Personal Health Knowledge Graphs for Patients

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Workshop – Personal Health Knowledge Graphs (PHKG2020)
The Knowledge Graph Conference

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Knowledge Graphs (KGs)

- Background of Knowledge Graphs

*From Craig Knoblock, AAAI 2018 Tutorial Building Knowledge Graphs*
Knowledge Graphs (KGs)

- Background of Knowledge Graphs
- Limitations

Example:

<table>
<thead>
<tr>
<th>Name</th>
<th>Weight</th>
<th>Height</th>
<th>Diabetic?</th>
<th>Insulin dosage (units of insulin/day)</th>
<th>Fav Cuisine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fred</td>
<td>220lbs</td>
<td>5’8”</td>
<td>Yes</td>
<td>50</td>
<td>Asian</td>
</tr>
<tr>
<td>Michael</td>
<td>295</td>
<td>6.0”</td>
<td>Yes</td>
<td>54</td>
<td>American</td>
</tr>
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Knowledge Graphs (KGs)

• Background of Knowledge Graphs
• Limitations
• Personal Knowledge Graph
  • Contextual, Personal, Topical
  • Medical, social, behavioral, lifestyle information
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**Query:** What is in the lunch menu at my favorite Asian restaurant

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Research challenges - PHKG
Design and Implementation Challenges

• Brute Force Approach
  • Creating Ontologies on the fly
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Knowledge Graph

Need patient – specific health data!
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Knowledge Graph
Design and Implementation Challenges

- Brute Force Approach
  - Creating Ontologies on the fly

- Segregating PHKGs from KGs
Design and Implementation Challenges

• Brute Force Approach
  • Creating Ontologies on the fly

• Segregating PHKGs from KGs
  • Privacy Concerns
Design and Implementation Challenges

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• Segregating PHKGs from KGs
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• Data Collection
  • Public platforms
    • Consistency and Integrity
Design and Implementation Challenges

- Brute Force Approach
  - Creating Ontologies on the fly

- Segregating PHKGs from KGs
  - Privacy Concerns

- Data Collection
  - Public platforms
  - Consistency and Integrity

- Other
  - Computing Resources, validation mechanisms, ...
Questions