



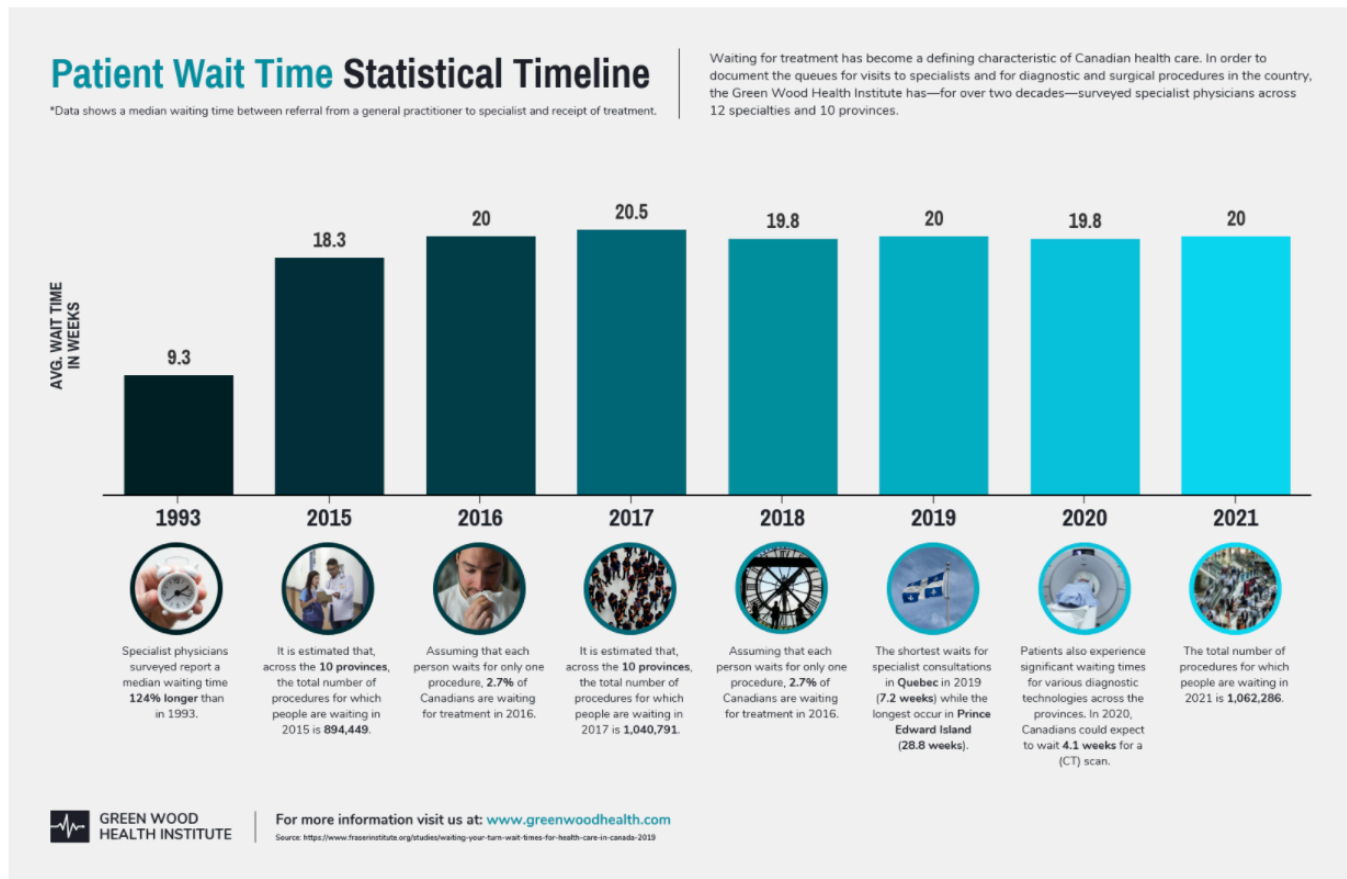
InfoColorizer: Interactive Recommendation of Color Palettes for Infographics

Linping Yuan, Ziqi Zhou, Jian Zhao, Yiqiu Guo, Fan Du, Huamin Qu



Introduction

Infographics

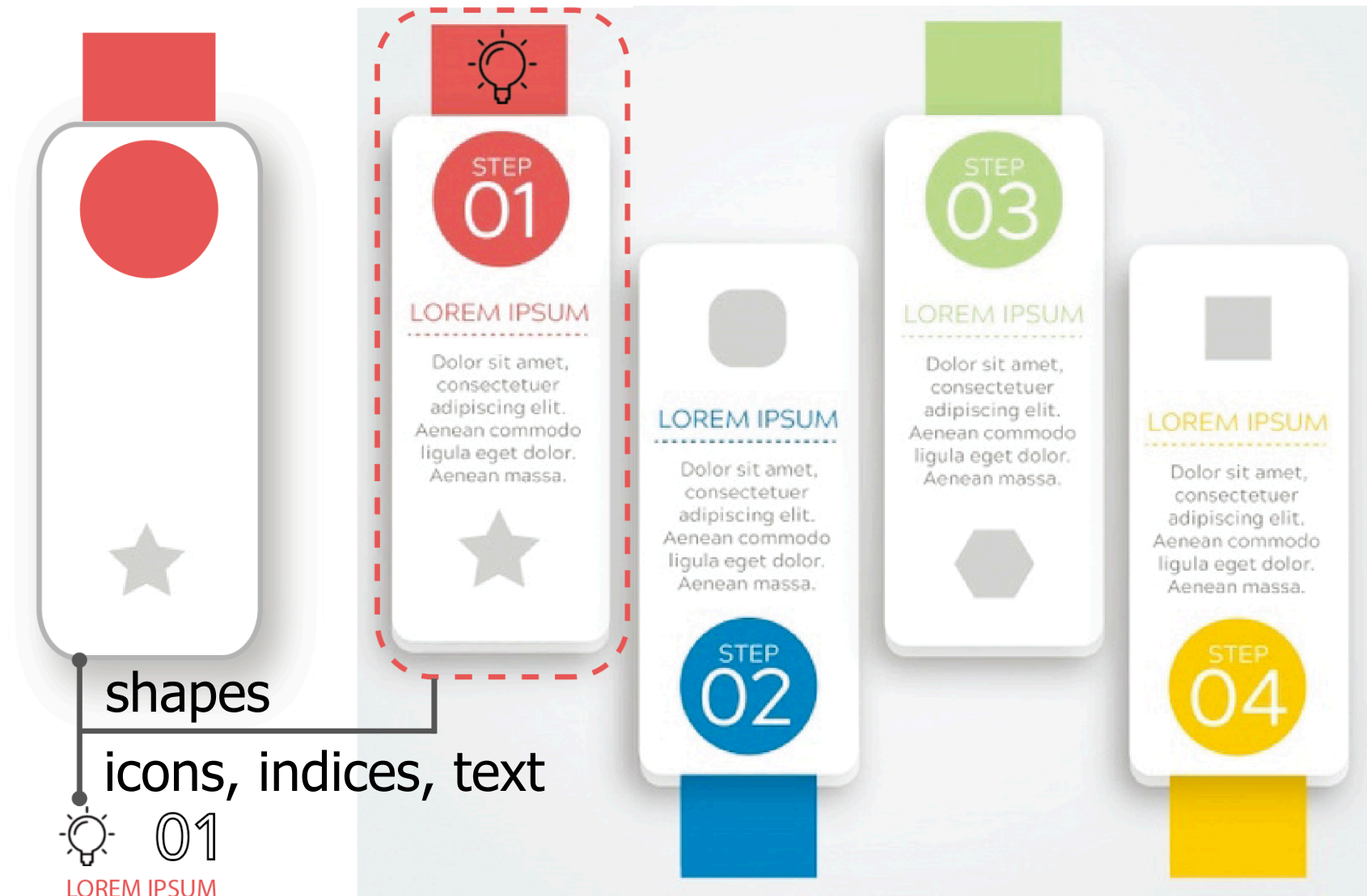


Left: <https://fi.venngage.com/templates/infographics/patient-wait-time-statistical-timeline-76e84d08-7c70-48bc-8cb4-3f6e1a066d58>

Right: <https://visme.co/blog/timeline-infographic-template/>

Introduction

Infographics



Introduction

Color Palette Design

Designing effective color palettes for an infographic needs to consider many factors simultaneously.



spatial layout

semantic
meaning

aesthetics

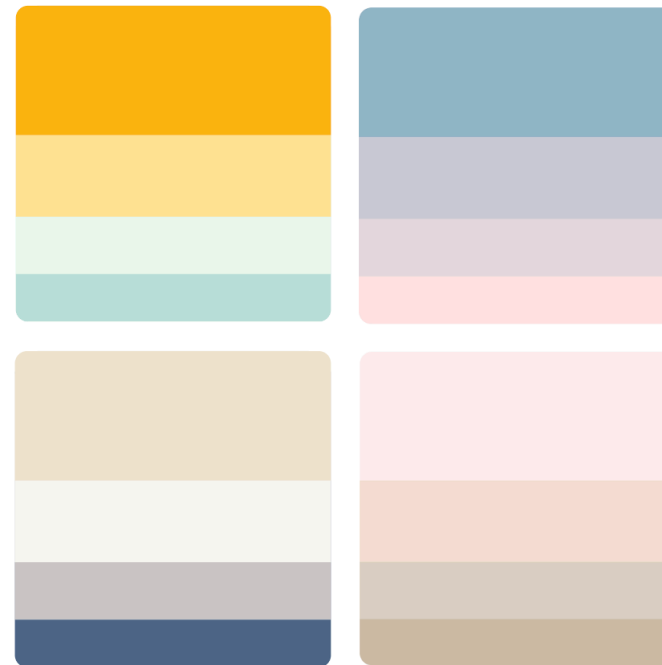
perceptual
effectiveness

Introduction

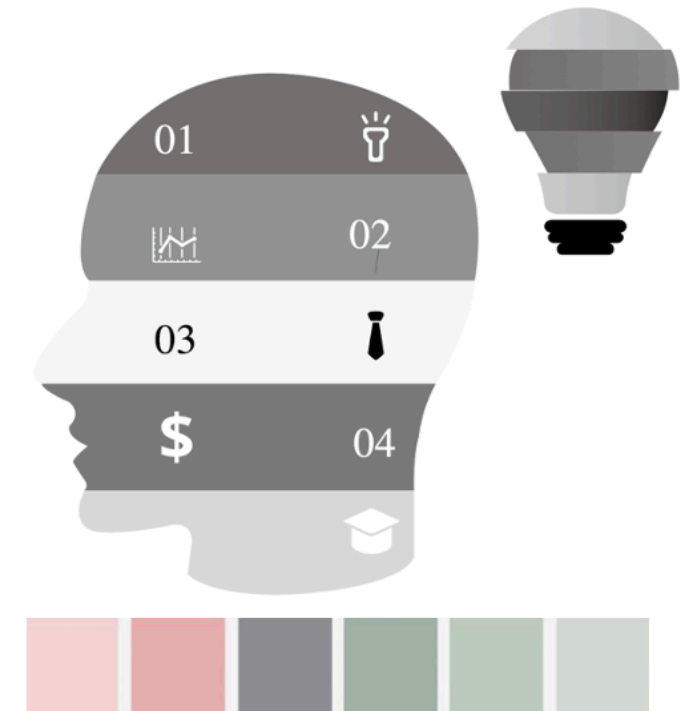
Challenges



Creating a palette from scratch requires users to have relevant expertise.



Using predefined palettes limits users' freedom.



Applying a palette to an infographic is complicated due to the spatial layout of elements.

Introduction

Goals

1

G1: Lower expertise barrier for crafting professional palettes.

2

G2: Incorporate consideration of spatial arrangements of elements.

3

G3: Offer flexibility to embed different kinds of user preferences.

4

G4: Support simple user interactions and iterative design of color palettes.



InfoColorizer

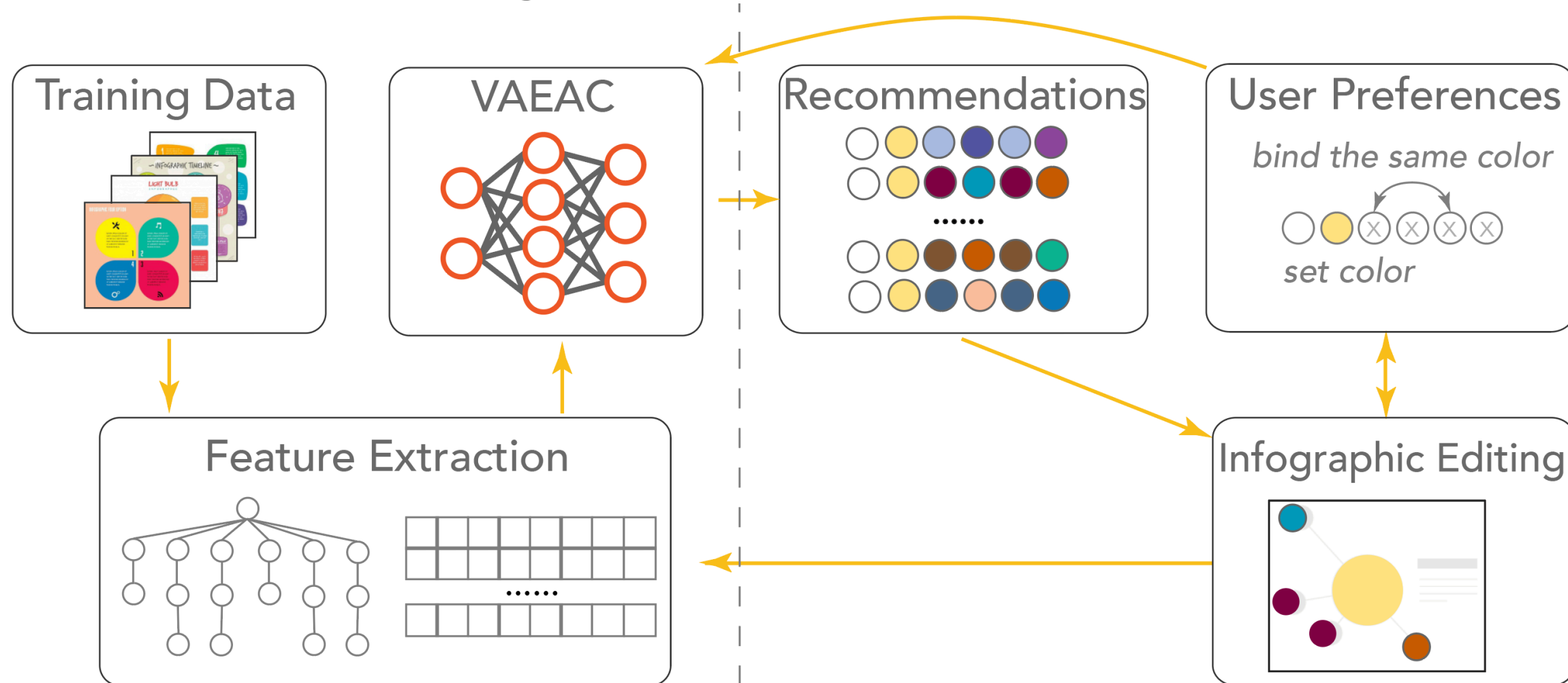
An interactive tool that allows general users to effectively design color palettes during infographic creation, using a data-driven approach.

InfoColorizer

Pipeline

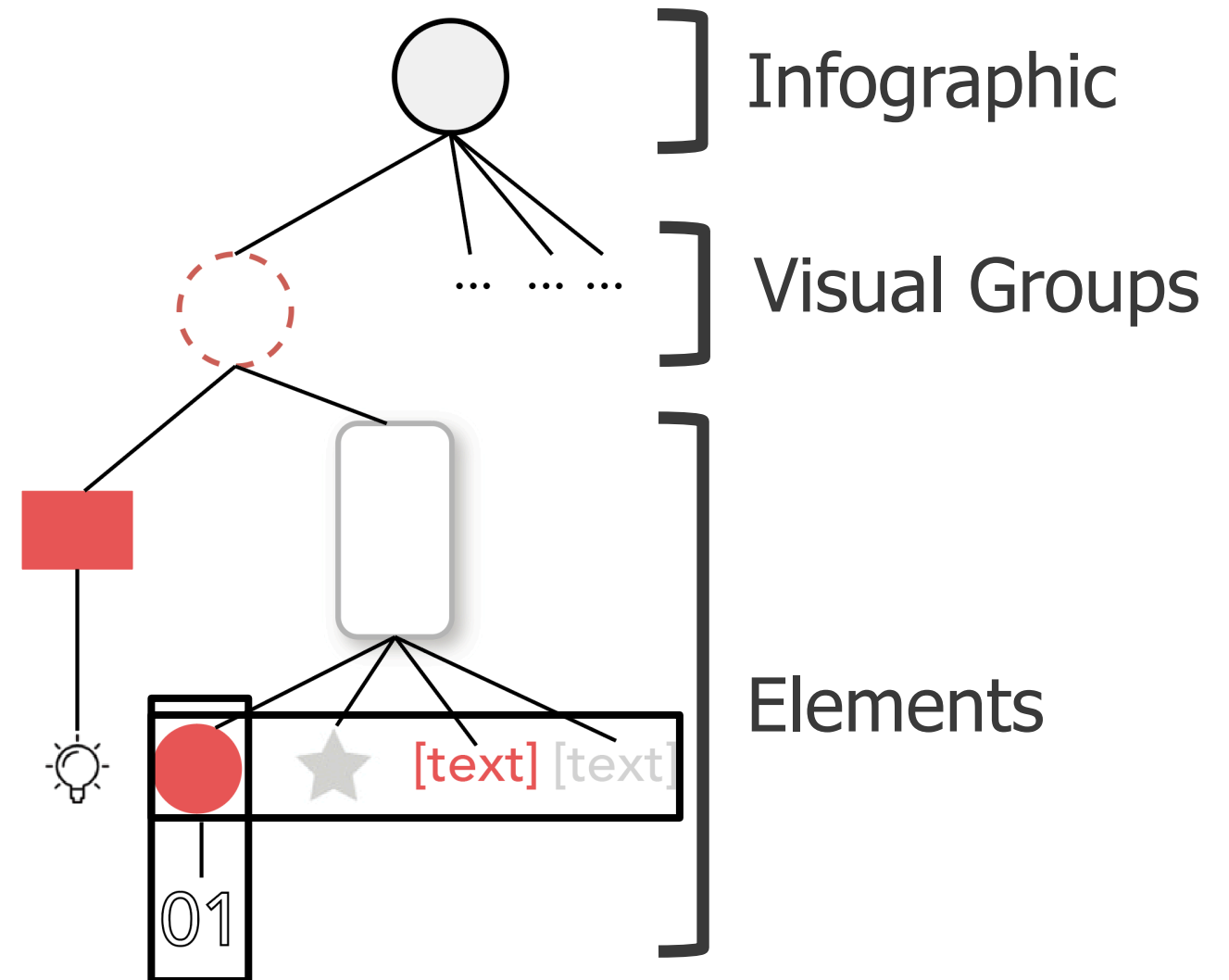
Recommendation Engine

Visual Interface



InfoColorizer

Characterize Infographics with Various Features



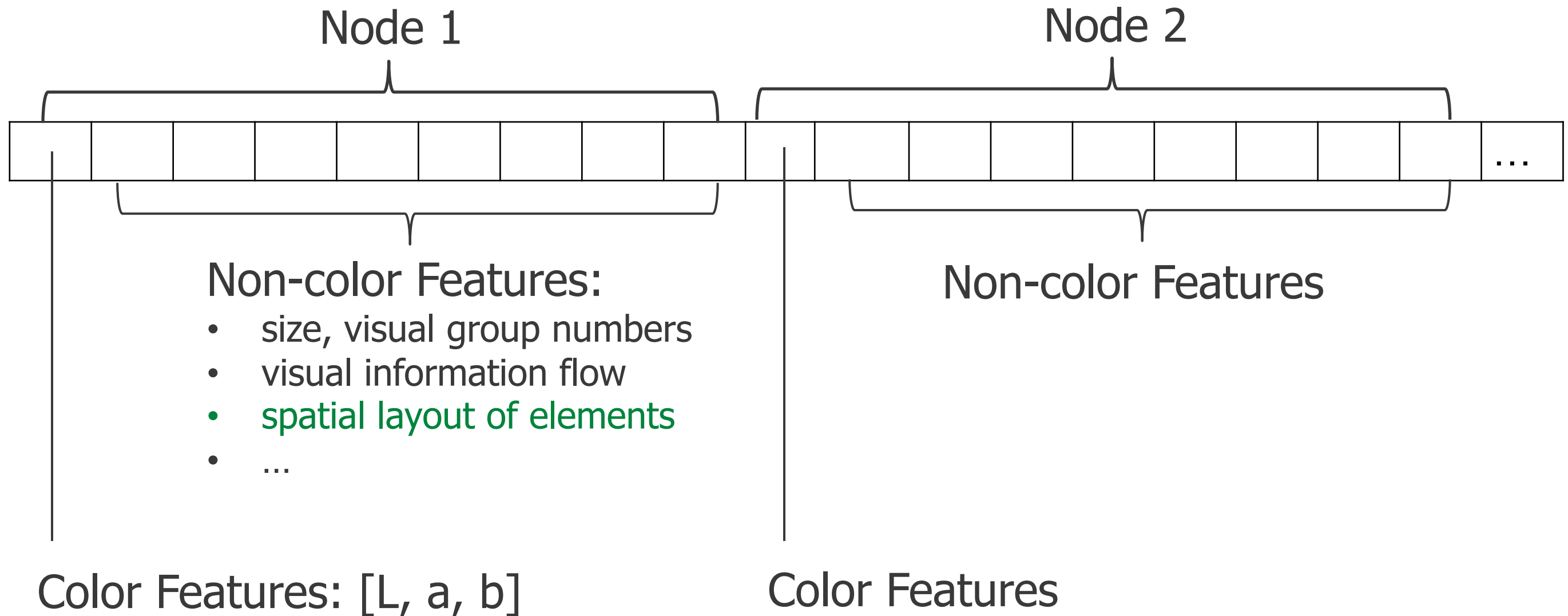
Infographic

Visual Groups

Elements

InfoColorizer

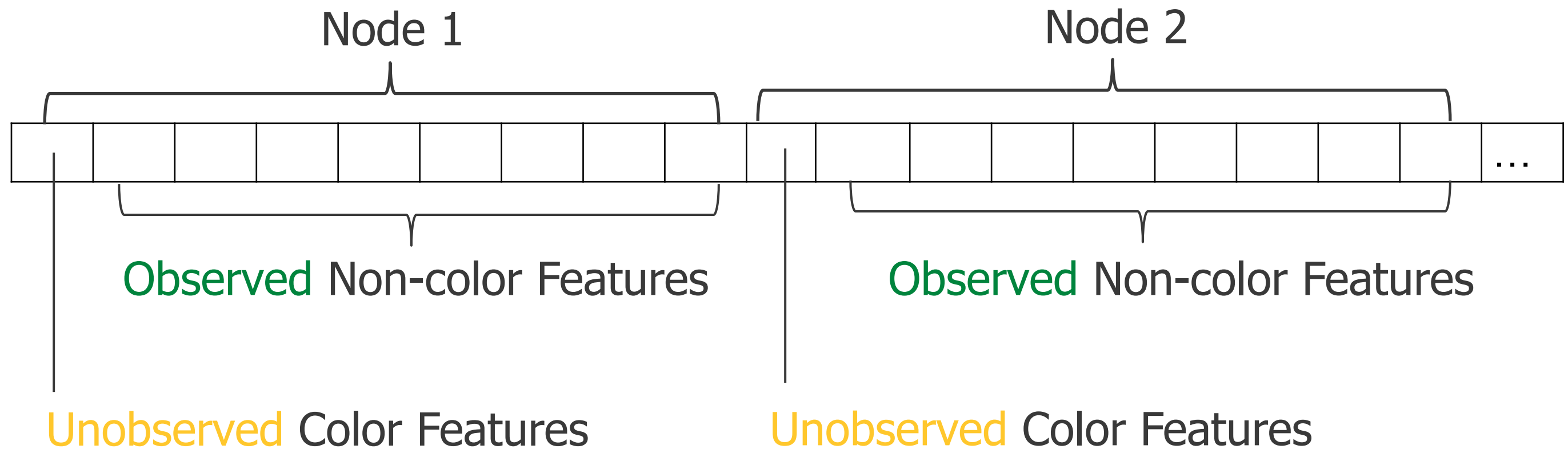
Characterize Infographics with Various Features



InfoColorizer

Lower Expertise Barrier with Recommendation

G2: Consider spatial arrangements of elements.

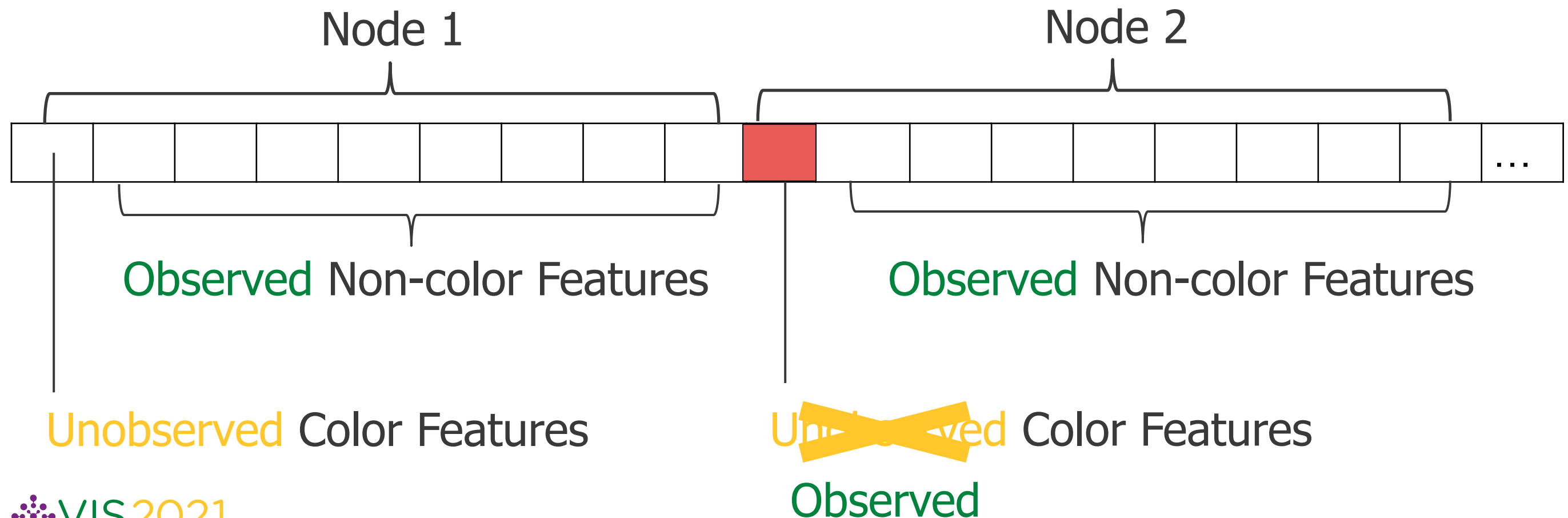


InfoColorizer

Lower Expertise Barrier with Recommendation

G2: Consider spatial arrangements of elements.

G3: Offer flexibility to users for their color preferences.



InfoColorizer

Lower Expertise Barrier with Recommendation

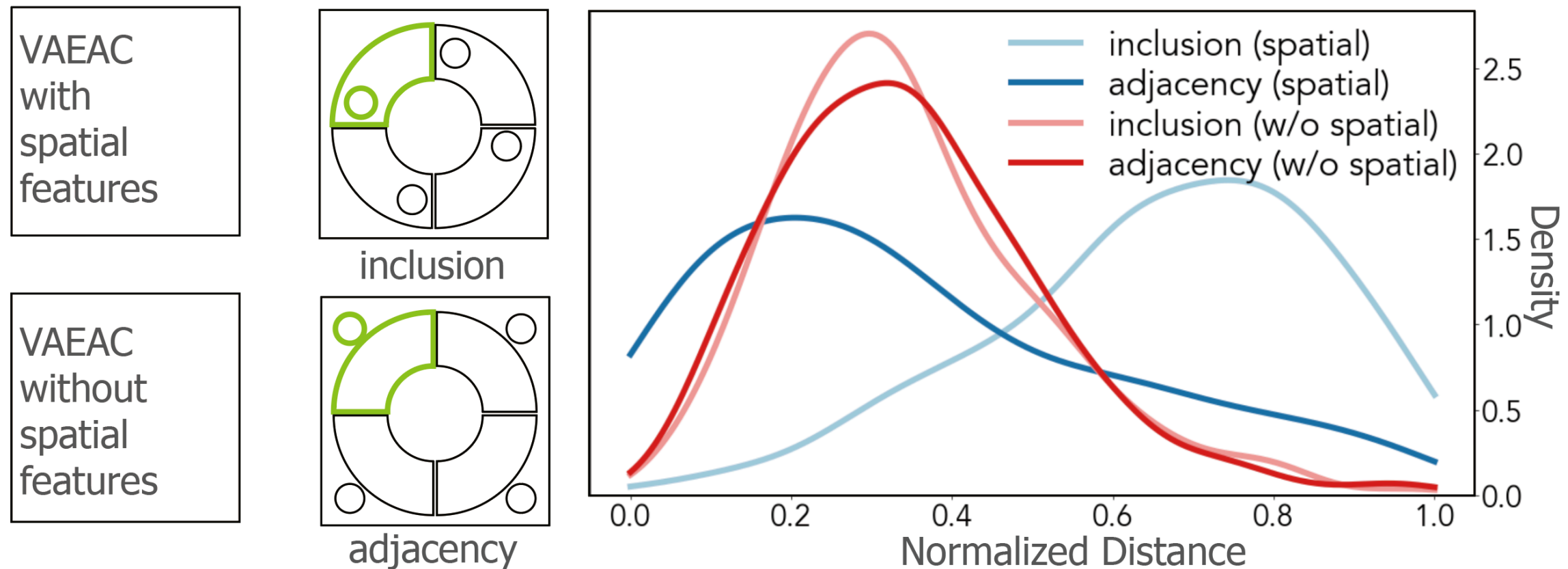
The recommendation process is framed as a conditional generative problem, and three models are considered: VAEAC (Ivanov et al., 2019), GAIN (Yoon et al., 2018), and MICE (Buuren et al., 2011).

	NRMSE	CRS	CVS
VAEAC	0.6543	2.4826	5.6748
GAIN	2.4574	4.1742	4.1075
MICE	15.6098	16.5096	27.6199
VAEAC (non-spatial)	1.1536	3.6874	6.429

InfoColorizer

Lower Expertise Barrier with Recommendation

The idea of the conditional generation behind VAEAC with an example of how spatial arrangements influence the recommended colors:



InfoColorizer

Support User Workflow with Visual Interface

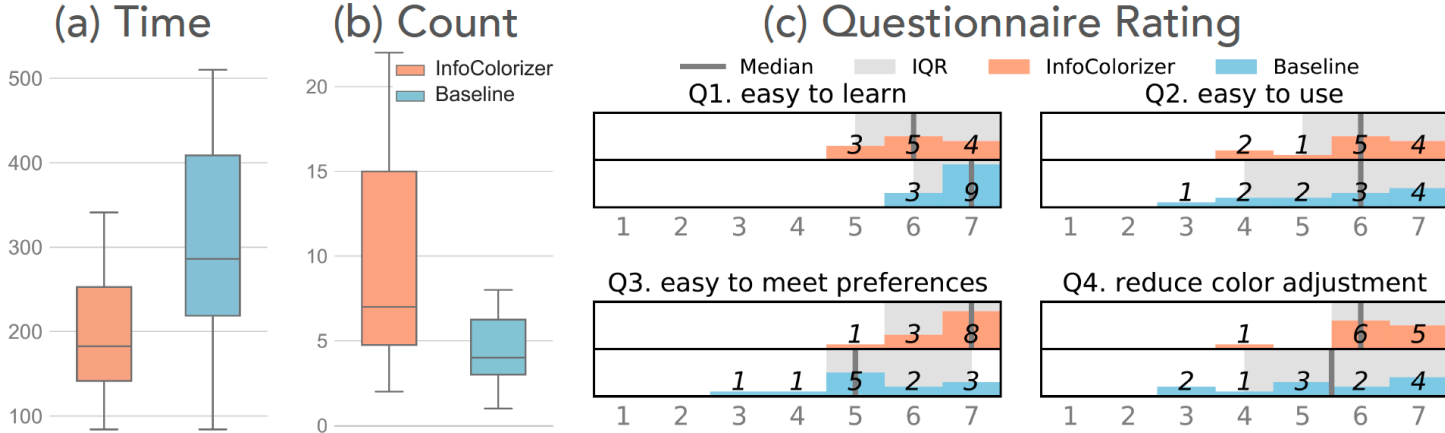
The screenshot displays the InfoColorizer software interface, which is designed to support a user workflow for colorizing infographics. The interface is divided into several key sections:

- Left Panel (A):** A sidebar containing a 'Shapes' menu, 'Icons', 'Images', and 'Templates' sections. A 'Templates' section shows a preview of a bar chart with five bars labeled 01 to 05.
- Top Center:** A toolbar with various editing tools (undo, redo, crop, text, bold, italic, underline, fill, stroke) and a 'light' theme selector.
- Center-Left (B):** A 'Current Result' panel (labeled 6) showing a bar chart with five bars (01-05) in different colors (orange, green, brown, pink, blue) and icons (t-shirt, graduation cap, book, lightbulb, dollar sign).
- Center-Right (1):** A 'Previous Color Preferences' panel (labeled 1) showing a sequence of color swatches (CP1, CP2, CP3) and a 'light' theme indicator. Red dots indicate active preferences.
- Bottom-Left (5):** A 'Previous Result' panel (labeled 5) showing a bar chart with five bars (01-05) in different colors (blue, green, brown, pink, orange).
- Bottom-Right (4):** A 'Previous Recommendations' panel (labeled 4) showing a sequence of color swatches (P1) and a 'light' theme indicator.
- Right Panel (C):** A control panel for 'ANALYZE INFOGRAPHIC' and 'GET RECOMMENDATIONS'. It includes sections for 'Color Preferences' (C1), 'Current Color Preferences' (2), 'Original Colors' (C2), 'Bookmarks' (C3), and 'Recommendations' (C4). The 'Current Color Preferences' section shows a sequence of color swatches with red dots indicating active preferences. The 'Recommendations' section shows a sequence of color swatches with a 'Current Recommendations' section (3) highlighted.

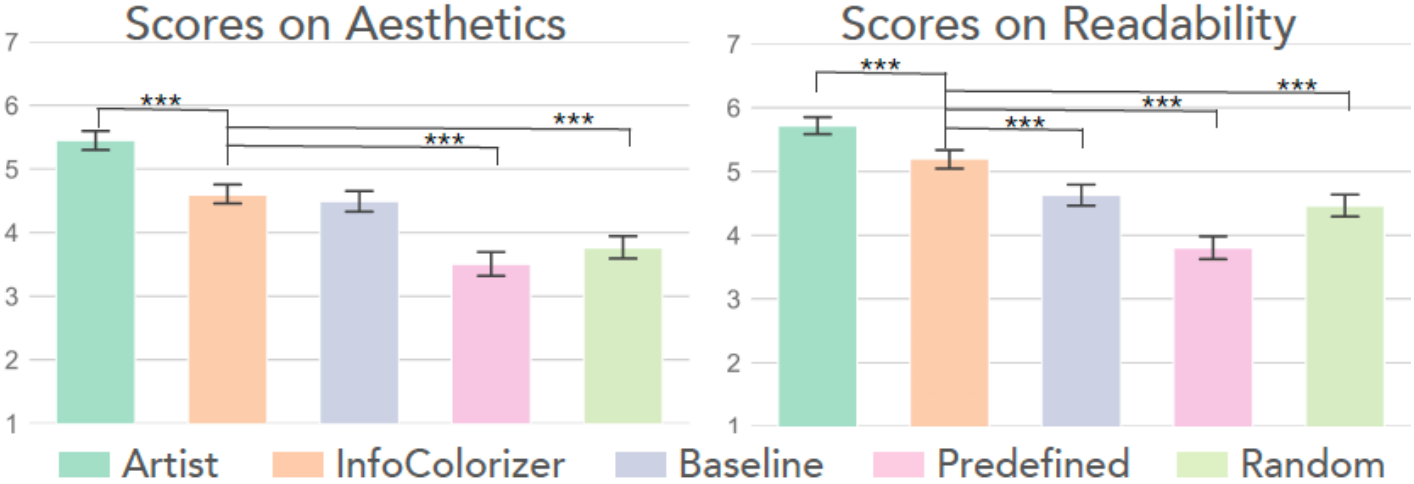
Evaluation

- Case Study
- Controlled User study
 - Novice Creators
- Survey Study
 - Infographic readers
- Interview Study
 - graphical design experts

Results of Controlled User study



Results of Survey Study



Conclusion

Contributions

- A novel data-driven approach that recommends palettes for infographics by leveraging deep learning techniques with the consideration of elements' spatial arrangements, while offering flexibility for user preferences of colors.
- An interactive tool, InfoColorizer, that incorporates the data-driven recommendation and makes it easily accessible and manageable to users, along with the support of iterative design and basic infographic editing.
- Insights and results from a series of evaluations covering case studies, a controlled user study, an online survey, and an interview study.