

VisiFit: Structuring Iterative Improvement for Novice Designers

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MOTIVATION

- We present VisiFit, a computational design system that helps users create improved versions of visual blends.
- Visual blends are an advanced graphic design technique where two objects are combined seamlessly and aesthetically into one visual to convey a new meaning.
- VisiFit helps novices by structuring the iterative process along 3 fundamental dimensions: shape, color, and internal details.



Figure 1. An example showing how VisiFit improves a visual blend prototype in < 4 min.

METHODS

Design Principles behind VisiFit:

- Structure the problem into subtasks and provide interactive tools specific to each subtask.
- Identify **fundamental dimensions** to structure the iteration process. For visual blends, these fundamental dimensions are **silhouette, colors, and internal details**.
- Provide high-level tools related to the fundamental dimensions that can preview results without requiring expert knowledge or tedious, low-level manipulation.

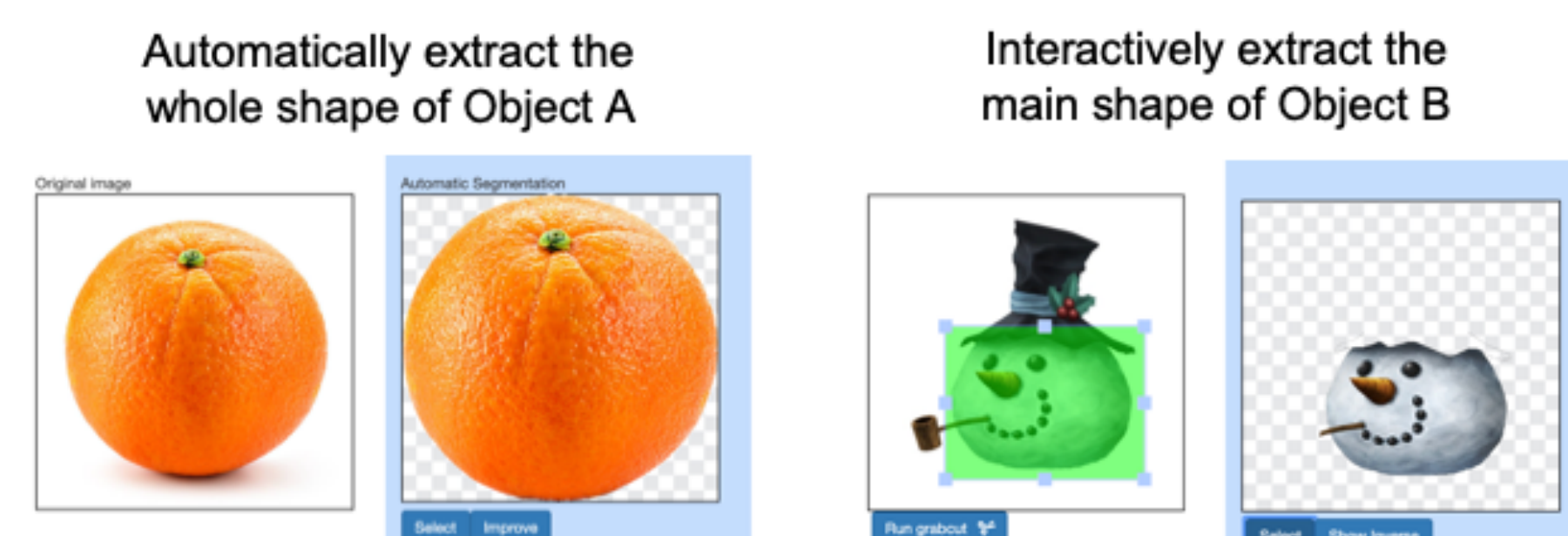
Figure 2. The five steps of the VisiFit system is shown on the right.

VisiFit provides:

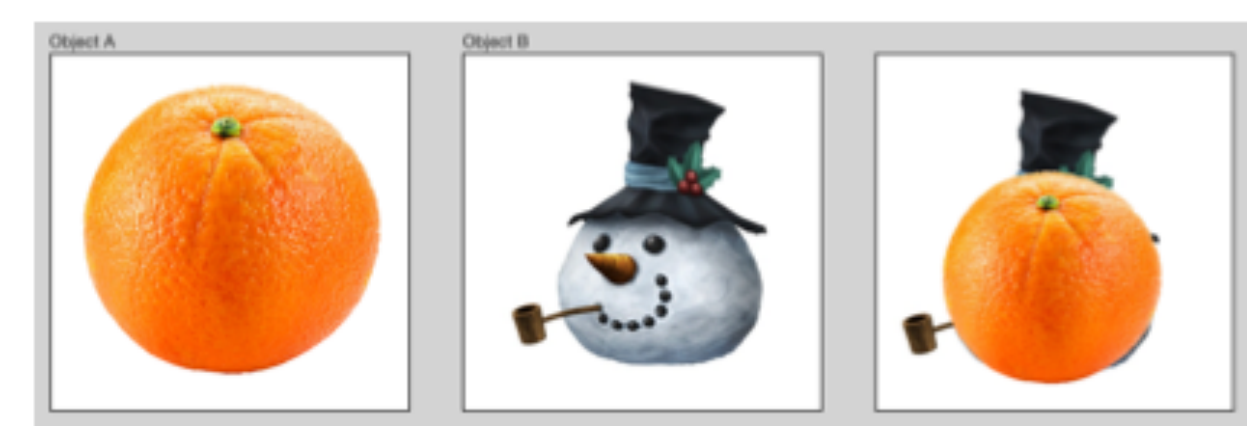
- 2 options to blend silhouette
- 5 options for color blending (only 4 are shown in the figure)
- a tool to select and re-apply internal details.

Each step builds on the selected output from the previous step. The end of the iteration is highlighted by the green border on the far right.

Step 1. Extract main shapes



Step 2. Align objects and adjust positioning



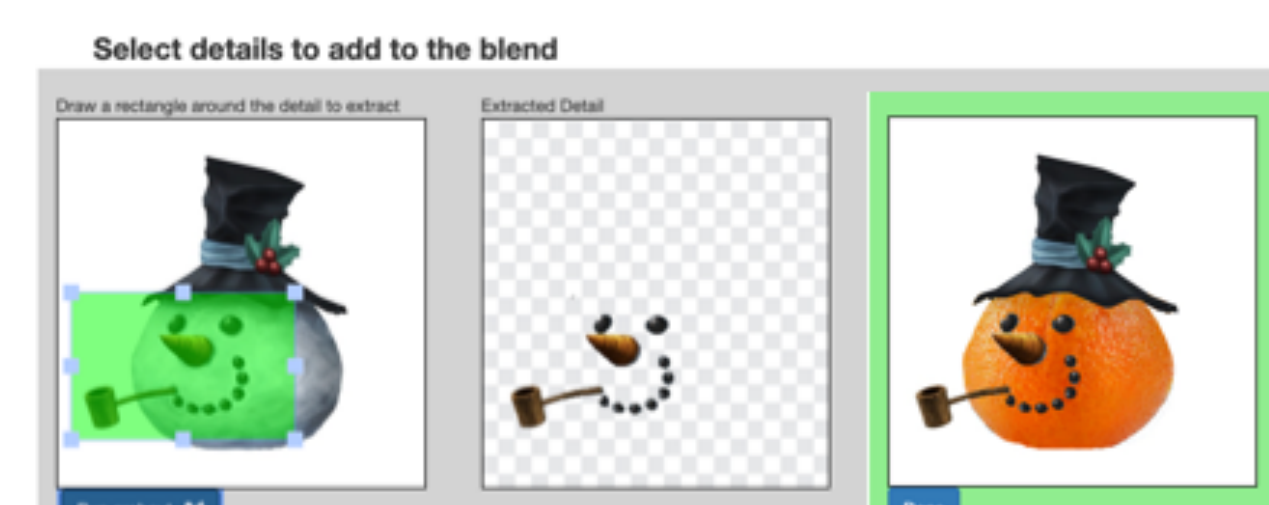
Step 3. Select a silhouette option



Step 4. Select and adjust color/texture blend options



Step 5. Select and re-apply internal details to blend



RESULTS

- Using VisiFit, novices can substantially improve 76.1% of blends in under 4 minutes.
- 70.1% of these blends were deemed fit for publication on social media.

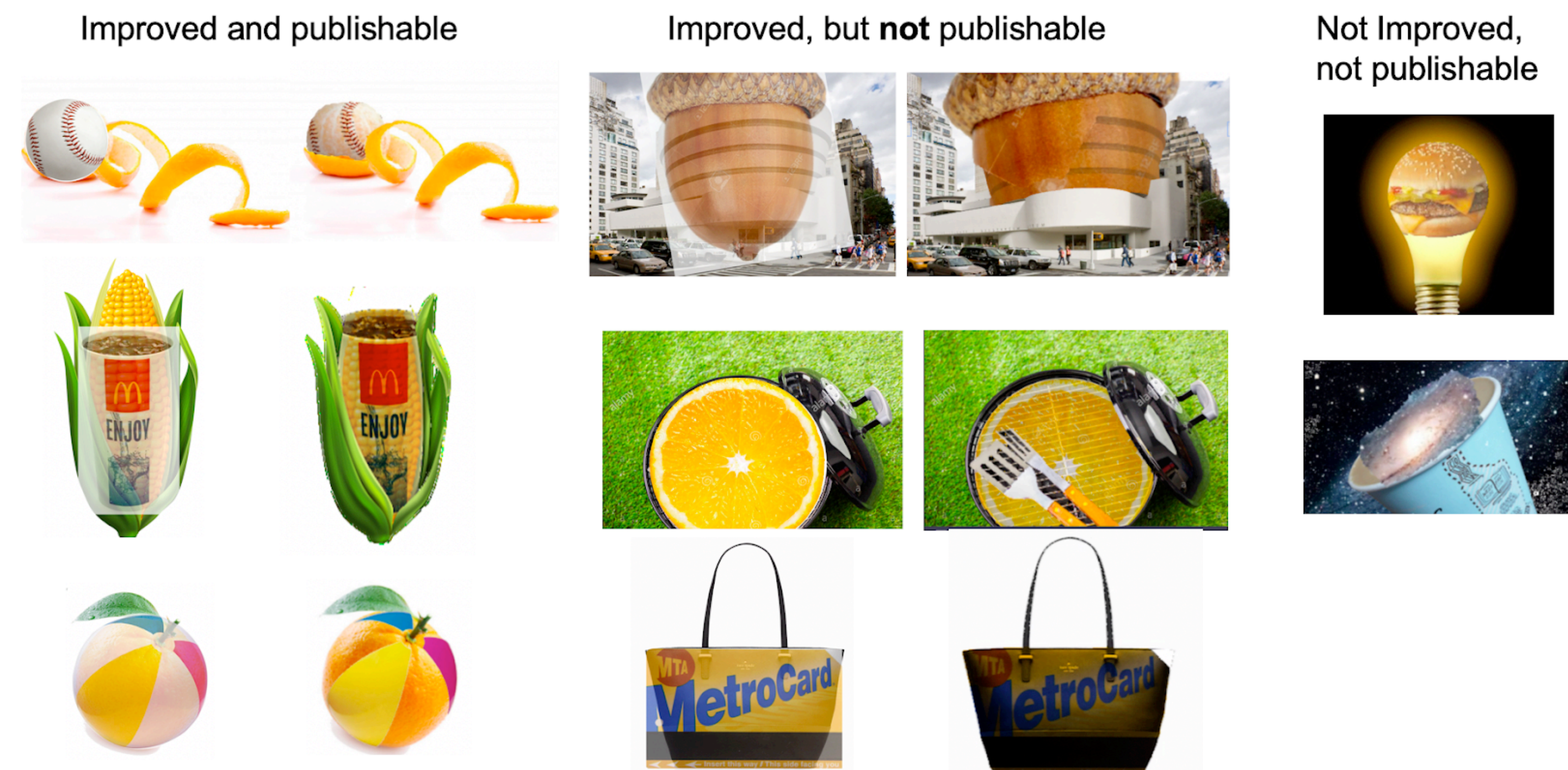


Figure 3. Pairs of initial prototypes and VisiFit-improved prototypes from the VisiFit user study.

CONCLUSIONS

- One of our main contributions is the technique by which we decompose a difficult design task into fundamental dimensions. We coin this technique: fundamental dimension decomposition (FDD)
- We argue in our paper that FDD can be generalized and applied to other domains such as animation and product design.
- We demonstrate VisiFit, system based upon FDD technique and its design principles, showing how novices can quickly produce compelling results through structured iteration.

FUTURE WORK

- We believe the technique of fundamental dimension decomposition and the design principles behind it can be used to help novices structure iteration for other blending domains.
- A next step would be to structure the iteration of animated blends by decomposing **motion** into fundamental dimensions such as pattern, path, show/hide, speed, acceleration, etc.



Figure 4. We show how FDD can be applied to animation. Above, a static visual blend is iterated into an animated one using the fundamental dimensions of motion that are annotated in red.