Palette-Based Colorization for Vector Icons

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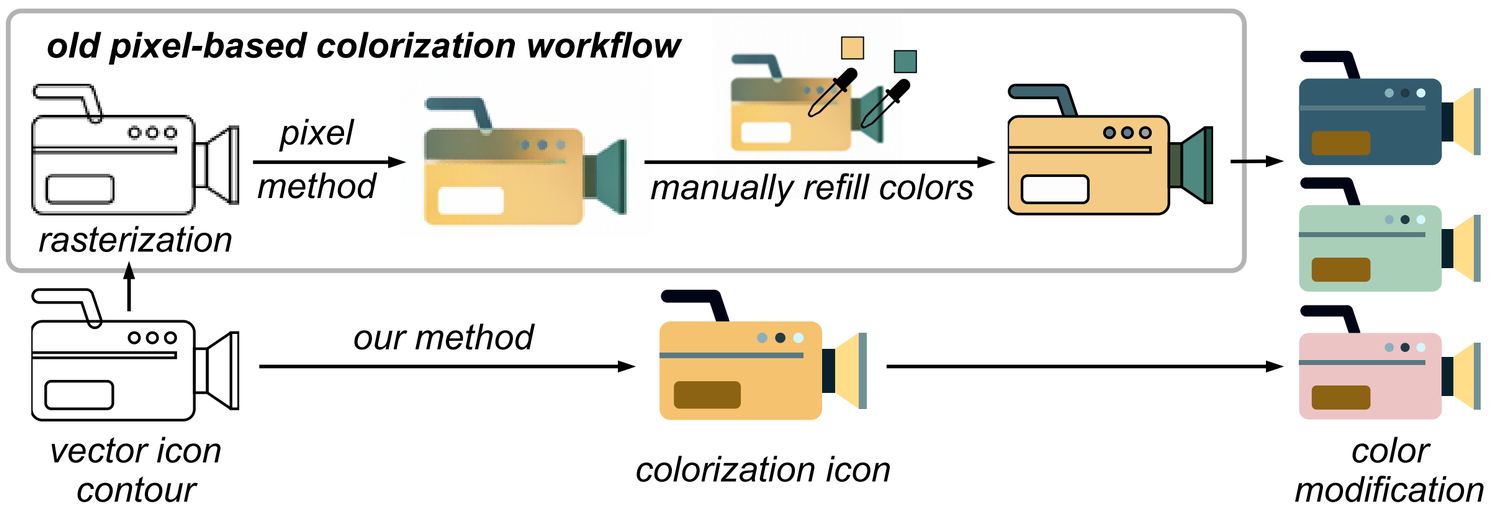
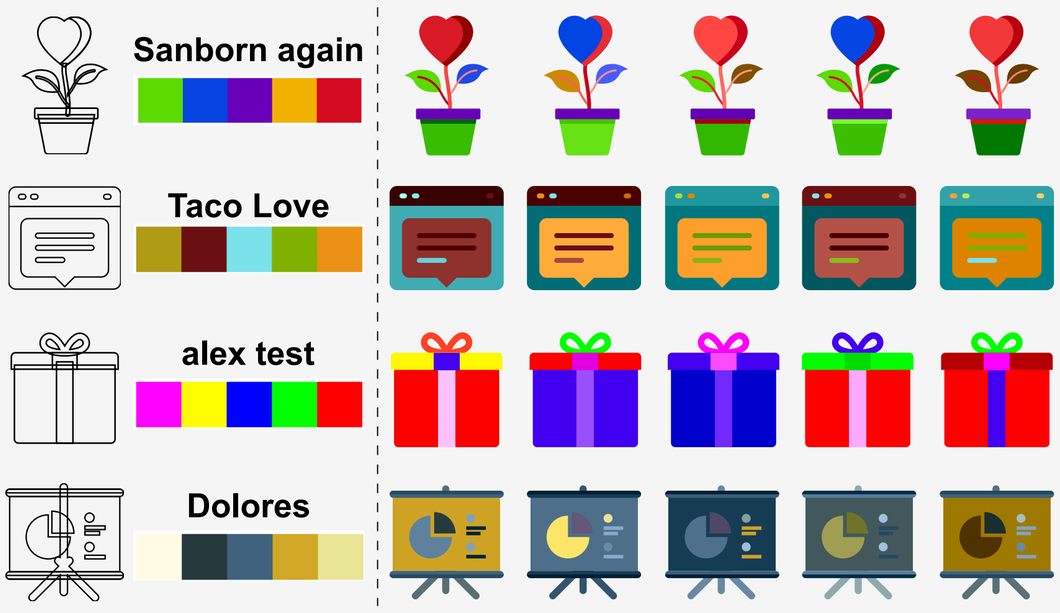
PROBLEM

Coloring is an essential but time-consuming step in icon design. Designers need to consider various constraints and handle each design case-by-case.

Previous icon colorization methods [1,2] are limited to pixel icons and require manual refilling of colors back to the vector contours for further editing. This cannot be seamlessly integrated into the standard icon design workflow.

We propose a rasterization-free vector icon colorization algorithm with two stages: templates generation and palette-based color transfer.

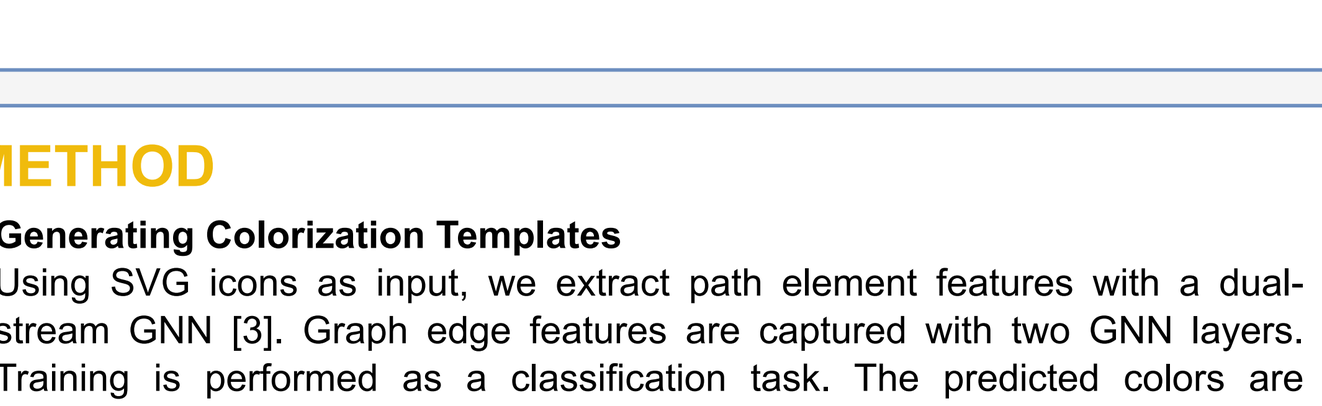




METHOD

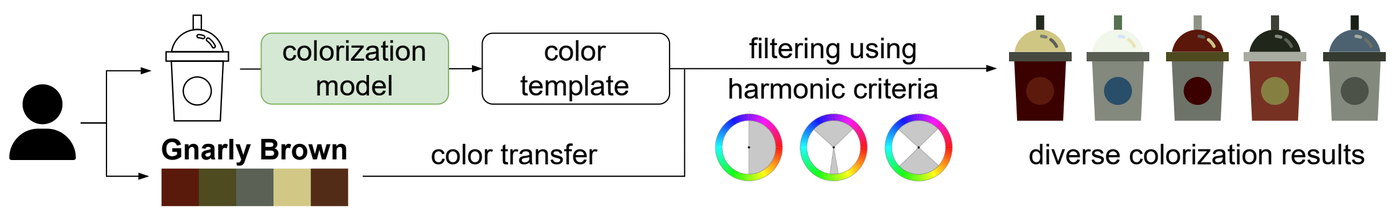
Generating Colorization Templates

Using SVG icons as input, we extract path element features with a dual-stream GNN [3]. Graph edge features are captured with two GNN layers. Training is performed as a classification task. The predicted colors are evaluated using unary and pairwise losses to ensure correctness and relationship between paths. Additionally, two losses control color diversity and harmony for balanced output combinations.



Palette-based Color Transfer

Given an SVG icon contour and a five-color palette, our colorization model will output a color template. Then, we transfer the chroma and luminance according to the selected palette, filter harmonious combinations and provide diverse colorization results.



RESULTS

Our method simplifies the process of colorizing an icon set with multiple color palettes. Designers can quickly identify the optimal palette, reducing the workload in searching suitable color palettes.

Communication between designers and owners is costly and iterative. Regarding this situation, we propose presenting designers with a range of colorization results that can be presented directly to owners for selection. Owners can select their preferred icons from these options to facilitate the elucidation of requirements.

REFERENCES

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