Introduction

- The presentation of 3D spatial parcels and the development of spatial data visualization models play an important role in establishing the "**future 3D cadastre**".
- Since there is no **3D-GIS** yet, an "**intermediate semi 3D system**" must be established in order to take the control of managing the 3D cadastral data.

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Constructive Solid Geometry as the Basis of 3D Future Cadastre

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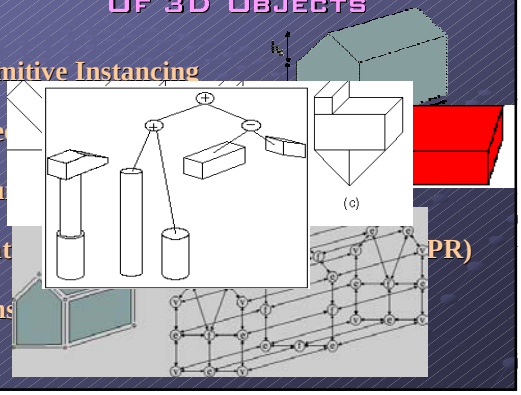
Considerations In Developing 3D Cadastre Visualization Models

- The model proposed takes into consideration a number of practical aspects:
  - **3D** cadastral **registration methods**.
  - **3D spatial topology** in the future 3D-GIS.
  - **Accuracy** of cadastral constraints.
  - **Feasibility** of the database's application in existing CAD software.
  - Effectiveness in building 3D city models in the future cadastre for city planning purposes.

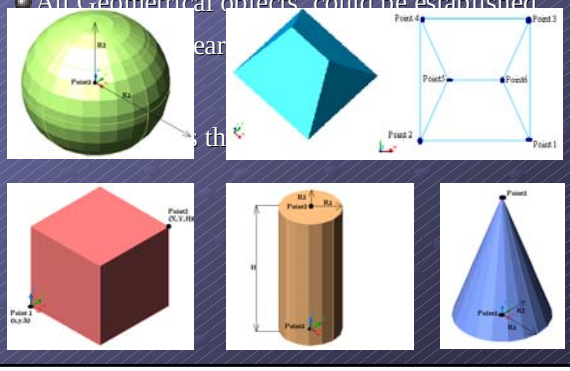
Valid Models For Visualization Of 3D Objects

- **Primitive Instancing**
- **Swe**
- **Bou**
- **Spat** **PR)**
- **Cons**



The Proposed Method

- All Geometrical objects could be established ear th

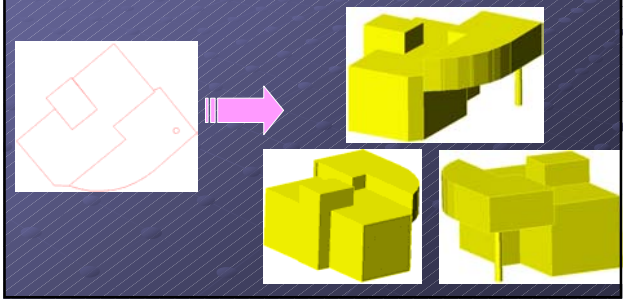


The Proposed Method

- Two models are protruded: **B-reps** & **CSG**.
- **CSG** main disadvantage is its poor ability to produce **3D topology**.
- Till now there is no **final model for 3D topology**.
- The important character is the possibility of the model to be converted to any other one → **CSG** is better than b-reps.

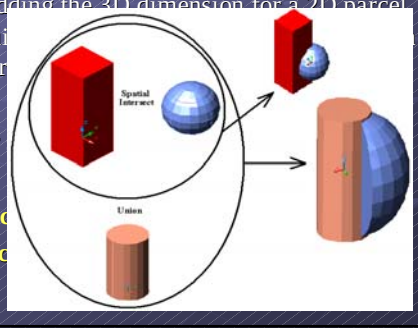
The Proposed Method

- An example for the **Sweep representation** model as one of the **CSG** primitives:



The Proposed Method

- Additionally the **Sweep Representations** Model is vital for adding the 3D dimension for a 2D parcel and 2D bui
  the ordinar
- The linear
  - **Union**
  - **Intersec**
  - **Subtrac**
  - **Slicing**



Development Of Alpha-Numeric Data Format For Saving The 3D Spatial Measured Data

- The main advantage of the proposed alpha-numeric cadastral data format in Israel→ It continues the existed 2D cadastral data format.
- More details about the "**3D Alpha-Numeric**" could be found in the paper.

Development Of Alpha-Numeric Data Format For Saving The 3D Spatial Measured Data

- 3D alpha-numeric data format is needed in the 3D future cadastre order to:
  - Semi-automatic production and automatic 3D representations.
  - Conversion to the future 3D GIS.
  - Preparation of the 3D Cadastral data for the 2D GIS system.
  - 3D visualization and 3D City Models executions.
  - 3D reparcelation planning map preparing.

Conclusion

- The proposed Method advantage
  - → simplicity and its effectiveness.
  - → It Fulfills the needs of any proposed registration model.
- It is simple to be converted to any other model format such like b-reps. Even 2D projection format → managing by 2D-GIS.
- Its main disadvantage → enable to produce **3D topology** directly.

Experimentation

- By ral