Design Applications of CADFind3D

Design Reuse 

Design re-use is commonly associated with standard components such as fasteners, spring pins etc. and the proliferation of such parts can be controlled by the implementation of preferred item catalogues, whether manual or computerised. Computerised versions which form part of CAD systems go beyond making the catalogue easy to access by also providing CAD models of the components which can then be inserted into the model as required. To help find suitable parts the standard components are parameterised, for example the parameters for fasteners might be thread size, head type, thread length etc. More than this, some systems actually prevent the designer from using components which are not in the catalogue.

However strict this approach, it is ineffective for the many company specific parts e.g. clips, brackets, spacers and pins which, whilst common, are not easily standardised or parameterised. There are many stories of new components being designed when one already existed which would do the job. Before long there are a number of components, all slightly different, but performing essentially the same task. Each component has its own (different) part number, process route, stock policy, spares record etc. Hence, more significant than the design time are these inevitable downstream activities associated with each component that is designed.

CADFind3D searches by finding matches on the size and shape of the 3D part and will produce matches even when the parts are not exactly identical. This is because CADFind3D calculates a similarity 'index' for all the matches and then lists the parts in order of similarity. That means parts may be found that when modified will suit the application at hand.

CADFind3D is quick and easy to use. Load a part into your CAD system & click 'search'.

CADFind3D can search 50,000 parts in less than 5 seconds!

The economic case for design reuse is overwhelming. A US Department of Defense Standardization Program estimated that re-use of existing parts would save $20,000 each time a new design was avoided, or $33,000 if new manufacturing tooling was required for the part. Another American study

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found that 20% of parts could be re-used unmodified and that another 18% could be used with some modification.

This means that the potential for operational savings is huge. Even applying the lower (20%) figure to a company that creates 6000 new parts a year would mean that 1200 of them were unnecessary. Furthermore, even if the Department of Defense costs were over stated by a factor of 1000%, savings of 1200 x $2000 = $2.4M would be made per year.

Standardization 

Over time new designs are continually added to a company's parts repository even when it may have been possible to re-use an existing design. Design proliferation may occur because the designer was unable to locate a suitable part at the time it was needed or they may simply have failed to look properly. Over many years this may mean that the company's database contains a large number of very similar parts.

Standardization usually involves visual inspection of the company's drawings or 3D models. Manual comparison methods are very slow, error prone and inevitably expensive - so much so that few companies attempt the process of rationalisation at all. Although research systems (and a few commercial) systems offer clustering of similar parts, few of these have been designed specifically for this task.

CADFind3D's research-based technology led to the release of the first commercial system in the world to allow user's to find their CAD drawings and models using graphical, shape-based retrieval. CADFind3D Pro can automatically identify groups of duplicate parts once the user can set the level of 'similarity' required.

CADFind3D interfaces directly with SOLIDWORKS so that users can determine whether duplicate parts can be eliminated directly or whether modifications are required to create new composite parts to replace each group of duplicates.

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