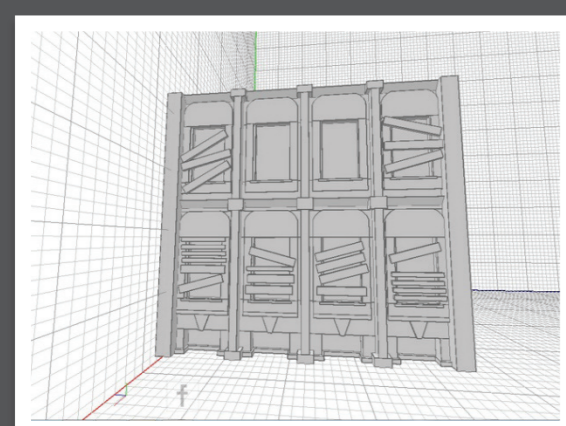
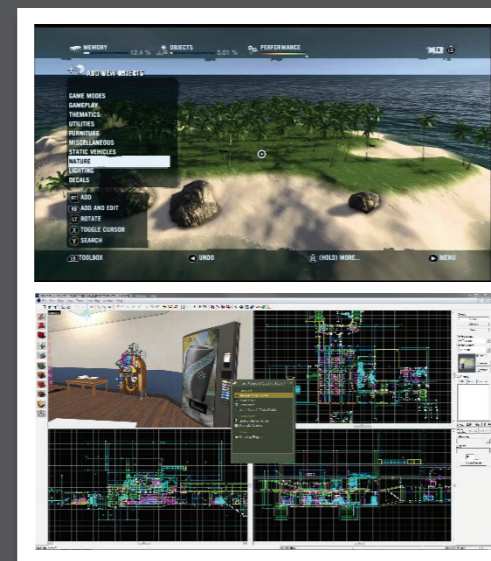


Why write an editor?

Modern computer games often come packaged with development tools so that players can make their own content. Unfortunately, these can be poorly maintained and are frequently closed-source and inflexible.



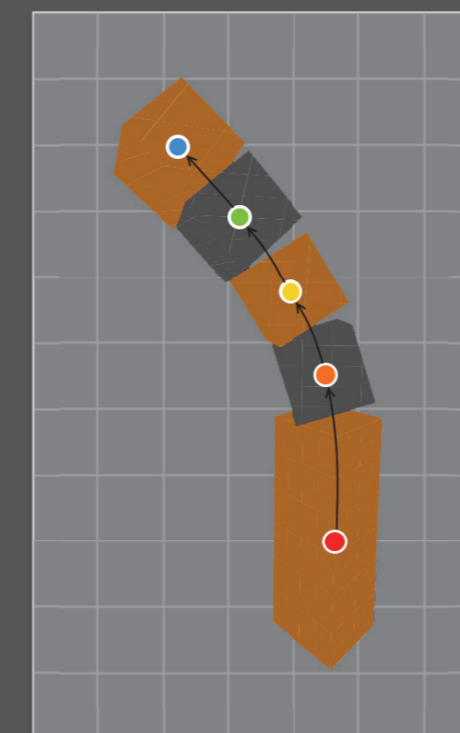
Third-party editors exist, with varying feature sets. Some attempt to make modern tools available for use with older games; others aim for better immersion within the 3D world.

With these considerations in mind, we identified some over-arching goals of an improved level editor:

- To keep user focus on tasks relevant to the player experience, and automate the required low-level operations.
- To be run on multiple desktop platforms.
- To accelerate the speed at which maps can be developed.

What does Crowbar do?

Due to time constraints, we chose to implement a prototype with basic functionality and that focused on hierarchies of objects. Child objects are positioned relative to a parent object, and inherit the parent's transformations.



This gives a number of advantages:

- Geometry rotated at arbitrary angles can be manipulated in its own co-ordinate space.
- Floating point rounding errors do not accumulate after many transformations.
- Multiple objects can be grouped under a parent and transformed as one.

Object hierarchies are intended to provide the foundation for automation steps later on – if an operation should be applied uniformly to a group of objects, it makes sense to treat them as children.

The prototype is also able to export to the VMF file format, in order for maps to be compiled for and tested with Source engine games.

Future development

Pending CSE department approval, Crowbar should continue as a free, open-source editor into the future, helping to break dependencies on game publishers for tool updates and fixes.

Some future improvements to the editor would be to provide support for all stages of the content creation process, including version control and managing custom assets. The automation philosophy could also be utilised for powerful and intelligent tools, such as the ability to define the initial layout of a map with a flexible node- and path-based topology. All of these additions would help users to accomplish complex tasks more quickly, giving more time for testing and hopefully providing more fun when playing.



The full project code will be made available at the following address:

<https://github.com/x6herbius/crowbar>