## Results

- Experts concerned with usability, but novices had 95% accuracy rate on the exercises
- Minor issues with glyph cultural expectations
- Size coding caused minor selection issues
- Analysts excited about using the tool, especially to find missing values

## Criticisms

- Saliency map assumes we a priori know what transaction patterns are interesting
- Unfilled knots draw the eye to faulty data
- Seller names and details only visible through interaction, arduous to examine several knots
- Knots on a row implies continuity, but may be from several sellers

## Problems

- Not enough focus/zooming
- One specific buyer or seller may collude
- Mostly overview, hard to drill down to details

### Previous Approaches

- Aggregate into trends (e.g. sparklines)
- Automated data mining
- Automated clustering and aggregation

### VAET

- Juxtaposed overview + detail
- Introduces new visual encoding: Knotlines

### Detail View: Knotlines

- Novel visual encoding based on sheet music
- Based on three level hierarchy (grouped by seller, by time period then by item category)
- Linked with saliency overview

### Knot Glyph Details

- Interaction and selection of knots provides greater detail
- Related knots shown with grey highlights

### Knot Details on Demand

- Interaction and selection of knots provides greater detail
- Related knots shown with grey highlights

### Validation of the Tool

- Informal walkthrough case study with expert analysts
- Full user study, two analysts, eight novice users
- Variety of exercises simulating analyses that would happen in the real world

## Domain: E-Transaction Logs

- Millions of transactions a day (e.g. eBay)
- Many buyers, many sellers, many products
- Analysis used to maximize profits (prevent fraud, improve advertisements)

## Typical Tasks

- Identify time periods and categories of interest
- Identify interesting transactions and drill down
- Identify interesting sellers
- Examine transaction patterns of specific sellers

## Overview through Saliency Map

- Probabilistic decision tree computes interest
- Encode in a dense pixel based layout
- Allow zooming and time selection

## What is a PDT?

- User provides training set of interesting and non-interesting transactions
- Machine learning algo (see paper) computes something similar to a finite state machine
- Probability of TP is function of exp TP and FP

## What is VAET?

- VAET Presents an approach to encoding an overview of transactions through saliency
- Introduces a novel visual encoding of knotlines for detailed time series data
- Provides an effective overview + detail view of E-Transactions
- Could be further improved and customized, but the validation is convincing