Pattern Finding in Point & Interval Event Sequences

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Exploring Temporal Patterns in Electronic Health Record Data

May 23, 2013 Workshop
Interdisciplinary research community
- Computer Science & Info Studies
- Psych, Socio, Poli Sci & MITH

(www.cs.umd.edu/hcil)
# Patient Histories: Our Research

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<tr>
<th>Tool</th>
<th>Event Types</th>
<th>Records</th>
<th>Display</th>
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<tbody>
<tr>
<td>LifeLines</td>
<td>Points, Intervals</td>
<td>One</td>
<td>Individual</td>
</tr>
<tr>
<td>LifeLines2</td>
<td>Points</td>
<td>Many</td>
<td>Individual, Summary</td>
</tr>
<tr>
<td>Similan</td>
<td>Points</td>
<td>Many</td>
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<tr>
<td>LifeFlow</td>
<td>Points</td>
<td>Many</td>
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</table>
LifeLines: Patient Histories

www.cs.umd.edu/hcil/lifelines
LifeLines2: Align-Rank-Filter & Summarize

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LifeLines2: Align-Rank-Filter & Summarize

www.cs.umd.edu/hcil/lifelines2
Similan: Search

www.cs.umd.edu/hcil/similan
LifeFlow: Aggregation Strategy

Temporal Categorical Data (4 records)

LifeLines2 format

Tree of Event Sequences

LifeFlow Aggregation

www.cs.umd.edu/hcil/lifeflow
LifeFlow: Interface with User Controls

Control Panel

Horizontal Zoom

Alignment Control

Legend

Tallest bar at the end = Most frequent pattern

Time to root

Time to previous event

Legend
EventFlow: Original Dataset
LABA_ICs Merged
SABAs Merged
Align by First LABAICS
Reduce Window Size
Overview + Details
Current Directions

- Motif Simplifications: Find & Replace
- Query Features
  - Menus & Graphical Query
  - Absence for Points & Intervals
  - Flexible Temporal Patterns
- Scalability
  - Event types, Events, Records, Query complexity
  - LP Algorithm
- Long-term Case Studies
30th Annual Symposium
May 22-23, 2013

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