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VARIANTFLOW: INTERACTIVE STORYLINE VISUALIZATION USING
FORCE DIRECTED LAYOUT

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VARIANTFLOW: INTERACTIVE STORYLINE VISUALIZATION USING
FORCE DIRECTED LAYOUT

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Chapter 1

Abstract

Textual criticism is an active area of research in the digital humanities. Literary scholars study the creation, alteration, and evolution of texts over time and work to reconstruct original texts that have been lost. The process of comparing and analyzing textual variations in different versions of a text is known as collation. Editors assemble the collated text into a critical edition that potentially resembles the original text. Critical edition includes editor's conjectures and collation decisions as footnotes, referred as critical apparatus. Information in the apparatus is of great interest to scholars who seek to improve upon an existing edition or explore and analyze the complex relationships between text versions. Motivated by application to visualization of classical Latin texts, we developed a storyline visualization of the critical apparatus that facilitates guided discovery of hidden patterns, structures, similarities and dissimilarities between text versions and how these phenomena change throughout the text. Storyline visualizations help users understand and analyze the interactions between entities in a story and explore how entity relationships evolve over time. Typical design considerations in existing storyline techniques include minimizing line crossing and line wig-

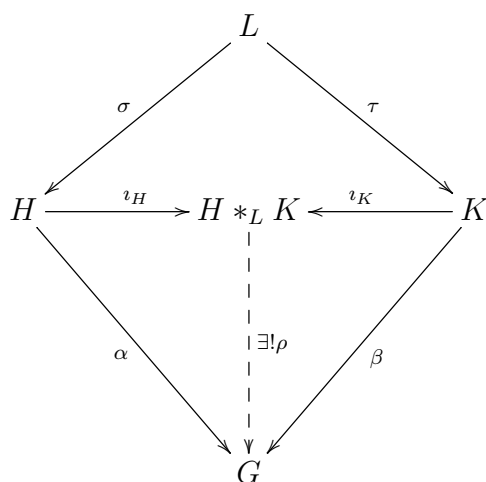
gling, which are computationally intense problems. Generating storyline layouts in real time is a substantial challenge to interactive visualization. In this paper we present a prototype force directed layout algorithm that dynamically reflows storyline layouts for best effort response to external interaction. We conducted an initial user study to evaluate the legibility of our storyline layout after convergence. The evaluation results demonstrated that most users could accurately complete a wide variety of visual metaphor interpretation, reading, and pattern recognition tasks within 20 seconds.

Chapter 2

Introduction

In this thesis, we consider problems concerning

If G is a countable group and $\mathcal{H}$ is a collection of subgroups of G , the notion of *relative hyperbolicity* for the pair $(G, \mathcal{H})$ has been defined by different authors [?, ?, ?, ?, ?, ?, ?, ?]. All these definitions are equivalent when



2.1 Main Results and Applications

The main results are

2.1.1 Examples of Relatively Hyperbolic Groups

Theorem 2.1 (S.M. Gersten [?] - B. Bowditch [?]). *Let H be a quasiconvex subgroup of a word-hyperbolic group G . Suppose $|gHg^{-1} \cap H|$ is finite whenever $g \notin H$. Then G is relatively hyperbolic with respect to $\{H_i\}_{i=1}^m$.*

Let $F_2(a, b)$ be (see Figure ??).

DEDICATION

to

My parents

Luis Eduardo Martinez Villarraga, and

Esperanza Pedroza Paipa

For

Encouraging me to follow my dreams