML® and JT® as well as the BIM format IFC®. In addition to that 3D meshes from the formats OBJ, STL, 3DS, GLB and GLTF can be imported.
- Upload and share 2D documents with other users.
We support 2D PDF, Multipage Tiff, and all common image formats.
- Create work groups to access the documents and 3D models.
Only users which are part of a work group have access to the uploaded documents.
- Add annotations to the documents and models to support an information exchange which is based on specific parts of the model.
We can create image and text annotations, highlighted areas and information points which references to external web sites. In addition to that there is a possibility to label 3D models or 2D documents.
- Add 3D positions in a virtual reality environment to identify specific locations.
Architects and plant designers can provide viewing points to their customers to give a visual impression or show the location of specific components.
- Add 3D models into an augmented reality environment to enable a visualization of their appearance in the real world.
- Measure 2D and 3D documents
- Add instructions to 3D models to facilitate maintenance work.
- Compare two 3D models to show structural and geometric differences.
- Assign materials.
Product managers and designers can assign materials to 3D components to coordinate the design in advance.
- Attach files.
Any number of additional files can be stored alongside the saved documents.
This is useful for attaching additional documents such as protocols, drawings, calculations, etc. to a main document.
- Define and transfer engineering bill of materials
Any number of engineering BOMs can be defined for a 3D model. These can be structurally changed, renumbered, and enriched with attributes.
The generated parts lists can either be saved as HTML or PDF files, or transferred to other systems such as ERP or PDM systems via a generalized, cloud-based interface.
- Add sensor data.
Sensor values such as temperature, pressure, etc. can be queried and displayed as labels in the 3D model or in the PDF document/photo to provide additional information, for example for home automation or in the context of a digital twin.
In addition to directly querying the values via web standards, there are adapters to the Azure IoT Hub and AWS IoT Core to retrieve sensor values from these IoT platforms.

- Communicate document-related within a work group via chat, video, and email
- Configure any number of AI bots with different language models and include them in the chat discussion
- Generate product catalogs
Product catalogs can be created from the information stored in the portal and made available either to all users of the portal or worldwide.
- Define additional document attributes
In addition to the metadata available in the model, additional attributes can be defined and assigned to the main document and all subcomponents.
- Operate your own messaging service similar to WhatsApp®
The included web app "**Poi3d TalkFlow**" supports communication with AI models, group chats with image elements, file sharing, as well as video, telephone, and email communication with other portal users.
Besides running it in a browser, it can also be installed as an app on mobile devices.

Advantages:

- **Security**
The uploaded models are only available to the owner and members of the corresponding workgroups. Access to the models by unauthorized persons is prevented.
Your know-how is protected because only representations of the 3D models are used in the portal. The original data stays in your hands.
The portal was developed with "Privacy by design" in mind and does not use cookies. To register, you only must provide the information required for operation.
In addition, it is possible to encrypt both the communication between browser and server as well as the document attachments (chat, comments, instructions, material assignments, ...) and thus protect them from unauthorized access.
- **Performance**
Due to the small file size, the models are loaded very quickly despite of the high resolution and are displayed with a high level of detail.
Special performance optimizations also enable the handling of large models with several thousand components.
- **Simplicity**
The software is very easy to use and is intuitive to the user.
Collaboration with other users can therefore take place without special training.
- **Mobility**
The portal is also designed for access with mobile devices.
You can use the full range of functions on the go and, for example, include photos of the current location in the discussion.
- **Accessibility**
There is no need to integrate or install expensive special applications.
The functions are available ad hoc on almost any hardware without installation.

- **Independency**

In addition to using our portal poi3d-portal.com, we provide individual installations as hosting. This allows the permitted users to be defined by the respective customer.

It is also possible to operate the portal yourself. This means the customer has complete control over the system and is completely independent.

Areas of application

- Engineers who want to discuss their design with external or internal partners.
- Architects who want to give their customers an impression of the building.
- Plant designers who want to provide the design to their clients during development.
- Manufacturers who want to facilitate assembling at the customer's site.
- Booth builders who want to provide documents and models to their colleagues during the installation.
- Designers and product managers who want to exchange ideas about the design of the product.
- Measurement technicians who compare 3D scans of the measuring machines with the construction models in 3D and want to discuss them with their partners
- Operators of 3D printers who want to define the printing model based on an STL file and coordinate the information necessary for printing with others.
- Mold makers who want to exchange data such as CAD models, 3D scans, measurement reports, drawings or offers with their customers on a project-specific basis.
- Operators of facilities who want to monitor sensor data in the context of a 3D model or a PDF document
- Workshops that want to coordinate their orders with their customers based on 3D models or 2D PDF files.
- Any company that wants to discuss the content of PDF documents with its customers and at the same time retain full control over the data, as it does not have to be transferred to an external storage.
- Any company that wants to provide its customers with a 3D model-based digital representation of the delivered product to organize, for example, maintenance processes or spare parts orders
- Any company that wants to establish a model and document-based collaboration with its suppliers in a controlled environment.
- Any company that wants to operate its own, fully controlled communication with employees and partners in the form of a messenger service.

Operations/Hosting

- Free account at poi3d-portal.com including three documents and one working group.
- Provision of an individual instance for your company (hosted by us at the address mypoi3d.com) in which you have control over the users.
- Country-specific provision of the portal to take local legislation into account.
- The portal as an extension of your own software infrastructure or website, hosted by you, which can be operated free of charge with two users and one administrator. It can be downloaded at <https://mypoi3d.com>

Integration into third-party applications

The portal can be integrated into Windows applications using Nuget packages. Hereby Windows Forms and WPF applications are supported.

The Nuget packages Cadmai.Poi3dPlugin.WpfControl and Cadmai.Poi3dPlugin.WinFormsControl can be downloaded and used free of charge from nuget.org.

Integration into existing websites is achieved using an iFrame in which the portal is loaded. The main page can then communicate with it via an integrated API.

An example can be found at <https://mypoi3d.com/IframeIntegration.html>

Windows Client

The Poi3D Windows Client integrates the portal into an own Windows application, providing portal functionality both locally on the computer and online.

It allows to add attachments to documents, whether in the form of 2D files or 3D models.

For example, annotations to PDF or image files or display sensor values, such as those from home automation can be added.

In the 3D area, you can also design surfaces, define instructions, and create parts lists.

The Windows Client can be downloaded from <https://mypoi3d.com>.