REACT: Real-time Efficient Attribute Clustering and Transfer for Updatable 3D Scene Graph

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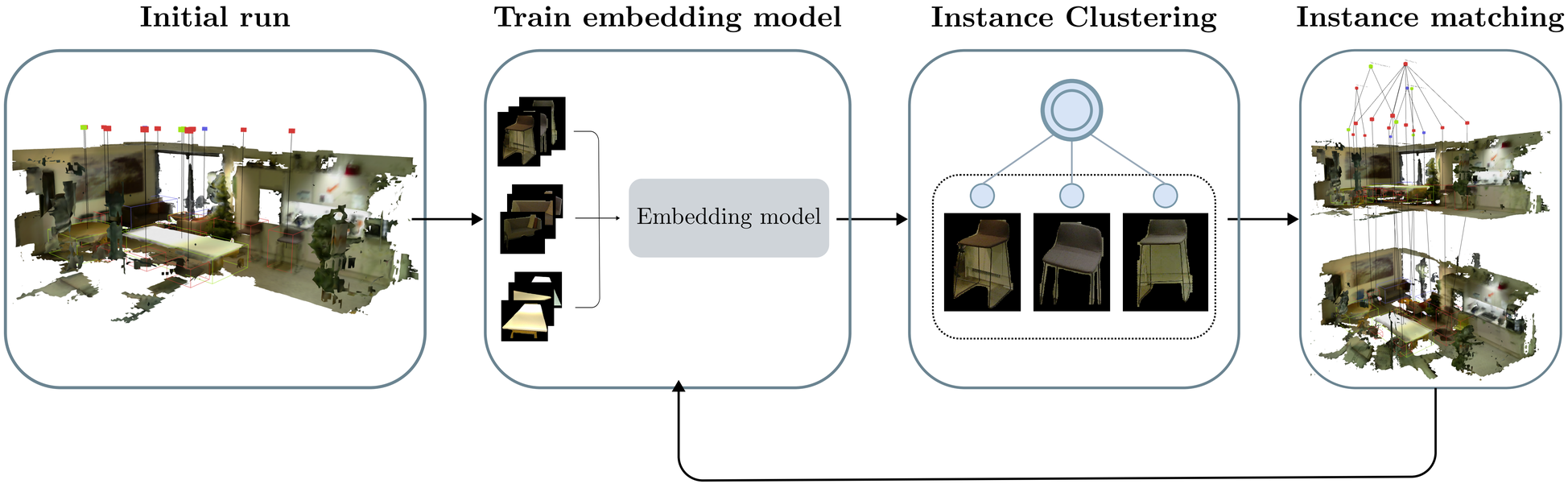
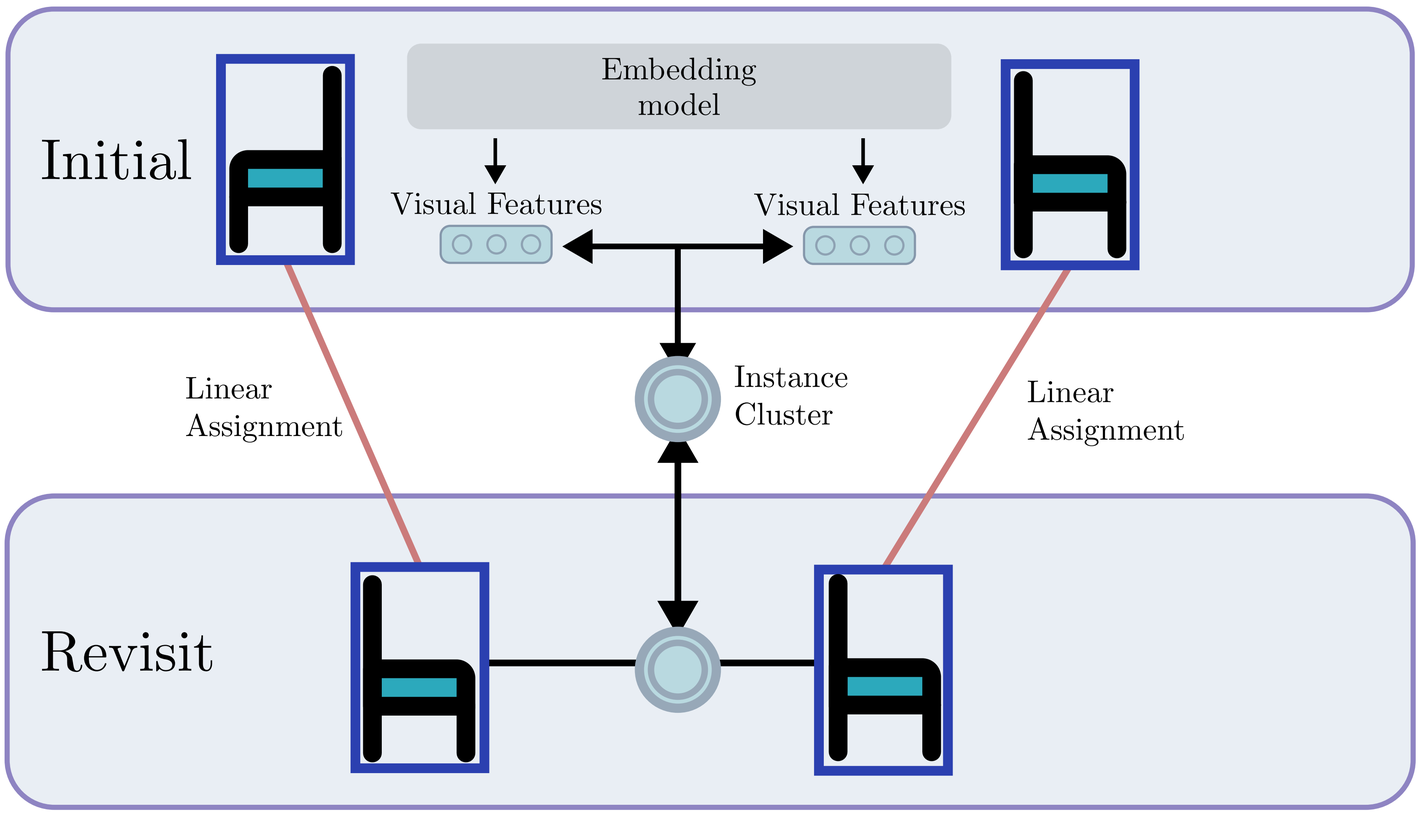
Abstract

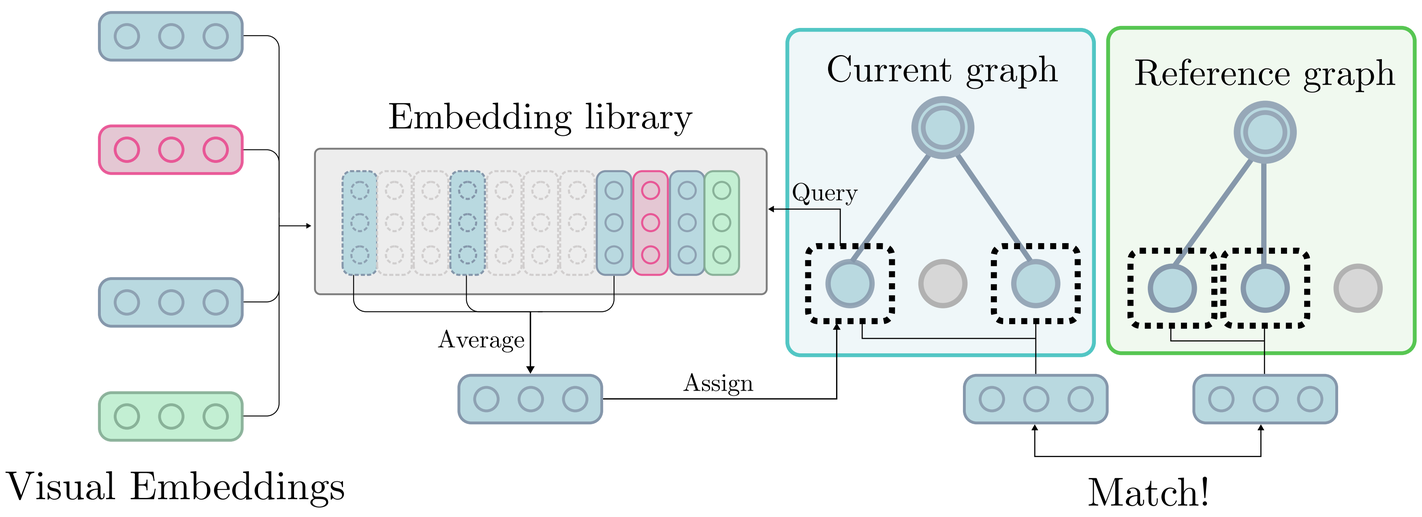
We propose **REACT**, a method to efficiently **update** object nodes in a 3D scene graph (3DSG) in **real-time** by leveraging computationally efficient visual features. In this work, we pursue two objectives. Firstly, we aim to **cluster identical object instances** to facilitate attribute sharing among multiple object nodes within a 3DSG. Secondly, we tackle the challenge of **instance matching** in long-term, semi-static scenarios.



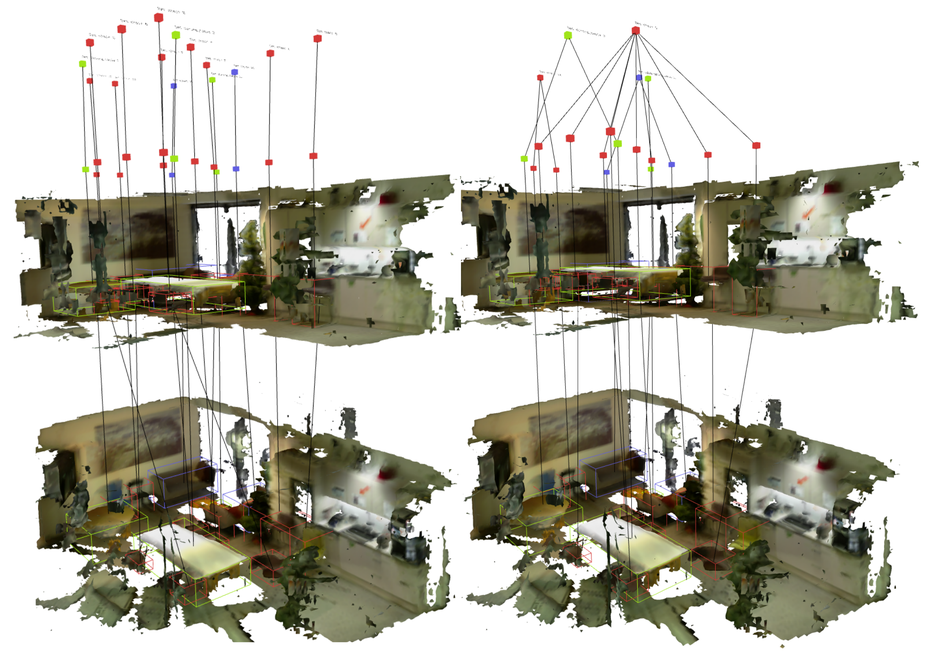
Attribute Clustering and Transfer



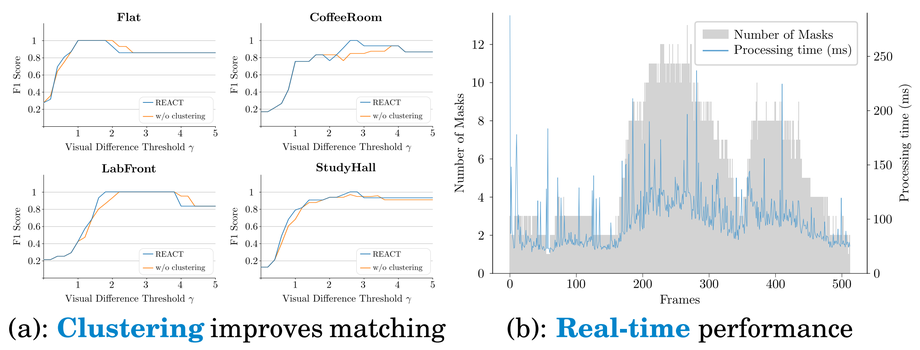
Online instance matching



Experimental results



without clustering **REACT**



(a): **Clustering** improves matching (b): **Real-time** performance

Conclusions

We presented REACT to:

- **Cluster** object instances and share attributes.
- **Updates** object nodes in a 3DSG based on visual appearances in **real-time**.

REACT paves the way for:

- **Reusable and adaptable** 3D scene graphs.
- Real-time attribute **transfering of computationally expensive features** (e.g., visual-language features).

This work was supported by the Research Council of Finland (decision 354909).