Automatic Extraction of References Between Text and Tables

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Motivation

Problem: Difficulty of reading papers with complicated text-chart relationships

- ReVision [Savva et al. 2011]
  - Chart type classification
  - No references between text & charts
- Crowdsourcing [Kong et al. 2014]
  - Text-chart cross-reference extraction
  - Not scalable

Missing Piece: Generalizable automated techniques for text-chart cross-referencing

End Goal

- Intelligent interactive paper reading tool

Our Approach

- PDF -> HTML / Table Extraction
- Table Extraction Automation
- HTML -> PDF (+Interactivity)
- Annotation Automation (NLP)
- Paper Reading Tool

Timeline

Current

UI for Annotation

Data Collection (Crowdsourcing)

Annotation Automation (NLP)

Key Challenges

- Generalized table extraction
- Characterization of cross-references
- Quality crowdsourced data
- Annotation automation via NLP

User Interface

Drone and Me: An Exploration Into Natural Human-Drone Interaction

<table>
<thead>
<tr>
<th>Task</th>
<th>Reference</th>
<th>Gesture</th>
<th>Sound</th>
<th>Body</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>200 ppm</td>
<td>85%</td>
<td>90%</td>
<td>85%</td>
</tr>
<tr>
<td>200 ppm</td>
<td>85%</td>
<td>90%</td>
<td>85%</td>
<td>85%</td>
</tr>
</tbody>
</table>

Upload your annotated results

Demo: http://sherryruan.net/portfolio/text-chart-ref/