PROPOSALS FOR BETTER SNAPPING AND PRECISION (CAD) MODELING

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1D_Scripts toolset - collection of concepts of tools, written during research of how Blender's CAD/Precision modeling and snapping can be improved upon production's demand.  https://blenderartists.org/t/1d-scripts-bargool-1d-tools-main-thread/668937
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1.0 - PRIORITIZED ITEMS:

1.1 - New Snap Options “Middle” and “Perpendicular”:

1.1.1 - Middle: Snap to the middle of the edges;
1.1.2 - Perpendicular: Known the initial coordinate of the movement, this option makes the snap to the nearest point in an edge making a perpendicular angle (90º);

Nice options! Middle may also have support for faces centers.

1.2 - Implements “Edges” option to the “AutoMerge Editing” option:

Currently this option only works to merge vertices, but it would be a good addition to also split and merge an edge, since it currently takes many steps to achieve the same result.

Concept is not quite clean, since merging edges is merging it's vertices. Sounds like sewing, but sewing have no deal with snaps.

1.3 - Improve the snap when movement is affected by a constraint:

When a point is moved to a specific direction and the snap point is performed on an edge or face, the final snap should be made at the intersection of the direction vector with the face or the edge. Currently the final snap is performed on the point closest to the current position pointed by the mouse cursor on the edge or face. The Snap for edge and vertex slide fits into this point.

Corner tool was written in attempt to solve that issue, it allows lengthen multiple edges to active edge using 2 types of projections (top projection / default python intersect), can be interesting as draft realization of such concept.

Projection to face concept failed to be solved by me.

1.4 - Transform tools performed over a base point.

This feature would only be available if the snap is enabled. Since in Blender 2.80 we have the support of Gizmos in the tool system, it would be good to indicate and allow the user to choose more intuitively where the “Target” (motion pivot) starts. Currently, the user has to click on a random point of the screen to perform the transform. And the “Target” is set along with the snap options in an unmanageable way.

Nice proposal of basepoint concept  https://developer.blender.org/T45734

Also, Alignment tool proposal based on custom ruler-type gizmo  https://developer.blender.org/T45734#506696

Some 2.79 concept/research realizations in that area:

Sideshift (currently used for basepoint grabbing substitute)  https://www.youtube.com/watch?v=KxMXGVmA1cE

3Dmatch (3-point alignment tool based on wiremesh keys transfer)  https://www.youtube.com/watch?v=gfnX5MYXNfk

3DRotor/Scaler (rotates/scales/instances around point and with values and direction stored by single wiremesh key)

1.5 - The Knife tool snap should match the snap options enabled:

This will also take advantage of the new Middle and Perpendicular options. However the snap options for edges and vertices will always be enabled in this tool to avoid discontentment due to muscle memory of long-term users.

Nice, also interested in snap ability for Bisect tool.

Also – Polycross tool concept demo  https://www.youtube.com/watch?v=xS7KMHdms7U

Also – Extend Cross tool allows subdivide multiple edges at projection intersection points (also with 2 intersection types).

2.0 - ITEMS FOR SECOND EVALUATION:

2.1 - Grip Snap in Perpendicular View should be made to grid at ground level:

Generally you are not sure which grid point the object is in the perspective view because you need to consider the current depth of the object on the screen.

Basically, axis/plane restriction is property of entire snapping system depending on view mode.

In different software there is ability to set 2D / 2.5D / 3D snap modes, that restricts snapping parallel to grid plane from any view (2D) or with restriction in ortho view, without restriction in any other view, including User ortho (2,5D).

Very useful, solves problem.

3.0 - ITEMS FOR DISCUSSION:

3.1 - Allow navigation while transforming:

Currently this brings conflicts with the current keymap.

Current static behaviour is not critical, and even pretty much nice (working with 50 km2 areas with precision of doorhandle)

3.2 - Change the current form of incremental snap:

The incremental Snap is made on a kind of grid with offset and not over the distance from the origin point.

Indeed, increment snap needs to have separate direct distance+rotation angle values, independent from grid display/settings in any way, as far as it supports local transforms.

3.3 CAD tools / adaptations

3.3.1 Offset edges tool.

3.3.2 Keymap – ability to Switch GX and GOX order because local transforms are used more often in a wide range of applications, such as historic restoration.

3.4 CAD-Snap unit test scene

Blend scene with most popular geometric situations, causes problems with current CAD/snap Blender realizations, for practical solutions testing.