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| “How can the information available in BIM models can be used by robots for their autonomous navigation?” This project will investigate the use of BIM models in the construction industry to improve the localization of robots during autonomous navigation. The project aims to extract geometric, semantic, and topological information from architectural plans, and use this information to create the topological and metric-semantic layer of the Situational Graphs (S-Graphs) to aid in robot localization. | The aim of this technical project is to extract information from building architectural plans and create a 3D Situational-Graph (S-Graph) in an automated manner. To accomplish this goal, we will use Python and C++ programming languages and the Robot Operating System (ROS). Our tasks include exploring the ifcplusplus library to extract useful information autonomously and calculating the starting point of the second wall surface of each wall, extracting the normal orientation of each wall surface, and the connectivity information of all walls of the building. We will then create and publish the Situational-Graph (S-Graph) over ROS from the extracted information in an automated manner. To extract the required information, we will use Dynamo for Revit to extract information directly from the Revit Model, BimVision for coordinates of wall surface, doors, and windows, and ifcplusplus to extract the connectivity information and orientation of walls. |